

## PATENT ASSIGNMENT

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SUBMISSION TYPE:	NEW ASSIGNMENT										
NATURE OF CONVEYANCE:	ASSIGNMENT										
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RECEIVING PARTY DATA											
<table border="1"> <tr> <td>Name:</td> <td>Power &amp; Data Corporation Pty Ltd.</td> </tr> <tr> <td>Street Address:</td> <td>Level 4, 364 Kent Street</td> </tr> <tr> <td>City:</td> <td>Sydney, New South Wales</td> </tr> <tr> <td>State/Country:</td> <td>AUSTRALIA</td> </tr> <tr> <td>Postal Code:</td> <td>2000</td> </tr> </table>		Name:	Power & Data Corporation Pty Ltd.	Street Address:	Level 4, 364 Kent Street	City:	Sydney, New South Wales	State/Country:	AUSTRALIA	Postal Code:	2000
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PROPERTY NUMBERS Total: 1											
<table border="1"> <thead> <tr> <th>Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Patent Number:</td> <td>7585175</td> </tr> </tbody> </table>		Property Type	Number	Patent Number:	7585175						
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CORRESPONDENCE DATA											
Fax Number:	(202)626-1700										
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<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.</i>											
Correspondent Name:	Leland Gardner										
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ATTORNEY DOCKET NUMBER:	013093-0001-999										
NAME OF SUBMITTER:	Leland I. Gardner										
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1 of 1 DOCUMENT: Unreported Judgments NSW

281 Paragraphs

**HIGGINS v SINCLAIR - BC201101491**

Supreme Court of New South Wales  
Johnson J

2009/297946

31 January, 1-4, 7, 8 February, 18 March 2011

Higgins and Ors v Sinclair [2011] NSWSC 163

**DEFAMATION -- Misleading and deceptive conduct -- Publications on internet and by email -- Defamatory statements concerning individual Plaintiffs -- Defence of substantial truth -- Defence not established -- assessment of damages for defamation -- Claim by corporate Plaintiff for relief under Fair Trading Act 1987 -- Whether representations misleading and deceptive -- Whether made in trade or commerce -- Whether injunctive and declaratory relief appropriate.**

(NSW) Fair Trading Act 1987

(NSW) Defamation Act 2005

(NSW) Evidence Act 1995

(CTH) Competition and Consumer Act 2010

(NSW) Uniform Civil Procedure Rules 2005

*Dow Jones & Co Inc v Gutnick* [2002] HCA 56 ; 210 CLR 575; *Gardener v Nationwide News Pty Ltd* [2007] NSWCA 10; *Farquhar v Bottom* [1980] 2 NSWLR 380; *Amalgamated Television Services Pty Ltd v Marsden* (1998) 43 NSWLR 158; *Haddon v Forsyth* [2011] NSWSC 123; *Howden v Truth & Sportsman Ltd* [1937] HCA 74 ; 58 CLR 416; *Sutherland v Stopes* [1925] AC 47; *Greek Herald Pty Ltd v Nikolopoulos* [2002] NSWCA 41 ; 54 NSWLR 165; *Amalgamated Television Services Pty Ltd v Marsden* [2002] NSWCA 419; *Palmer v Dolman* [2005] NSWCA 361; *Sydney South West Area Health Service v Stamoulis* [2009] NSWCA 153; *JMVB Enterprises Pty Ltd v Camoflag Pty Ltd* [2005] FCA 1474 ; 67 IPR 18; *Taco Co of Australia Inc v Taco Bell Pty Ltd* (1982) 42 ALR 177; *Hornsby Building Information Centre Pty Ltd v Sydney Building Information Centre Ltd* [1978] HCA 11 ; 140 CLR 216; *Butcher v Lachlan Elder Real Estate Pty Ltd* [2004] HCA 60 ; 218 CLR 592; *Equity Access Pty Ltd v Westpac Banking Corporation* (1989) 16 IPR 431; *Parkdale Custom Built Furniture Pty Ltd v Puxu Pty Ltd* [1982] HCA 44 ; 149 CLR 191; *Plimer v Roberts* (1997) 80 FCR 303; *Shahid v Australasian College of Dermatologists* [2008] FCAFC 72 ; 168 FCR 46; *Palmer Bruyn & Parker Pty Ltd v Parsons* [2001] HCA 69 ; 208 CLR 388; *Huyn v Tang* (District Court of New South Wales, 2003); *Zarth v Williamson* [2006] NSWCA 246; *Trantum v McDowell* [2007] NSWCA 138; *SMEC Holdings Ltd v Boniface* [2007] NSWSC 140; *Martin v Bruce* [2007] NSWDC 297; *Holmes v Fraser* [2008] NSWSC 570; *Fraser v Holmes* [2009] NSWCA 36; *PK v BV (No 2)* [2008] NSWDC 297; *Webster v Coles Myer Ltd*; *Thompson v Coles Myer Ltd* [2009] NSWDC 4; *Ryan v Premachandran* [2009] NSWSC 1186; *Australian Broadcasting Commission v O'Neill* [2006] HCA 46 ; 227 CLR 57; *Hatfield v TCN Channel 9* [2010] NSWCA 69; *Carson v John Fairfax & Sons Ltd* [1993] HCA 31 ; 178 CLR 44, cited

Colin Bodkin, "Patent Law in Australia", Law Book Company, 2008

Johnson J.

**PATENT****REEL: 028004 FRAME: 0110**

[1] By Further Amended Statement of Claim filed 8 December 2010, the Plaintiffs claim against the Defendant in defamation and under the Fair Trading Act 1987 ( "FT Act" ).

[2] The First Plaintiff, Peter Gordon Higgins, and the Second Plaintiff, John Randall Sharp, are both directors of the Third Plaintiff, Power & Data Corporation Pty Ltd ("PDC" ). The Plaintiffs allege that the Defendant, John Ashton Sinclair, published defamatory material on a website in August 2009. The Plaintiffs allege that the Defendant also engaged in misleading and deceptive conduct under the FT Act in the form of emails sent by him in July 2010.

[3] The Plaintiffs contend that these publications carried a number of serious imputations and misrepresentations giving rise to claims in defamation and under the FT Act.

[4] The Third Plaintiff, a corporation, has no cause of action for defamation: s 9 Defamation Act 2005 . PDC's claim is limited to relief under the FT Act.

### **The Hearing**

[5] Neither the Plaintiffs nor the Defendant elected for the proceedings to be tried by jury, so the hearing proceeded by way of Judge-alone trial: s 21 Defamation Act 2005.

[6] The Plaintiffs were represented at the hearing by Mr Smark SC and Ms Chrysanthou of counsel.

[7] The Defendant was unrepresented. At the commencement of the hearing, I acceded to an application by the Defendant that a friend of his, Mr Michael Gallen (who is not legally qualified), sit with him at the bar table and assist him during the course of the hearing. Mr Gallen fulfilled this function throughout the seven-day hearing which proceeded between 31 January 2011 and 8 February 2011.

[8] At various points in the proceedings, I sought to explain to the Defendant the nature of the hearing and its phases, including evidence and submissions, to assist the progress of the hearing. In the course of the hearing, I became aware that the Defendant did not have the transcript of the proceedings. I took the view that the court would be assisted in the determination of the proceedings if the Defendant had a copy of the daily transcript, and that this course would also serve the interests of justice. A copy of the transcript was provided to the Defendant, and was available to him before he came to give evidence and make submissions.

[9] In addition, I determined that whatever the strict procedure ought to have been, it was appropriate that Mr Smark SC address first by way of closing submissions so that the Defendant would understand the legal and factual issues raised by the Plaintiffs. Detailed written submissions were prepared by counsel for the Plaintiffs and provided to the court and the Defendant on 7 February 2011 (T460-461), the day before closing submissions were made (T475ff).

[10] The following witnesses gave oral evidence in the Plaintiffs' case at the hearing:

- (a) John Bernard Redfern, Patent Attorney (T45-76; T328-348);
- (b) Ross David Andrews, Chief Engineer at PDC (T77-200);
- (c) Colin Grantham, Consultant Electrical Engineer (T201-227);
- (d) Noel Carmody, Consultant Electrical Engineer (T230-255);
- (e) John Randall Sharp, the Second Plaintiff (T256-279);
- (f) Peter Gordon Higgins, the First Plaintiff (T279-315).

[11] In addition, the Plaintiffs relied upon the affidavit of Phillip Krull and statements of Robert James Webster and Mitchell O'Neil Taylor (Exs DD and EE respectively) with respect to extent of publication and also the reputations of the First and Second Plaintiffs. Messrs Krull, Webster and Taylor were not required for cross-examination.

[12] The Defendant gave evidence in his case (T349-459). He called no other witnesses.

[13] In addition to the oral evidence, a range of documents and objects were tendered by the parties.

### **The Parties and the Issues in the Proceedings**

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**REEL: 028004 FRAME: 0111**

**[14]** The First Plaintiff, Mr Higgins, founded PDC in 2003 and remains a director and shareholder of that company. He was also one of the founders of Mortgage Choice, a large mortgage broker.

**[15]** The Second Plaintiff, Mr Sharp, was previously a member of the House of Representatives and a Minister in the Howard Government between 1996 and 1998. He retired from Parliament in 1998. Mr Sharp invested in PDC in 2003 and became a director and shareholder in PDC in 2004.

**[16]** The Defendant, Mr Sinclair, was one of the inventors of an electrical conductor system now marketed and sold by PDC under the name "Mainline" (hereinafter "Mainline system" or "Mainline product" ). Put simply, the Mainline system permits the replacing of conventional power points with a power track into which movable power sockets (called adaptors) could be fitted at whatever points on the track the user desires.

**[17]** Reference will be made later, in the course of factual findings, to events between 2002 and 2010 which are relevant to these proceedings.

**[18]** It is sufficient to observe at this point that a provisional patent application was filed in relation to the Mainline system on 18 December 2002 by Power & Communications Logistics Pty Ltd ( "PCL" ), of which the Defendant was then a director. By various documents, PDC acquired rights to the invention, including rights to exploit a patent lodged in respect of it.

**[19]** A standard patent application was filed on 18 December 2003 by PCL and that application was later granted.

**[20]** PDC has now developed the Mainline system to the point where its full-scale commercial exploitation has been taking place since early 2008. The evidence reveals that this process has involved extensive safety testing of the Mainline system, and has resulted in it being certified as complying with applicable standards. The Mainline system is widely marketed in the United Kingdom and in Australia and has also been sold in Europe. It has been installed in Sydney at the University of Sydney, and at various school sites and in other commercial and private premises.

**[21]** The present proceedings were commenced by Statement of Claim filed on 12 November 2009. As mentioned earlier, the current pleading is the Further Amended Statement of Claim filed on 8 December 2010.

**[22]** The Defendant filed a Defence on 3 March 2010. That Defence was clearly not drawn by a legal practitioner and its content was capable of giving rise to a measure of confusion. However, the matter was clarified on 8 March 2010 by the parties in the form of orders made, by consent, that the only substantive defence raised by the Defendant was one of justification.

**[23]** At the commencement of the hearing before me, the Defendant acknowledged that he had published the website and emails complained of. He accepted broadly that the imputations and representations pleaded by the Plaintiffs were conveyed by the publications. The Defendant stated that it was his case that everything in the matters complained of (including the imputations and representations) was true and that he stood by their content (T29-31).

**[24]** In these circumstances, the issues for determination by the court with respect to each matter complained of are as follows:

- the extent of publication of each of the matters complained of;
- whether the defence of justification under s 25 Defamation Act 2005 ought succeed;
- whether the conduct of the Defendant in publishing each of the matters complained of was misleading or deceptive, or likely to mislead or deceive, for the purpose of the claim under the FT Act;
- the extent of damage suffered by the Plaintiffs and the calculation of damages;
- whether the Plaintiffs have made out a case for injunctive relief with respect to the defamation claim, and for injunctive and declaratory relief under the FT Act;
- interest; and
- costs.

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**REEL: 028004 FRAME: 0112**

## The Matters Complained Of

**[25]** The evidence reveals that the Defendant has made, and has continued to make, publications to parties with whom PDC deals which make two broad types of allegations:

the Defendant asserts that the Mainline system is not safe;  
the Defendant asserts that the rights to the invention have been stolen from him.

## The Website Publication of August 2009

**[26]** The first matter complained of is the website published by the Defendant in August 2009 (Ex A2). It is lengthy and a copy of it is annexed to this judgment.

**[27]** The evidence reveals that the website appeared in August 2009 under a headline "Mainline Power & Data Announcement", and was the second result appearing, on a Google search, immediately following the legitimate Mainline website.

**[28]** Although it is necessary to read the website as a whole, an impression of its tone and content may be obtained from the following extracts.

**[29]** The website commenced with the word "WARNING" in red capital letters at least 1.5 centimetres high. Immediately under the heading were the following words (Ex A2, p 1):

Michael McDermott founder of McDermott Drilling Pty Ltd, Peter Higgins founder of Mortgage Choice, Jaroslav E Haba & Kevin Truskett engineers employed by the inventor, conspired and stole the Intellectual Property (IP) from the inventor, for the Mainline product, produced by Power & Data Corporation Pty Ltd (PDC).

Adding names to someone else's patent does not make them inventors ... they are the same people who never had an original idea in their lives.

It is not the intention to go into the theft of the IP, but to WARN PEOPLE about the product and some of the DANGERS you may face if you install this product in your home or office.

The product is DANGEROUS ... When PDC's fake inventors realised they could not make the product work after shafting the real inventor, they went to extreme measures to make a buck at any expense (mainly investors) ... and now the product is DANGEROUS due to its POOR design and lack of knowledge about the product. The directors of PDC are using the community and Australian schools lack of knowledge about the product to try and make a profit from a failing UNSAFE Mainline system. The directors of PDC will claim that the product is safe because it has passed testing and approval ... when they know full well, that it is not ... read on to see why.

**[30]** The website continued to criticise the Mainline system on safety grounds, before stating in red capital letters (Ex A2, p 2):

BE WARNED DO NOT BURN IN YOUR BED WHILST ASLEEP

**[31]** After further statements and diagrams concerning the safety of the product, the website said (Ex A2, p 3):

A TIME BOMB IN YOUR HOME

**[32]** Further criticisms were made of the product on safety grounds, before the following statement appears (Ex

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A2, p 5):

One of the directors of PDC is an ex member of parliament, he has contacts within the government and he can see a quick buck. He is hopeful to recover his lost investment in PDC making the government pay the cost through the schools and the BER scheme ... twice. Once to put it in and later to replace it at tax payers expense.

THE USE OF AUSTRALIAN KIDS TO TEST AN UNSAFE PRODUCT to make a dollar IS A LOW CALL

**[33]** After further criticisms on safety grounds, the following appears (Ex A2, p 6):

To potential purchasers of the Mainline product REMEMBER, WHEN PDC GO INTO LIQUIDATION WHICH THEY WILL YOU WILL BE RESPONSIBLE [sic] FOR THE COST TO REWIRE YOUR HOME. THIS REWIRE WILL BE VERY EXPENSIVE.

I am the original inventor of the Mainline system, I have represented Australian [sic] and to this day I am the only winner of "The Oscar of Inventions" Geneva Switzerland and the Yellow Pages Channel 9 Small Business Show for the Power Track Product.

**[34]** After further statements concerning patents and other matters, it is said (Ex A2, p 6):

This would never have happened if the real inventor had not been shafted and his IP stolen.

**[35]** A little later, the following words appear (Ex A2, p 7):

DO NOT TRUST PETER HIGGINS OR MICHEAL [sic] McDERMOTT IF YOU ARE AN AUSTRALIAN INVENTOR (or anyone else) NO MATTER WHAT THEY OFFER

**[36]** Following statements about the patent and other matters, the website states (Ex A2, p 8):

Should you wish to contact me about this page then click here I am happy to answer your questions or you can believe what is feed [sic] you by PDC

PDC Investors I think its safe to say ... you have been ripped off ... the patent for Mainline is worthless, certain people knew no one would invest without a patent and they knew you would not know if the patent was good or not. Mainline patent is under threat as the inventors are false and it has been superseded by my 2003 patent.

**[37]** The website ends in the following way (Ex A2, p 8):

You may ask yourself the question if I had any claim to the Mainline patent then why do I not take legal action against PDC, again this is quite simple "WHAT FOR" its a waste of money. As the inventor I can re invent, as I have done with my 2003 patent and again with WiserWire. PDC's patent will not prevent me ... I know the Mainline patent better than PDC as it was me who originally instructed your patent attorney ... I'd be surprised if anyone in PDC have even read it let alone understand it.

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MY MAIN INTENTION IS TO PREVENT THE UNNECESSARY [sic] DEATH OR INJURY OF A CHILD DUE TO AN UNSAFE MAINLINE SYSTEM.

### The Emails Sent in July 2010

[38] The second matter complained of is an email sent by the Defendant on 12 July 2010 to the Australian distributor of the Mainline system (Ex B). That email gave a subject line "Safety Mainline Power" and said:

Dear Sir

I am writing to you to warn you of serious safety features with the Mainline Product.

You may have seen the reports by Dr Grantham & Mr N Carmody stating that the product is safe.

It has always amazed me that people will put other people at risk for a dollar.

Power & Data do somewhat skirt around the facts.

As a response to those reports I have attached my report on safety.

Do not be like Dr Grantham or Carmody please use your intelligence and TRY the tests yourself.

Should you wish to continue with the distribution of the Mainline product I would like to suggest you make sure your insurance is well paid.

I am in the Supreme Court against Power Data Corporation about the safety issues and the report I have attached to this email will be public.

When the victims of Mainline seek compensation I wish it to be clear who is responsible and that the full amount is paid to them whether it be loss of life, injury or property.

Take a knife or end of a spoon, fork, scissors and TRY the test and ask yourself ... should this be in Australian schools. TRY the same test with a GPO/power point. There are many more things that can be inserted into Mainline than a GPO.

Ask your Patent attorney what happens to a Patent if its [sic] proven that extra inventors names are added to the patent who were not inventors to try and water down the real inventor.

I can assure you if my Intellectual Property was not stolen from me then the Mainline product would not have these issues.

It is my assumption that Power & Data Corporation will use you to setup their company to be public listed. The directors and investors will sell all their shares appoint new directors and leave the entire mess behind them ... This as I have said is an assumption ... what do you think?

The Awards won so far are for the INDIAN ADAPTOR not the SYSTEM don't be fooled.

I wish you the best and hope you do not become a victim as so many companies have before you.

Regards.

John Sinclair

Inventor of Power Track

[39] The third matter complained of is an email sent by the Defendant on 12 July 2010 to the United Kingdom distributor of the Mainline system (Ex C). This email gave as a subject line "Mainline Power Data" and was in almost identical terms to the second matter complained of.

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**REEL: 028004 FRAME: 0115**

[40] Perusal of each of the matters complained of provides an understanding of the content and tone of the publications made by the Defendant. It will be observed that the second and third matters complained of were published after the present proceedings were commenced, and referred to the proceedings and reports which the Plaintiffs had served upon the Defendant for the purpose of the litigation, together with a report which the Defendant had himself prepared (and utilised) in these proceedings.

### **The Pleaded Imputations and Representations**

[41] It is appropriate to set out the pleaded imputations and representations upon which the Plaintiffs rely with respect to each of the matters complained of (MFI15).

[42] The imputations arising from the first matter complained of are as follows:

- (a) Mr Higgins had conspired with others to steal the intellectual property in the Mainline product from the Defendant;
- (b) Mr Higgins, as a director of PDC, had permitted the sale of the Mainline product to Australian schools, despite knowing that the product was much more dangerous than conventional electrical wiring systems;
- (c) Mr Sharp had cynically sought to promote a product which he knew would fail, to make the government and taxpayers end up paying for the cost to replace the product when it did fail;
- (d) Mr Sharp, as a director of PDC, had permitted the sale of the Mainline product to Australian schools, despite knowing that the product was much more dangerous than conventional electrical wiring systems.

[43] The representations arising from the first matter complained of are as follows:

- (a) PDC would go into liquidation, leaving its customers responsible for the cost of rewiring their homes;
- (b) the Mainline system developed and marketed by PDC was likely to cause avoidable death or injury to children, because it was more dangerous than conventional power conduction systems;
- (c) PDC does not own the intellectual property in the Mainline system;
- (d) the intellectual property in the Mainline system produced by PDC was stolen from the inventor.

[44] The representations arising from each of the second and third matters complained of are as follows:

- (a) PDC was responsible for the Mainline system which was so dangerous that it would lead to claims for compensation for loss of life, injury or property;
- (b) PDC had stolen the Defendant's intellectual property in the Mainline system from him;
- (c) the validity or efficacy of the patent for the Mainline system was in doubt because extra inventors' names had been added to the patent.

[45] It will be observed that representations (a) and (b) with respect to the first matter complained of (relating to the safety issue) were representations with respect to future matters, as are representation (a) concerning each of the second and third matters complained of. As will be seen, this feature is pertinent to the claims under the FT Act.

### **Publication**

[46] Although the Defendant has not placed in issue in the proceedings the question of publication, it is appropriate, as the Defendant is unrepresented, to set out briefly my findings in that respect.

[47] Publication requires proof that the recipient has read or otherwise comprehended the matter complained of. Such proof may be direct or indirect, being established by the drawing of an appropriate inference.

### **Publication of the First Matter Complained Of**

[48] Publication over the internet does not occur until the material is downloaded by the reader (as opposed to

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when it is uploaded by the publisher) because that is when it is comprehended by the reader: *Dow Jones & Co Inc v Gutnick* [2002] HCA 56 ; 210 CLR 575 at 600 [26]. That principle is relevant to the publication of the first matter complained of, which was made available for publication by the Defendant on a website utilised by him in August 2009.

**[49]** I accept that the version of the website, substantially as it appears in Ex A2 (annexed to this judgment), was the published form of the first matter complained of. There is evidence bearing directly upon the extent of publication of the website. The website was seen by Mr Sharp's bank manager, Mr Krull, who drew it to the attention of Mr Sharp.

**[50]** The Defendant gave evidence that the first matter complained of was posted on his website on 5 August 2009 and remained there for two days, before being taken down on 7 August 2009. It was submitted for the Plaintiffs that the first matter complained of remained available on the internet for some considerable time after 7 August 2009, despite whatever steps the Defendant asserts that he took to take it down. Parts of the oral and documentary evidence are relied upon in support of this submission of the Plaintiffs.

**[51]** Firstly, Mr Sharp gave evidence, which I accept, that after he became aware of the Defendant's website publication he was contacted by about 15 people who informed him that, in looking for the legitimate Mainline website, they had come across the Defendant's website which they had looked at and concluded was critical of the Plaintiffs (T264).

**[52]** Secondly, the Plaintiffs point to emails sent by the Defendant on and after 7 August 2009 which suggest that a website adverse to the Plaintiffs continued to exist, although perhaps at a different address (Ex HH).

**[53]** In an email sent at 2.51 am on 7 August 2009 to Mainline, the Defendant said, amongst other things, "I'll let your distributors know the new address and they can let you know" (Ex HH, p 2).

**[54]** In an email sent by the Defendant to Mainline at 5.03 pm on 9 August 2009, he said "As you will see I have updated the web page for you ... the other page is up and running on new sites ... " (Ex HH, p 3).

**[55]** In an email from the Defendant to Mainline at 11.04 am on 10 August 2009, the Defendant said "I know your [sic] itching to see the new site that I have sent to all your distributors" (Ex HH, page 4).

**[56]** In a further email sent by the Defendant to Mainline at 10.08 am on 12 August 2009, he said "I'll start the web pages and I think I'll start with the UK, followed by Memphis in the US, and so on, UK should have it by tomorrow morning" (Ex HH, p 5).

**[57]** In an email to Mainline at 12.08 pm on 19 November 2009, the Defendant said "The web page was taken down two weeks ago (thus this email address) but, I will continue to publish information about your unsafe product to warn the public and the companies you are trying to rip off, of its dangers" (Ex HH, p 6).

**[58]** I accept that statements made by the Defendant in emails sent to Mainline personnel on and after 7 August 2009 suggest that the material on the offending website was still available. It is certainly not the case that the Defendant was offering some assurance to PDC that he had taken all available steps to remove the website. His emails to Mainline personnel suggested that the material was still there.

**[59]** I am satisfied on the balance of probabilities that material along the lines of Ex A2 continued to be accessible on a website for at least a period of weeks after 7 August 2009. Even if I did not reach this conclusion, and a finding was made that the Defendant had taken steps to remove the offending website on 7 August 2009, this still leaves open the availability of cached copies on the internet, via a search engine such as Google, for some time. The Defendant would remain liable for such a publication. In an email from the Defendant to Mr Hield, the relevant web manager, on 7 August 2009, the Defendant appeared to acknowledge the prospect of cached copies when he said "Of coarse [sic] the WiserWire webpage will still sit just under their webpage in Google but, there is nothing you or I can do about that ... Google crawl every month and they have just completed it ... so I suppose they will have to just put up with it for another month" (Ex 19).

**[60]** I am satisfied that the publication of the first matter complained of extended to a significant number of persons, although the exact number cannot be determined, being a class which wholly or largely comprised persons of significance to the Plaintiffs, such as potential customers for the Mainline system. I infer that a further, indeterminate but significant number of people, beyond the (approximately) 15 persons who contacted Mr Sharp,

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viewed the website and that these persons had a particular interest in the Mainline system so as to lead them to search for that name in the first place.

### **Publication of Second and Third Matters Complained Of**

**[61]** In relation to the second and third matters complained of, I infer that each of the emails was received by its intended recipient. As Exs B and C demonstrate, there were responses to these emails which fortify the conclusion that the emails were received by, respectively, the Australian and United Kingdom distributors of the Mainline system. Like letters, emails are sent to addresses and the evidence demonstrates that the emails which are the second and third matters complained of were received by those to whom they were addressed.

**[62]** The second matter complained of was published to Mr Brett Euler, business manager with Rushmore Distributors, an Australian distributor of the Mainline system. It ought be inferred that publication of the second matter complained of extended to other persons who had dealings or potential dealings with PDC within the Australian market.

**[63]** I am satisfied that the third matter complained of was published to GMB Info, the email address for Steljes, a United Kingdom company which was PDC's international distributor in the United Kingdom and in Europe (Ex C). I infer as well that the third matter complained of was published to other persons who had dealings or potential dealings with PDC at an international level.

**[64]** Generally, with respect to publication of the first, second and third matters complained of, it is the case that there was not wide and unbridled publication to a general audience. However, it is probable that those accessing the website were existing or potential customers seeking to do business with PDC concerning the Mainline system. In addition, others such as Mr Krull (Mr Sharp's bank manager), had particular knowledge which would see the publication read and understood.

**[65]** The emails which constitute the second and third matters complained of were targeted publications directed to the Australian and international distributors of the Mainline system on behalf of PDC. This was an audience amongst whom significant damage could be done to the business and reputations of each of the Plaintiffs.

### **Defamatory Meaning**

**[66]** The Defendant did not seek to put in issue the defamatory meaning of the matters complained of. However, as he is unrepresented, it is appropriate that I make findings as part of the determination of the Plaintiffs' claims.

### **Identification**

**[67]** For a publication to be actionable, it must be "of and concerning" the plaintiff. This requires the plaintiff to be identified. If a plaintiff is not named, then he or she must be identifiable, as the subject of the defamatory sting, to the viewer of the material by some other means. Proof of identification may arise:

- (a) from direct evidence, where a person who read the matter complained of gives evidence that he or she identified the plaintiff as the person referred to; and/or
- (b) by inference, where the court is satisfied that, by reason of the extrinsic facts and surrounding circumstances, at least one person who read the matter complained of would have identified the plaintiff as the person referred to.

**[68]** Whatever the form of proof, the court needs to be satisfied as well that such identification, direct or inferential, was reasonable in the circumstances: *Gardener v Nationwide News Pty Ltd* [2007] NSWCA 10 at [43]-[46], [50].

**[69]** Mr Higgins was named expressly in the first matter complained of so that there is no question of identification of him for the purpose of his claims against the Defendant.

**[70]** On the other hand, Mr Sharp was not referred to by name and it is necessary to consider whether he is identified in the first matter complained of.

**[71]** The first matter complained of contains the statement extracted at [32] above.

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[72] Mr Sharp gave evidence that he was formerly a Member of Parliament, is a director of PDC and is and was at the time of publication of the first matter complained of, the only director of PDC who was formerly a Member of Parliament. An inference should be drawn that readers of the first matter complained of, who had an interest in the Mainline system and PDC, would have been aware of those facts and so identified Mr Sharp.

[73] Apart from this inference, which ought be drawn, there is direct evidence from Mr Krull that he had read the first matter complained of and identified Mr Sharp because of those facts. This is also the case with respect to the reaction of the various other persons who contacted Mr Sharp and reported that they had read the first matter complained of and who knew that he had been a Member of Parliament (T264).

[74] It is reasonable in the circumstances for readers to have identified Mr Sharp as the person referred to in the first matter complained of.

### Ordinary Reasonable Reader

[75] To determine whether the Plaintiffs' imputations are conveyed and are defamatory, the court must place itself in the position of a hypothetical person, being the ordinary reasonable reader. The question is whether the defamatory sting would be conveyed by the publication in its natural and ordinary meaning.

[76] The ordinary reasonable reader is a person of fixed, unvarying attributes. They are said to be of fair average intelligence, a fair-minded person, not overly suspicious, not "avid for scandal", not naive, not searching for strained or forced meanings, and one who reads the entirety of the publication of which complaint is made: *Farquhar v Bottom* [1980] 2 NSWLR 380 at 385-386; *Amalgamated Television Services Pty Ltd v Marsden* (1998) 43 NSWLR 158 at 165.

[77] It is relevant to take into account the nature of the publication. The publication of the internet site was of a serious nature. It was not a transient publication, but was one that could be retained on a computer for re-reading or printed in a permanent form: *Haddon v Forsyth* [2011] NSWSC 123 at [20].

[78] Each imputation relied upon has to be considered in the context of the entire matter complained of.

[79] To determine whether something is defamatory of a plaintiff, the court must consider whether it tends to lower the plaintiff's reputation in the minds of right-thinking ordinary members of the community, being persons of fair average intelligence. This question is to be decided by considering the plaintiff's imputations in the context of the matter complained of.

### The Plaintiffs' Imputations

[80] The imputations which the First and Second Plaintiffs plead as being carried by the first matter complained of are set out at [42] above.

[81] With respect to imputation (a) concerning the first matter complained of, I am satisfied that this imputation arises from the whole of the first matter complained of and, in particular:

- (a) page 1, including the first three paragraphs where Mr Higgins is named with others as having conspired and stolen the intellectual property for the Mainline product from the inventor, with a further reference to the theft of the intellectual property following shortly after (see [29] above);
- (b) a further reference at p 6 to the real inventor having been "shafted and his IP stolen" (see [34] above);
- (c) the statement on p 7 "Do not trust Peter Higgins ... if you are an Australian inventor ..." with a further reference shortly after to the intellectual property having been stolen (see [35] above);
- (d) a further reference on p 7 to designs having been stolen.

[82] Once again, the Defendant accepts that this imputation arises from the first matter complained of (T30). It is entirely clear that an allegation of conspiracy to steal intellectual property is defamatory of the First Plaintiff.

[83] The Defendant accepts that imputation (b) arises from the first matter complained of (T30). Independently of the Defendant's acceptance of this proposition, I am well satisfied that the imputation arises from the first matter

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complained of.

**[84]** I am satisfied that an allegation to the effect that Mr Higgins knowingly endangered school children is defamatory.

**[85]** Imputation (c) of the first matter complained of is alleged to arise from the whole of that matter, especially that appearing on p 5 of Ex A2 under the heading "So Why The Government BER Scheme and Aus Industry" . The relevant passage concerning Mr Sharp was reproduced at [32] above.

**[86]** Once again, the Defendant accepts that this imputation arises from the first matter complained of (T30). Quite apart from this concession, I am well satisfied that the imputation arises from the first matter complained of.

**[87]** I accept the submission for the Plaintiffs that this allegation is to the same effect as calling Mr Sharp a conman or a fraudster, and that he promotes a product that he knows will fail. Such an allegation is clearly defamatory of him.

**[88]** Imputation (d) of the first matter complained of is said to arise from the whole of that matter. Again, the Defendant accepts this imputation arises from the first matter complained of (T30). Apart from this concession, I am well satisfied that the imputation arises from the material.

**[89]** An allegation to the effect that Mr Sharp has knowingly endangered school children is clearly defamatory.

### **Defence of Justification**

**[90]** As mentioned above, the Defendant relies upon the defence of justification with respect to the claim against him for defamation. Section 25 Defamation Act 2005 provides as follows:

25 Defence of justification

It is a defence to the publication of defamatory matter if the defendant proves that the defamatory imputations carried by the matter of which the plaintiff complains are substantially true.

**[91]** As s 25 makes clear, the onus lies upon the Defendant to prove that the defamatory imputations carried by the matters of which the Plaintiffs complain are substantially true.

**[92]** The Plaintiffs note that the defence of justification at common law is not taken away nor modified by the Act: s 24 Defamation Act 2005 . However, for present purposes, the common law defence is no broader than the statutory defence and need not be further considered.

**[93]** The term "substantially true" is defined in s 4 Defamation Act 2005 to mean "true in substance or not materially different from the truth".

**[94]** It is incumbent on the Defendant to establish that each material part of the imputation is substantially true: *Howden v Truth & Sportsman Ltd* [1937] HCA 74 ; 58 CLR 416 at 420-421. However, it is the defamatory sting which must be substantially true and minor variations do not matter: *Sutherland v Stopes* [1925] AC 47 at 55 and 79. The truth or otherwise of the imputation is to be determined in the context of the matter complained of: *Greek Herald Pty Ltd v Nikolopoulos* [2002] NSWCA 41 ; 54 NSWLR 165 at 172-173 [19]-[27]. As a general rule, an imputation must be proved true by reference to facts as they were at the time that the matter complained of was published, or so close to that time as permits inferences properly to be drawn as to the state of affairs at that time.

**[95]** I have mentioned that the onus of proof concerning the substantial truth of the imputation lies upon the Defendant. The standard of proof is the civil standard, on the balance of probabilities, although as the Plaintiffs submit (correctly), the serious nature of the allegations (theft and intentional exposure of children to danger) requires cogent evidence to discharge the onus: s 140 Evidence Act 1995 ; *Amalgamated Television Services Pty Ltd v Marsden* [2002] NSWCA 419 at [61]; *Palmer v Dolman* [2005] NSWCA 361 at [40]-[47].

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## Defence of Justification -- The Safety Allegations

**[96]** As mentioned earlier, the factual issues falling for determination in these proceedings concern safety allegations and intellectual property allegations made by the Defendant. In this part of the judgment I will consider the evidence, and make necessary findings, with respect to the safety allegations. Although these findings will be made in the context of the defence of justification arising from the claims in defamation, these findings will be relevant as well to the claims under the FT Act, to which I will return.

**[97]** The Defendant did not draw together his arguments concerning safety in closing submissions. However, his evidence and cross-examination touched upon a number of safety issues, including the following:

- (a) ease of access of a knife or bottle opener to the active component;
- (b) ease of insertion of a coin in the groove and the risk that the active component would be touched in the process of removing the coin;

the fact that promotional material indicates that the Mainline system could be installed in a kitchen near water, where additional safety issues arise from corrosion etc;

the risk of fire;

what are said to be particular safety concerns because of the corner connectors used in the Mainline system;

- (f) whether the stamped copper rails in the Mainline system are "fixed in thermoplastic" (see Ex U).

**[98]** The issues to be determined with respect to the safety allegations are to be considered in light of the evidence and with a sense of practical reality. I agree with the following proposition contained in the Plaintiffs' written submission (para 104):

In considering the safety allegations, the main issue is not one of absolute safety (which can only be an abstract concept), but relative or real-world safety. Virtually every human activity involves danger, and many aspects of modern life are routinely attended with it: driving motor cars, flying in aeroplanes, engaging in sporting or other recreational activity, all involve real risk, and in each case the question of safety can only be answered in relative terms. Perhaps less obviously, but just as certainly, ordinary domestic activities also involve a certain, but very low, level of risk, activities such as climbing stairs, using electrical appliances, gardening or lighting a barbeque.

## The Plaintiffs' Evidence Concerning the Safety Allegations

**[99]** The evidence reveals that the Mainline system has been sold since April 2008 in Australia, the United Kingdom, Germany, India and more recently, Lebanon, without incident (T78).

**[100]** The evidence reveals that the Mainline system complies with detailed and specific standards, including AS/NZS61534.1:2008 entitled "Power Track Systems" (Ex Q) and AS/NZS3112:2004 entitled "Approval and Test Specification -- Plugs and Socket Outlets" (Ex R). These standards contain both general provisions as to safety and function, and specific requirements relating to safety including fire risk and electrical shock risk.

**[101]** Further, the evidence reveals that the Mainline system has been extensively tested by a number of independent testing laboratories, which have produced detailed testing reports in relation to the track components and the power point adaptor components (Exs S, T, U, V, W, X, Y, Z).

**[102]** The fact that the Mainline system complies with relevant standards was confirmed in a document tendered by the Defendant, being an email dated 16 September 2010 from Peter King, principal investigator with the Department of Services, Technology and Administration (Ex 29). Mr King had issued a certificate of suitability dated 28 February 2007, with an addendum dated 8 April 2008 concerning the Mainline system (Ex U).

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[103] As mentioned earlier, the Plaintiffs relied upon the evidence of several witnesses with respect to the safety allegations, in particular, Mr Andrews, Dr Grantham and Mr Carmody. The Defendant cross-examined the Plaintiffs' witnesses and tendered a number of documents himself during cross-examination.

#### **Evidence of Mr Andrews**

[104] Mr Andrews is the chief engineer at PDC, and he is in charge of ensuring that the Mainline system meets Australian and international standards. He was previously the design engineer. He holds a Diploma in Mechanical Engineering, a Post-Graduate Certificate of Management and is currently studying for a degree in Masters of Engineering Management (T77).

[105] Mr Andrews gave evidence that the Mainline system has been sold in Australia, Germany, the United Kingdom and Lebanon with the first sale in April 2008 (T78). It is currently installed at Sydney University and a large school in Sydney, and there are 13 further sites in which it is being installed (T84). Mr Andrews said there had been no safety incident in relation to the product (T109).

[106] It was the evidence of Mr Andrews, supported by relevant documentation, that the Mainline system has met all applicable safety standards and has been deemed safe for manufacture and sale in Australia and elsewhere. One of the adaptors for the Mainline system has won a design award in Australia (Ex O) and overseas (Ex P).

[107] It is noteworthy that the matters complained of were each published after the Mainline system had undergone all of the testing identified in evidence, and had received passes in relation to all relevant standards.

[108] Although the Defendant did not advance any detailed argument in closing submissions, it is appropriate that I refer to some of the matters taken up by him in cross-examination of Mr Andrews and express my conclusions with respect to them.

[109] The Defendant suggested to Mr Andrews that the entire Mainline system had not been tested as an entity. Mr Andrews disagreed with that proposition and referred to a number of documents which indicated that the entire system had been tested (T111, T121, T194). I accept the evidence of Mr Andrews that the evidence concerning testing of the Mainline system demonstrates testing of the whole system. The Defendant has not demonstrated any gap or failure in this respect.

[110] The Defendant raised issues concerning PDC's installation manual. Mr Andrews explained the development of the installation manual through various updates (Exs AA, BB, CC; Exs 4, 5). His evidence explained this process in a rational way, which did not support any of the safety concerns raised by the Defendant.

[111] With respect to the cross-examination by the Defendant of Mr Andrews concerning temperature rise and potential for fire, Mr Andrews gave evidence, which I accept, that the system has been tested in accordance with appropriate standards to guard against fire (T136, T183).

[112] During the course of a lengthy cross-examination, Mr Andrews, at times, sought to respond to some of the Defendant's questions by way of a general response that the Mainline system complied with all relevant standards and had been tested and had passed relevant tests. Although at times this general response did not address directly the specific issue raised in the question, I am satisfied that Mr Andrews responded in a realistic way.

[113] The evidence reveals the existence of detailed Australian and international standards with respect to a system of this type, and that PDC has taken substantial steps to ensure that the Mainline system complies with all relevant standards. Testing had been carried out and, certainly by the time of publication of the first matter complained of in August 2009, there were no outstanding steps which PDC needed to take to satisfy relevant authorities that the Mainline system complied with all applicable standards. This is an important point given that the Defendant took it upon himself to publish the first matter complained of in August 2009.

#### **Evidence of Mr Carmody**

[114] Mr Carmody prepared an expert report dated 27 May 2010 (Ex D). He is a retired senior lecturer in electrical and computer systems engineering at the University of Technology, Sydney. He has graduate and post-graduate engineering qualifications and trade qualifications, including as a qualified electrical contractor.

**[115]** In his report, Mr Carmody responded to each of the Defendant's allegations in the first matter complained of, and gave his views more specifically in relation to electrical contacts and standards.

**[116]** Mr Carmody expressed the view that the Defendant's claims are not factually correct and are largely speculative (Ex D, p 22). He expressed the view that the Mainline system does not pose a greater risk than that posed by normal power points commonly found throughout typical Australian domestic premises, and he reaffirmed that view in re-examination (T255). Mr Carmody expressed the view that all electrical contacts will eventually give rise to problems but that, if the Mainline system is used in accordance with its specifications, it would not give rise to additional problems above and beyond those encountered with standard power points (T235). He expressed the view that the Mainline system represented an acceptable trade off between utility and safety in the same way as a conventional power point does (T237).

**[117]** In cross-examination, Mr Carmody accepted that if a 10 cent piece was inserted in the groove in the Mainline system, then it might be possible, in the course of attempting to prise the coin out, to come into contact with the active conductor (T252-253). Despite this, Mr Carmody stated in re-examination that the Mainline system did not pose a greater risk than conventional power point systems (T255).

**[118]** Mr Carmody was cross-examined concerning the installation of the Mainline system in a kitchen setting and possible risks which might arise from this. He responded that any installation would be a matter for the electrician or electrical contractor, having regard to the particular circumstances of the layout of the kitchen and the requirements of AS3000, which made specific provision concerning the location of power points in places such as kitchens and bathrooms and wherever moisture and chances of electric shock exist (T254). In my view, this is a reasonable approach given the requirement that the electrician or electrical contractor assess the particular layout and circumstances of the room or rooms in which the Mainline system is to be located.

#### **Evidence of Dr Grantham**

**[119]** Dr Grantham prepared an expert report dated 23 October 2009 (Ex E). Dr Grantham has a PhD and BSc with first-class honours in electrical engineering. He has in excess of 45 years' experience in the electrical industry. He is a chartered engineer and a Fellow of the Institution of Engineering and Technology (UK).

**[120]** Dr Grantham was asked to comment upon the Defendant's allegations about the Mainline system in the first matter complained of. He concluded that the Defendant's allegations were alarmist, unsubstantiated and did not represent a balanced view of the Mainline system.

**[121]** In cross-examination, Dr Grantham acknowledged that a problem might arise with connection of the Mainline system if it was carried out by a "really ham-fisted" electrician (T208.18). In re-examination, Dr Grantham said that perils arising from acts of a "ham-fisted electrician", who may act incompetently, could also cause similar perils to arise from the installation of conventional power systems (T223).

**[122]** In cross-examination, Dr Grantham expressed the view that the conductor was fixed and that it was part of a fixed installation (T212).

**[123]** At the request of the Defendant during cross-examination, Dr Grantham was able to insert part of a flat metal bottle opener (Ex 15) into the sample of Mainline track (Ex N) (T221-222).

**[124]** In re-examination, Dr Grantham acknowledged that there were risks that items such as a pin or an unfolded paperclip could be inserted into a conventional power point giving rise to a risk of shock, but that the existence of that risk involved an acceptable trade off between the risk of shock and fire and the need for the supply of power to people in their everyday life. He agreed that the Mainline system involved a similarly acceptable trade off between the need to ensure safety and the need to provide accessible power to people in their ordinary life (T224).

**[125]** In further cross-examination by leave, Dr Grantham pointed to possible safety issues with respect to standard power points and the Mainline system, including the greater visibility of a standard power point, and associated with the risk of insertion of items by children into it, and he acknowledged that the use of a metal object to try and remove a 10 cent coin from the groove in the Mainline system might give rise to a risk of touching the active element. Dr Grantham observed that it was "similar if someone used a fork in an attempt to remove toast, a piece of bread from a toaster, that also could touch the active conductor" (T225-227).

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**[126]** I observe that the various experiments carried out in court (at the request of the Defendant), involving insertion of a coin or a flat bottle opener into the Mainline product, utilised a short section of track (Ex N). It should immediately be observed that insertion of items into that section does not, in my view, provide particular assistance to the Defendant. When used in practice, the Mainline product is fixed to the wall with corner connectors, which would give the track additional rigidity. I accept the Plaintiffs' submission that this impacted significantly upon the use that could be made of these in-court demonstrations.

**[127]** The Plaintiffs submit that, in any event, the possibility of a person of any age mischievously inserting a metal object, such as a paper clip, hairpin or wire into a conventional power point is one of those risks which is inherent in the use of electricity. Dr Grantham noted in evidence that a standard power point is more visible to a child and more likely to attract a child's attention than the Mainline system (T225). I accept the Plaintiffs' submissions in this respect.

### **The Defendant's Evidence**

**[128]** The substance of the Defendant's case emanated from his own evidence. Mr Smark SC made a number of submissions concerning the weight to be attached to the Defendant's evidence and it is appropriate that I express my conclusions on that aspect.

**[129]** The evidence reveals that the Defendant has no tertiary qualifications. He left school after Year 10 and worked for a period as a carpenter. He has no formal training or qualifications in electrical engineering, nor as an electrician.

**[130]** That said, the Defendant has immersed himself for some years in the field of invention with respect to Power Track-type systems. In 1997 and 1998, he received awards for activities in this field (Exs 22, 23). The Defendant was nominated as the inventor in the provisional patent application dated 18 December 2002 with respect to the system which is now the Mainline system (Ex H), and was nominated as one of four inventors with respect to that process in the standard patent application dated 18 December 2003 (Ex K).

**[131]** It may be seen that all of these matters equipped the Defendant to give admissible opinion evidence with respect to safety issues in the case. The Defendant prepared a report dated 12 June 2010 entitled "Mainline Power Track System Safety Report" (Exs 3, 3A) which was admitted in the proceedings. The Plaintiffs did not object to the tender of that report, but submitted that limited weight could be attached to it because of the Defendant's limited expertise (certainly in contrast to Dr Grantham and Mr Carmody) and because the Defendant is not independent.

**[132]** The ability to give admissible expert opinion evidence does not depend upon the holding of relevant tertiary qualifications. Section 79(1) Evidence Act 1995 provides that if a person has specialised knowledge based on the person's training, study or experience, then the person may give opinion evidence that is wholly or substantially based on that knowledge. It may be said that the Defendant has acquired specialised knowledge as a result of his experience. The Defendant has emphasised that feature during the course of the hearing. However, that is only one aspect of the matter.

**[133]** Dr Grantham and Mr Carmody have tertiary qualifications in electrical engineering and have taught for significant periods in that field, as well as acting as consultants and providing opinions with respect to issues in that field. The areas under consideration in this case include not just the practical features of the Mainline system, but the broader concept of functional electrical safety, the nature and effect of relevant safety standards which apply to such a system and electrical engineering issues bearing upon all these aspects.

**[134]** Although the Defendant has the advantage of a longer history of involvement with the development of such systems, his ability to give expert opinion evidence on broader electrical safety and electrical engineering issues was limited. That is not to say his opinions ought be given no weight. The Defendant's report of 12 June 2010 constituted, in reality, the high point of his case to make out the defence of justification with respect to the safety allegations.

**[135]** This brings me to a significant factor which impacts upon the weight to be given to the Defendant's report and evidence. The Defendant is not an independent expert witness. He is, of course, a party to the proceedings. This does not mean that he is not able to give admissible opinion evidence: *Sydney South West Area Health Service v Stamoulis* [2009] NSWCA 153 at [186]-[225].

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[136] It should be kept in mind that the origin of this litigation lies in the making of very strong allegations by the Defendant that the Mainline system is fundamentally unsafe in a number of respects which were said to endanger lives. More than once during the hearing, the Defendant said that he published these matters so that he would be taken to court and would have an opportunity to prove the unsafe nature of the Mainline system. Under cross-examination, he readily acknowledged that he had taunted or threatened the Plaintiffs in his website and emails so that he would be taken to court (T398, T403-404, T407).

[137] When the matter came to hearing, the only evidence which the Defendant had in this respect was his own. He acknowledged, under cross-examination, that his concerns did not appear to have been taken seriously by the various bodies with whom he had raised them (T394-395).

[138] It cannot be said that the Defendant brought a detached and calm mind to the resolution of the issues in the proceedings. The Defendant himself said that he was "emotional" about the product (T426). It is fair to say that the Defendant appears to be totally convinced as to the correctness of his own position and that he will not entertain any contrary position.

[139] When a court comes to assess expert opinion evidence, a witness who adopts such an approach provides a troubling foundation for a court to act on. The Defendant was literally an advocate (and a passionate advocate) in his own cause, using strong and colourful language in the matters complained of and at the hearing. He spoke as if the issues he wished to raise were self-evidently correct, expressing a level of irritation when his stance was challenged.

[140] That said, none of these aspects lead me to disregard the Defendant's evidence. After all, he has considerable practical knowledge of the relevant system and is in a position to express opinions concerning it, arising from his practical experience and knowledge in the field. However, the detached and rational assessment of the issues in the case provided by Dr Grantham and Mr Carmody may be contrasted with the Defendant's inflexible approach to issues in dispute. The Plaintiffs' expert witnesses displayed a balanced and objective approach, consistent with their obligations under the Expert Code of Conduct: r 31.23, Sch 7 Uniform Civil Procedure Rules 2005.

[141] I accept the submission of the Plaintiffs that considerable caution must be taken in approaching the Defendant's evidence on these issues, and that it is appropriate to consider the opinion evidence by reference to objectively measurable features, such as compliance of the Mainline system with specified standards, and evidence concerning testing of the system by relevant independent testing laboratories. There is a significant volume of evidence of this type in the proceedings. It must be said that it provides no assistance to the Defendant.

### **Some Conclusions Concerning the Safety Allegations**

[142] The Defendant has made very strong allegations concerning the safety of the Mainline system, with those allegations accompanied by dramatic headlines and illustrations. The Defendant has not alleged a theoretical risk arising from use of the Mainline system. Rather, his safety allegations involve claims that life-threatening events will certainly occur so that the Mainline system ought not be used in its present form. In my view, there is a very significant gap between the risks or concerns which the Defendant can point to with the Mainline system and the allegations which he makes in that respect.

[143] In my view, the evidence of Dr Grantham and Mr Carmody concerning possible insertion of items into conventional power points and the Mainline system serves to emphasise the point which the Plaintiffs make in this case. There are risks in the real world with both systems, but the risks are not materially greater with respect to the Mainline system than with a conventional power point.

[144] Further, safety concerns raised by reference to incompetent installation do not advance the Defendant's case. Incompetent installation can give rise to significant safety hazards in the context of conventional power points as well.

[145] The difficulty for the Defendant is that the publications in the matters complained of involve strong allegations of grave danger in the Mainline system, which are not supported by the evidence which he has adduced in this case through cross-examination of the Plaintiffs' expert witnesses and in his own evidence.

[146] The conclusions which I have expressed so far do not assist the Defendant with respect to the defence of

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justification insofar as the imputations contend that the Mainline system is much more dangerous than conventional electrical wiring systems in various respects. The evidence does not support such a conclusion.

[147] The topics raised by the Defendant, including those referred to at [97] above, were adequately addressed in the evidence of Mr Andrews, Dr Grantham and Mr Carmody.

[148] In reality, the Defendant is indissolubly wedded to the proposition that the Mainline system is gravely unsafe and life threatening, even though, in my view, the objective evidence advanced by him to support that proposition simply fails to do so.

[149] I accept the submission of the Plaintiffs that the evidence reveals that the Mainline system has been properly tested, complies with all relevant standards and does not pose any substantial or unreasonable risk to human safety or health, in any way which is substantially different from the risk posed by conventional power point systems. The evidence of Dr Grantham and Mr Carmody, which I accept, was to this effect.

### **Evidence of Knowledge of Danger by First and Second Plaintiffs**

[150] The imputations with respect to the first matter complained of go far beyond a claim of a lack of safety. Imputations (b) and (d), with respect to the website publication of August 2009, assert that each of the First and Second Plaintiffs knew that the Mainline system was much more dangerous than conventional electrical wiring systems. There is evidence which is entirely inconsistent with each of Mr Higgins and Mr Sharp having such knowledge. It is appropriate that I refer to it.

[151] Mr Sharp denied having such knowledge (T269-270). He was not aware of any injury, fire, electric shock or other incident involving the Mainline system (T270). Mr Sharp said that, had any such reports been made, he would, as chairman of the board, have become aware of them. I accept that no such reports were made. This was the evidence of Mr Andrews and each of the First and Second Plaintiffs.

[152] Mr Sharp gave evidence that the Mainline system was installed in the boardroom of Rex Airlines (of which he was a director), in his apartment, in the workshop at his farm and at the PDC offices (T271). All of this placed Mr Sharp in a position to use the Mainline system. He was in a position to have direct knowledge as to whether there had been any problems with respect to the system. Further, and tellingly, the use in a variety of personal and business settings of the Mainline system by Mr Sharp is entirely inconsistent with him having knowledge or a belief that the system was unsafe, let alone much more dangerous than conventional electrical wiring systems.

[153] Mr Higgins likewise denied the knowledge as contained in the imputations. He had never been told of any fires, injury, electrocution or property destruction in relation to the product (T286). Tellingly, Mr Higgins had sought to introduce the Mainline system into the schools attended by his own children (T291). He stated that he believed in the product and would not have presented it if he had any doubt about its safety (T291).

[154] In summary, the evidence of the First and Second Plaintiffs, which I accept, revealed that:

- (a) each of them expected that the Mainline system would operate safely and that it complied with all relevant standards;
- (b) given the business reputations of each of them concerning safety standards and quality, each expected the Mainline system to comply with all relevant safety standards;
- (c) at all relevant times, and certainly in August 2009, each of them believed that the Mainline system was safe, as demonstrated by their own use of the system in personal, family and business settings and a willingness to promote it in circumstances where their own family members may utilise it;
- (d) all of this was entirely inconsistent with either of them knowing (or even suspecting) that, as the imputations suggest, the Mainline system was much more dangerous than conventional electrical wiring systems.

[155] Applying the relevant principles mentioned earlier with respect to the defence of justification (at [90]-[95]), the Defendant has failed to establish the substantial truth of the safety allegations made by him in the first matter complained of.

### **Defence of Justification -- The Intellectual Property Allegations**

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**[156]** The intellectual property allegations arise in:

- (a) imputation (a) concerning the first matter complained of;
- (b) representations (c) and (d) concerning the first matter complained of; and
- (c) representations (b) and (c) with respect to each of the second and third matters complained of.

**[157]** The Defendant appears to claim that the patent now utilised for the Mainline system was stolen from him, or that it is somehow invalid because of the names of the inventors on the patent itself. The Plaintiffs observe that the Defendant has not pleaded any particulars of these allegations and that it should fail on its face. In any event, the Plaintiffs submit that the Defendant's position is essentially misconceived.

**[158]** The Plaintiffs called Mr Redfern, a patent attorney, to give evidence and he was cross-examined by the Defendant. In addition, the Plaintiffs have made submissions concerning patent law.

**[159]** The Defendant appears to have a fixed personal view concerning patent law, and the concept of invention, which he has sought to apply in the case. He has not referred the court to any statute, case or text which supports his position. He put a number of propositions concerning patent law and the concept of invention to Mr Redfern in cross-examination. The evidence of Mr Redfern has not assisted the Defendant.

**[160]** Against this background, it is necessary to express certain conclusions with respect to patent law insofar as it arises for consideration in these proceedings.

### **The Patent Issue**

**[161]** It is the case that the provisional patent application lodged on 18 December 2002 nominated PCL as the applicant and the Defendant as the inventor (Ex H). Likewise, it is the case that the standard patent application lodged on 18 December 2003 nominated PCL as the applicant, and the Defendant, Kevin Truskett, Jaroslav Emil Haba and Jeffrey Allan Jackson as the inventors (Ex K).

**[162]** The evidence reveals that the Defendant, together with others, formed PCL for the purpose of exploiting the invention. A document containing Heads of Agreement dated 25 November 2002 between the Defendant, Mr Michael McDermott and Mr Haba (Ex 2) provides support for this proposition. PCL was incorporated on 22 November 2002. The Defendant was a director of PCL from 22 November 2002 until 21 March 2003 (Ex G).

**[163]** In order to exploit the invention, PCL engaged the services of Mr Redfern of Shelston IP Patent Attorneys, filed the patent application in the name of PCL and sought interest from investors, namely Mr Higgins. The Defendant, as a director of PCL, gave instructions to Mr Redfern for the purpose of preparing the patent application.

**[164]** Upon being invited to consider the invention by PCL, Mr Higgins and Mr Jason Hine formed PDC for the sole purpose of commercialising the invention. PCL and PDC then entered into a series of agreements which had the effect of transferring the ownership of the patent to PDC (Exs J and L).

**[165]** PCL lodged a provisional patent application on 18 December 2002 at a time when the Defendant was a director of PCL. This was done with his consent. I accept the submissions of the Plaintiffs that there can be no doubt that all parties, including the Defendant, understood that the rights in the invention vested with PCL.

**[166]** The following findings are made by reference to the evidence of Mr Redfern, whom I accept as a credible and reliable witness in the proceedings.

**[167]** Mr Redfern took instructions from the Defendant, as a director of PCL, for the purpose of the provisional patent application in December 2002. The Defendant first contacted Mr Redfern on 9 December 2002 and meetings took place thereafter. On 11 December 2002, the Defendant wrote to Mr Redfern on PCL letterhead enclosing drawings for the provisional patent application (Ex M, pp 3-4). On 16 December 2002, Mr Redfern communicated with the Defendant and noted that, although the drawings were rough, they could be used for the provisional application.

**[168]** On 18 December 2002, Mr Redfern spoke to the Defendant who confirmed that he had reviewed the draft

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provisional application which was then filed by Mr Redfern (Ex M, pp 10-14).

[169] The Defendant spoke to Mr Redfern regularly in late 2002 and early 2003. At no time did the Defendant suggest to Mr Redfern that PCL should not be the applicant on the provisional patent application. At no time did the Defendant indicate that PCL was not entitled to exploit the invention which was the subject of the provisional patent application (T50).

[170] I accept the submission for the Plaintiffs that, as at 18 December 2002, the Defendant consented to a provisional application being filed for the invention in the name of PCL, with the Defendant listed as the inventor. The Defendant's conduct in that regard evidences his intention that PCL ought be the registered owner of the provisional patent, and therefore the entity entitled to exploit the invention.

[171] On 17 March 2003, PCL instructed Mr Redfern that he should no longer accept instructions from the Defendant (Ex M, pp 25-26). After March 2003, Mr Redfern took instructions from other officers of PCL to progress the preparation of the patent application (Ex M, pp 27-52).

[172] On 7 April 2003, it was noted that Mr Haba and Mr Truskett were continuing to develop the technology for the purpose of the patent application, and Mr Redfern was provided with documents in that respect (Ex M, pp 31-42). Documents were provided to Mr Redfern so that the inventors could be identified, and this was noted in Mr Redfern's email of 7 April 2003 (T56). Mr Truskett provided further drawings in May 2003 (T56-57).

[173] In light of the documents provided, Mr Redfern included Mr Haba and Mr Truskett as inventors in the standard patent application filed on 18 December 2003 (Ex K). Mr Redfern explained that, under patent law, inventors are not just the persons who conceive an invention. He said that persons who reduce the invention into practise are also inventors for the purpose of patents (T57).

[174] The evidence reveals further communications in November and December 2003, including variations to the embodiments of the invention developed by Mr Jackson, with involvement as well by Mr Truskett and Mr Haba in certain respects (Ex M1; T328-329).

[175] In due course, as mentioned earlier, the names of the Defendant, Mr Truskett, Mr Haba and Mr Jackson were included as inventors for the purpose of the standard patent application filed on 18 December 2003.

[176] In re-examination, Mr Redfern said that he considered it appropriate that the names of each of the four persons be included as inventors because of their involvement revealed in the documentary evidence (T347). Mr Redfern had earlier stated that the standard patent application included updated material over and above that contained in the provisional patent application (T57-58). Mr Redfern said that it was apparent that the additional inventors named on the patent had contributed to the updated material, but that the inclusion of the names did not suggest that each of them had an equal role to play (T59). In any event, Mr Redfern stated that the inclusion of an additional inventor would not deprive the patent holder of the validity and force of the patent (T59).

### **The Defendant's Grievance Concerning the Patent**

[177] I pause at this stage to note the apparent grievance of the Defendant with respect to the patent. It appears that the Defendant has a firm view that he has been dealt with wrongly by, amongst others, Mr McDermott and Mr Haba, the other parties to the Heads of Agreement (Ex 2), in a way that affects the patent. Mr McDermott and Mr Haba are not parties to this litigation, nor are Mr Truskett or Mr Jackson. There is no suggestion that the Defendant has made application to the Commissioner of Patents or the Federal Court of Australia with respect to the question of inventorship and the 2003 patent. In any event, there is no question that PCL was the applicant for the patent at the provisional and final stages and that PCL had assigned the patent to PDC.

[178] To the extent that part of the Defendant's grievance is that the names of three other persons were included as inventors in the standard patent application filed on 18 December 2003, I accept that the law does not require that a co-inventor's contribution to an invention itself be inventive. What should be considered is the contribution made to the invention by the person, such as whether it led to some enhancement that was material and whether the enhancement would have occurred without the person's contribution: Colin Bodkin, "Patent Law in Australia", Law Book Company, 2008, paragraph [8040]. Rights in an invention are determined by objectively assessing contributions in the invention, rather than an assessment of the inventiveness of respective contributions: *JMVB Enterprises Pty Ltd v Camofflag Pty Ltd* [2005] FCA 1474 ; 67 IPR 18 at 93-94 [132] (Crennan J). These statements are supported by the evidence of Mr Redfern, a patent attorney with considerable expertise in the field

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(although not a lawyer). His background in terms of patents is in the field of electrical engineering (T328). His evidence explains how and why the four persons were nominated as inventors in the standard patent application filed on 18 December 2003.

**[179]** It is necessary to keep in mind that the relevant imputation and representation with respect to intellectual property allegations involve assertions that Mr Higgins conspired with others to steal the intellectual property, and that PDC does not own the intellectual property in the Mainline system, or that the validity or efficacy of the patent for the Mainline system was in doubt because the extra inventors' names had been added to the patent.

**[180]** In order to prove the truth of imputation (a) in the first matter complained of, the Defendant must prove that Mr Higgins conspired with others to steal the intellectual property. Mr Higgins denies this allegation (T289-290). The evidence reveals that Mr Higgins met the Defendant in about 2000 in order to invest in a business known as Universal Power Track, and there were subsequent meetings where this topic was discussed. In cross-examination, the Defendant did not put to Mr Higgins that he had conspired with others to steal the intellectual property in the Mainline system from him. There was some cross-examination concerning steps taken by Mr Higgins to undertake what was described as due diligence in 2003, to ensure that PCL owned the intellectual property rights in the invention. Mr Higgins stated that he was assured that this was the case by the law firm which he had instructed to undertake that task (T301).

**[181]** Whatever possible grievances the Defendant may have with other persons who are not parties to this litigation concerning events in 2002-2003, there is no evidence to support imputation (a) with respect to the first matter complained of, which contains the strong allegation that Mr Higgins conspired with others to steal the intellectual property in the Mainline system.

### **Conclusions on Truth of Imputations**

**[182]** With respect to the safety allegations, I accept the submission of the Plaintiffs that the Defendant has not proved the imputations regarding safety. He has not proved that the Mainline system is unsafe, either generally or in the sense of being more dangerous than conventional electrical wiring systems. I accept the submission of the Plaintiffs that the evidence points to the Mainline system being as safe as conventional electrical wiring systems, as well as having significant advantages of convenience.

**[183]** With respect to the intellectual property allegations, I accept the submission of the Plaintiffs that the Defendant has failed to prove his allegations of theft against the First Plaintiff and PDC. It is common ground that the Mainline system is based upon the tendered patent (Ex K). The evidence reveals that PDC took title of the patent from PCL in circumstances where PCL was the registered owner of the patent.

**[184]** I accept the submission of the Plaintiffs that, under patent law, the right to exploit the patent belongs to the holder of the patent, or to any person authorised by the patent holder. It has been established that PCL became the registered holder of the patent upon which the Mainline system is based, and that PCL assigned its rights under that patent to PDC both prior to the granting of the patent (Ex J) and by way of further agreement after the final application was filed (Ex L). In these circumstances, PDC has had, at all material times, full right to exploit the patent upon which the Mainline system is based.

**[185]** The Defendant has failed to establish the defence of justification with respect to either the safety allegations or the intellectual property allegations contained in the relevant imputations.

### **The FT Act Claims**

**[186]** There is very substantial factual overlap between the imputations which are relevant to the defamation claim and the representations which are relevant to the claims under the FT Act. I will return to the facts, for the purpose of making appropriate findings, a little later in this judgment. It is necessary to refer at this point to relevant principles applicable to the claims under the FT Act.

**[187]** I have regard to the FT Act in the form in which it stood in August 2009 and June 2010, the times of publication of the matters complained of. Sections 41, 42, 65, 68 and 72 FT Act have particular application to this case. Those provisions have now been repealed and replaced by substantially identical provisions in the Competition and Consumer Act 2010 (Cth). The new legislation is not retrospective so, in this case, the now repealed provisions of the FT Act apply.

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## Sections 41 and 42 FT Act

[188] Sections 41 and 42 provided relevantly as follows:

- 41 Interpretation  
(TPA s 51A)
- (1) For the purposes of this Part, where a person makes a representation with respect to any future matter (including the doing of, or the refusing to do, any act) and the person does not have reasonable grounds for making the representation, the representation shall be taken to be misleading.
  - (2) The onus of establishing that a person had reasonable grounds for making a representation referred to in subs (1) is on the person.
  - (3) Subsection (1) shall not be taken to limit by implication the meaning of a reference in this Part to a misleading representation, a representation that is misleading in a material particular or conduct that is misleading or is likely or liable to mislead.
- 42 Misleading or deceptive conduct  
(TPA s 52)
- (1) A person shall not, in trade or commerce, engage in conduct that is misleading or deceptive or is likely to mislead or deceive.
  - (2) Nothing in this Part shall be taken as limiting by implication the generality of subs (1).

[189] PDC submits that the Defendant has, in trade or commerce, engaged in conduct that is misleading or deceptive or is likely to mislead or deceive for the purpose of s 42 FT Act.

[190] The following representations are alleged to be with respect to a future matter, so as to attract s 41(1) and (2) FT Act:

- (a) representations (a) and (b) of the first matter complained of; and
- (b) representation (a) of each of the second and third matters complained of.

[191] The following representations are said to relate to existing circumstances at the time of the making of the representation, so that s 41 FT Act has no application:

- (a) representations (c) and (d) of the first matter complained of; and  
representations (b) and (c) of each of the second and third matters complained of.

## Relevant Legal Principles

[192] The relevant legal principles with respect to a claim of this type are not in doubt.

[193] For conduct to be misleading or deceptive, the conduct must convey a misrepresentation: *Taco Co of Australia Inc v Taco Bell Pty Ltd* (1982) 42 ALR 177 at 187. Whether or not conduct amounts to a misrepresentation is a question of fact to be decided by considering what is said and done against the background of all surrounding circumstances: *Taco Co of Australia Inc v Taco Bell Pty Ltd* at 202.

[194] It is not necessary for the Plaintiffs to demonstrate a deceptive intention on the part of the Defendant. The intent of the maker of the representation is not relevant under s 42. All that is relevant is whether, tested objectively, the conduct was misleading or deceptive or likely to mislead or deceive: *Hornsby Building Information Centre Pty Ltd v Sydney Building Information Centre Ltd* [1978] HCA 11 ; 140 CLR 216 at 223. Conduct that objectively leads one into error is misleading: *Butcher v Lachlan Elder Real Estate Pty Ltd* [2004] HCA 60 ; 218 CLR 592 at 626 [111].

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[195] Conduct will be likely to mislead or deceive for the purposes of s 42 if there is a real or not remote chance or possibility of misleading or deception, regardless of whether it is less or more than 50%: *Equity Access Pty Ltd v Westpac Banking Corporation* (1989) 16 IPR 431 at 440. The words "or is likely to mislead or deceive" in s 42(1) make it clear that it is unnecessary to prove that the conduct in question actually deceived or misled anyone: *Butcher v Lachlan Elder Real Estate Pty Ltd* at 626 [112].

[196] Conduct will only be misleading or deceptive if it induces or is capable of inducing error: *Parkdale Custom Built Furniture Pty Ltd v Puxu Pty Ltd* [1982] HCA 44 ; 149 CLR 191 at 198; *Butcher v Lachlan Elder Real Estate Pty Ltd* at 625-626 [111]. Whether particular conduct is misleading or deceptive is a question of fact to be determined in the context of the evidence as to the alleged conduct and to the relevant facts and circumstances: *Butcher v Lachlan Elder Real Estate Pty Ltd* at 625 [109].

[197] The Plaintiffs must establish a causal link between the impugned conduct and the loss that is claimed: *Butcher v Lachlan Elder Real Estate Pty Ltd* at 604 [37].

[198] To fall within s 42(1) FT Act, the relevant conduct must be engaged in "in trade or commerce" . The term "trade or commerce" includes any business or professional activity: s 4(1) FT Act. The term "business" includes a business not carried on for profit and a trade or profession: s 4(1) FT Act.

### **Was the Defendant's Conduct in Trade or Commerce?**

[199] I accept the Plaintiffs' submission that the Defendant's conduct was in trade or commerce within the meaning of the FT Act. In particular, I accept the submission that:

- (a) the matters complained of comprised publications which were intended to be read by, and which were read by, the trading partners or potential trading partners of PDC;
- (b) at all material times, the Defendant was the holder of various patents relating to power distribution technology (for example, Ex 1);
- (c) by the time of the publications, the Defendant was apparently involved in promoting an alternative power distribution technology known as "WiserWire" ;

the content of the first matter complained of was concerned with commercial dealings in which the Defendant had participated, and which were apparently connected with his intellectual property allegation;

each of the matters complained of was explicitly directed to influencing business decisions to deal with PDC and, in the case of the second and third matters complained of, the specific decision whether to distribute PDC's Mainline product.

[200] Further, I accept that the Defendant published the website and the emails as part of his trade or profession as an inventor. He was expressing concern about various aspects of the Mainline system and the effect that the system and its commercialisation might have on his reputation as an inventor. I accept the Plaintiffs' submission that the Defendant's conduct in publishing these matters was part of his ongoing passion as an inventor of electrical conduction systems.

[201] I do not consider that the apparent lack of profit to the Defendant with respect to the conduct surrounding the publications stands in the way of a finding that his conduct was in trade or commerce. The extended definition in s 4 FT Act provides that trade or commerce includes a business or professional activity, even if the business is not carried on for profit.

[202] I accept the Plaintiffs' submission that the present case may be distinguished from a case such as *Plimer v Roberts* (1997) 80 FCR 303 at 304-305 308-311 and 322-329. The free publication of material has been held to constitute conduct in trade or commerce: *Shahid v Australasian College of Dermatologists* [2008] FCAFC 72 ; 168 FCR 46 at 49-51 [4]-[13]. In deciding whether a particular publication is made in trade or commerce, it is important to consider the cumulative significance of the evidence: *Shahid v Australasian College of Dermatologists* at 53 [25].

### **Were the Representations Misleading or Deceptive?**

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**[203]** Insofar as a number of representations by the Defendant relate to future matters, the representation shall be taken to be misleading unless the Defendant had reasonable grounds for making the representation, with the onus of establishing that the Defendant had reasonable grounds lying upon him: s 41(1) and (2) FT Act.

**[204]** Both representations (a) and (b) in the first matter complained of relate to the safety allegation, about which I have made a number of findings adverse to the Defendant earlier in this judgment (at [96]-[155]). Those findings serve to explain my conclusions with respect to these representations as well.

**[205]** Representation (a) in the first matter complained of was that PDC would go into liquidation, leaving its customers responsible for the cost of rewiring their homes. I am satisfied that this representation was made by the Defendant in the website published in August 2009. It is a representation with respect to a future matter. The Defendant has not established, on the balance of probabilities, that he had reasonable grounds for making the representation, with the consequence that it is misleading for the purposes of ss 41 and 42 FT Act.

**[206]** Representation (b) in the first matter complained of was that the Mainline system developed and marketed by PDC was likely to cause avoidable death or injury to children, because it was more dangerous than conventional power conduction systems. I am satisfied that this representation was conveyed by Ex A2. It is a representation with respect to a future matter. The Defendant has not established reasonable grounds for making the representation, with the consequence that the representation was misleading.

**[207]** Representation (c) in the first matter complained of was to the effect that PDC does not own intellectual property in the Mainline system. This is a representation as to an existing state of affairs as at August 2009. It is for PDC to establish, on the balance of probabilities, that the representation was misleading or deceptive or was likely to mislead or deceive. For reasons expressed earlier with respect to the imputations arising from the intellectual property allegations (at [156]-[185]), I am satisfied on the balance of probabilities that this representation is misleading or deceptive. The evidence reveals clearly that PDC owned the intellectual property in the Mainline system.

**[208]** Representation (d) in the first matter complained of states that the intellectual property in the Mainline system produced by PDC was stolen from the inventor. This is a representation as to an existing state of affairs. The onus lies upon PDC to establish that the representation is misleading or deceptive or is likely to mislead or deceive. For reasons expressed earlier in this judgment concerning the defamation imputation arising from the intellectual property allegations (at [156]-[185]), I am satisfied on the balance of probabilities that this representation was misleading or deceptive.

**[209]** I will deal with the second and third matters complained of together. The representations are expressed in identical terms with respect to the two publications.

**[210]** Representation (a) in the second and third matters complained of states that PDC was responsible for the Mainline system which was so dangerous that it would lead to claims for compensation for loss of life, injury or property. This is a representation with respect to a future matter: s 41 FT Act. I am satisfied that the representation is conveyed by the relevant publication. For reasons expressed earlier in this judgment with respect to imputations from the safety allegations (at [96]-[155]), the Defendant has failed to demonstrate that he had reasonable grounds for making the representation. The representation is misleading.

**[211]** With respect to representations (b) and (c) in the second and third matters complained of, each representation relates to an existing state of affairs so that s 41 FT Act has no application. Representation (b) states that PDC had stolen the Defendant's intellectual property in the Mainline system from him. Representation (c) states that the validity or efficacy of the patent for the Mainline system was in doubt because extra inventors' names had been added to the patent. I am satisfied that these representations are conveyed by the relevant publications. For reasons expressed above when dealing with the intellectual property allegations in the context of the defamation claim (at [156]-[186]), PDC has demonstrated, on the balance of probabilities, that each of these representations is misleading or deceptive.

**[212]** In summary, I am satisfied that PDC has established that the Defendant, in trade or commerce, engaged in conduct that was misleading or deceptive with respect to each of the representations relied upon concerning the first, second and third matters complained of.

### **Damages and Injunctive Relief**

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## Damages

[213] The First and Second Plaintiffs have established their cause of action in defamation against the Defendant with respect to each of the pleaded imputations. In determining the amount of damages to be awarded in defamation proceedings, the court is to ensure that there is an appropriate and rational relationship between the harm sustained by the Plaintiffs and the amount of damages awarded: s 34 Defamation Act 2005.

[214] Damages are capped at \$250,000.00 by s 35 Defamation Act 2005 , with the maximum damages amount being increased from 1 July 2010 to the sum of \$311,000.00.

[215] *As Carson v John Fairfax & Sons Ltd* [1993] HCA 31 ; 178 CLR 44 at 60 makes clear, the purposes to be served by an award of damages in defamation are:

- (a) consolation for the personal distress and hurt caused by the publication;
- (b) recompense for harm done to reputation, including business reputation; and
- (c) vindication of the plaintiff's reputation.

[216] With respect to extent of publication, I note that this was not a mass media publication, but was a publication available to the world at large over the internet. Although the initial publication may not have been extensive, the "grapevine effect" would have been such as to do damage to the First and Second Plaintiffs.

[217] In *Palmer Bruyn & Parker Pty Ltd v Parsons* [2001] HCA 69 ; 208 CLR 388 at 416 [88]-[89], Gummow J described the "grapevine effect" in the following way (excluding footnotes):

[88] The expression "grapevine effect" has been used as a metaphor to help explain the basis on which general damages may be recovered in defamation actions; the idea sought to be conveyed by the metaphor was expressed by Lord Atkin in *Ley v Hamilton* as follows:

It is precisely because the "real" damage cannot be ascertained and established that the damages are at large. It is impossible to track the scandal, to know what quarters the poison may reach: it is impossible to weigh at all closely the compensation which will recompense a man or a woman for the insult offered or the pain of a false accusation.

[89] The "grapevine effect" may provide the means by which a court may conclude that a given result was "natural and probable". However, this will depend upon a variety of factors, such as the nature of the false statement and the circumstances in which it was published. The "grapevine effect" does not operate in all cases so as to establish that any republication is the "natural and probable" result of the original publication. This was what was meant by Heydon JA, when his Honour referred to the appellant's submissions being put "as though the grapevine effect was some doctrine of the law, or phenomenon of life, operating independently of evidence". As Heydon JA correctly identified, the appellant can point to no evidence that the "grapevine effect" operated in this case.

[218] As will be seen, there is direct evidence in this case which bears upon damage to reputation. The "grapevine effect" has particular application with electronic publications on the internet, where the publication is available to the world and may be downloaded easily or forwarded as a link to others.

[219] Damage to reputation need not be proved as it is presumed. I accept the Plaintiffs' submission that the seriousness of the imputations in this case would increase the likelihood of damage.

## Damage to Reputations of First and Second Plaintiffs

[220] Mr Sharp gave evidence, which I accept, of his personal history as a member of Federal Parliament for 14 years, and then as a businessman involved in the aviation industry. In the past, he has demonstrated a close interest in public safety as a member of Federal Parliament and in his business life. Mr Sharp did not know the Defendant personally. He found out about the first matter complained of when his personal banker, Mr Krull, telephoned him and drew it to his attention. Mr Krull informed Mr Sharp that the website made alarming and derogatory remarks about the Mainline system and the people involved in it, and he suggested that Mr Sharp "PGoogle" it and read it. He did so, using the search term "Mainline Power" , clicking on "Australia Only" and the matter complained of appeared as the second search result (T259-261).

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[221] On reading the first matter complained of, Mr Sharp believed that the words referring to an ex-Member of Parliament (see [32] above) related to himself as he was the only director who was an ex-Member of Parliament (T261). He formed the view that the publication was saying that the system was more dangerous than conventional systems, and that it endangered school children, and that he cynically sought to promote a product that he knew would fail (T262). Mr Sharp gave evidence that he was "flabbergasted", "offended" and "outraged" that those matters were alleged. He did not think that the product was going to fail.

[222] Mr Sharp gave evidence, which I accept, that he had been contacted by other people who had told him that they had seen the first matter complained of. He said that he often spoke to people about the product and referred them to the PDC website. Approximately 15 or so people had reported to him that they had, in the course of looking for the PDC website, seen the first matter complained of (T264). Mr Sharp said that he had a "sinking feeling" when he heard from these people. That "sinking feeling" was for himself and for PDC, with the company also being damaged by the accusations. He said that all of those people would have known him as a former politician (T266).

[223] Mr Sharp said that he was concerned and assumed that other persons whom he referred to the PDC website, who had not spoken to him since, had also seen the first matter complained of (T266).

[224] The evidence revealed that the Defendant had previously threatened to defame Mr Sharp in an email dated 22 April 2009 (Ex FF), and that he continued to send a raft of emails (including the second and third matters complained of) about the product and PDC from August 2009 until December 2010 (Exs B, C, GG).

[225] Mr Sharp said he had a present concern about the likelihood or prospect of the Defendant continuing to make such publications unless restrained from doing so (T269).

[226] I accept the Plaintiffs' submission that the evidence of Mr Krull demonstrates how easy it was to find the first matter complained of, if a person was looking for Mainline on the internet.

[227] Further evidence concerning Mr Sharp's reputation was given by Mr Webster. His evidence was not challenged and I accept it. He has known Mr Sharp for 27 years, from a time when Mr Sharp was in Federal Parliament and Mr Webster was in the New South Wales Parliament. Since their respective retirements, they have had contact with each other in a business setting.

[228] Mr Webster expressed the view that Mr Sharp had the highest of ethical values and that the first matter complained of was a great slur on his character. Mr Webster considered that the allegations made by the Defendant would be extremely damaging to Mr Sharp in the event that he was nominated for or applied to be a director of a public company. Mr Sharp had spoken to Mr Webster of his hurt as a result of the publication, including his concern about the damage done to his reputation.

[229] It was the evidence of Mr Higgins that he established Mortgage Choice with his brother in 1991. Mortgage Choice is now a substantial business with a current loan book in excess of \$40 billion (T279-280). Mr Higgins gave evidence of his involvement in a number of businesses, including businesses in the agricultural and technology fields. He places high importance on his reputation in those dealings.

[230] The first matter complained of was brought to Mr Higgins' attention in 2009 by Mr Hine, a director of PDC. Mr Higgins understood the website to carry the imputations pleaded and gave evidence that those imputations were false. When he read those allegations, he was shocked. He thought that the allegations were unreasonable and bizarre. He was very angry as he considered that it challenged his ethics and integrity, and he was very concerned that the website damaged his reputation and that of his family (T290).

[231] Mr Taylor has given unchallenged evidence of Mr Higgins' high reputation.

### **Assessment of Damages**

[232] Mr Smark SC drew the court's attention to a number of recent damages awards in defamation cases where the publications did not involve mass media publications. Whilst acknowledging that each case must be considered separately, he submitted that consideration of recent damages awards can be helpful. He referred to the following cases:

- (a) *Huyn v Tang* (District Court of New South Wales, 2003) -- \$140,000.00 for imputations of immigration fraud in notices pinned up in public places;
- (b) *Zarth v Williamson* [2006] NSWCA 246 -- \$80,000.00 for publications to a mortgage company, orally within the hearing of the defendant's own receptionist, and to an officer of the Legal Services Commission, carrying imputations of negligence against solicitors;
- (c) *Trantum v McDowell* [2007] NSWCA 138 -- \$50,000.00 damages for a letter to some 16 tenants about their building's manager, imputing dishonesty and incompetence;
- (d) *SMEC Holdings Ltd v Boniface* [2007] NSWSC 1402 -- from \$75,000.00 to \$120,000.00 (various plaintiffs and publications) for imputations alleging divisiveness, published to a small number of recipients;
- (e) *Martin v Bruce* [2007] NSWDC 1497 -- \$25,000.00 for a publication against club secretary/manager of anonymous broadsheet alleging dishonesty in job application and bad reputation, proof of publication only to four persons;
- (f) *Holmes v Fraser* [2008] NSWSC 570 (overturned on appeal with respect to malice finding, but no appeal on question of damages: *Fraser v Holmes* [2009] NSWCA 36) -- \$70,000.00 for publication to 629 nurses of imputations alleging abuse of position as General Secretary of the Nurses Union;
- (g) *PK v BV (No 2)* [2008] NSWDC 297 -- \$50,000.00 for each plaintiff for a publication to one person of allegation of theft;
- (h) *Webster v Coles Myer Ltd; Thompson v Coles Myer Ltd* [2009] NSWDC 4 -- allegations of dishonesty and fraudulently obtaining gift vouchers published to one to three people (the matter also involved a claim of false imprisonment) -- \$70,000.00 for one plaintiff for defamation and \$50,000.00 for the second plaintiff;
- (i) *Ryan v Premachandran* [2009] NSWSC 1186 -- \$80,000.00 for publication to 14 people -- imputations of incompetence and dishonesty with aggravation.

[233] Mr Smark SC submitted that in this case the range of damages lay between \$70,000.00 and \$150,000.00 for each of the First and Second Plaintiffs.

[234] I have regard to the purposes to be served by an award of damages in defamation (see [215] above). Each of the First and Second Plaintiffs possesses a high reputation in business and related areas. The content of the website published in August 2009 was strongly defamatory of each of them. Mr Higgins was mentioned by name and Mr Sharp, although not named, was clearly and obviously identifiable. I have already found that the website remained available for a period of weeks beyond 7 August 2009.

[235] Although each of Mr Higgins and Mr Sharp were affected by the defamatory publication in somewhat different ways, I am satisfied that the award of damages for each of them ought to be the same figure.

[236] In the circumstances of the case, I am satisfied that an award of damages in the sum of \$100,000.00 each ought to be made in favour of the First and Second Plaintiffs.

### The Third Plaintiff's Claim

[237] PDC is a corporation and its cause of action is confined to that under the FT Act. A claim for damages was made under s 68 FT Act.

[238] The Third Plaintiff claims that it suffered damage to its reputation by reason of the Defendant's misleading and deceptive conduct in contravention of s 42 FT Act. Reference was made to the evidence of Mr Higgins that the publication of the second and third matters complained of was of a nature that was likely to cause damage to the important commercial relationships which PDC had with its distributors in Australia and in the United Kingdom.

[239] The Plaintiffs' written submissions (para 273) invited the court to consider an award of substantive damages under s 68 FT Act, or an award of nominal damages in the event that injunctive and declaratory relief was to be granted, which would prevent the publications from having substantial ongoing harmful consequences to PDC.

[240] Having considered the matter further, Mr Smark SC invited the court, if an entitlement to relief had been otherwise demonstrated, not to proceed to an award of damages under the FT Act in favour of PDC but to proceed, if the court saw fit, by way of a grant of injunctive and declaratory relief (T501-502).

[241] In these circumstances, I will put to one side the claim for damages in favour of PDC under s 68 FT Act.

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## Injunctive Relief

[242] The Plaintiffs seek injunctive relief with respect to the claims in defamation and under the FT Act.

[243] Mr Smark SC acknowledged the long-established reluctance of courts to grant interlocutory injunctions to restrain defamatory publications: *Australian Broadcasting Commission v O'Neill* [2006] HCA 46 ; 227 CLR 57 at 66-67 [16]; *Hatfield v TCN Channel 9* [2010] NSWCA 69.

[244] He submits, however, that this principle had no application in relation to a final injunction and that the public interest is not offended by the restraint of indefensible defamation.

[245] The Plaintiffs submit that, in many cases, damages will be an adequate remedy, leaving no need for a final injunction. However, it was submitted that some defendants may, for a variety of reasons, be likely to publish similar allegations unless restrained, despite having been afforded the opportunity to defend those allegations, and despite having those allegations found by a court of competent jurisdiction to be unwarranted.

[246] In some cases, it was submitted that this may be because a defendant has an irrational view of the truth of the allegations he makes. In others, it may be because he does not take a damages award seriously, perhaps because he may lack substantial resources against which a judgment may be executed. In other cases, a defendant may reveal a disinclination to conform to anticipated findings of the court which may verge on disrespect for legal process.

[247] The Plaintiffs submit that, if a defendant is likely to repeat the defamatory allegations and has failed to prove them true, then he should be restrained from repeating them. If he wishes to do so in the future, the onus will be on him to approach the court and seek to be relieved of the orders, upon adducing admissible evidence that satisfies the court that the orders should not remain in place.

[248] If an injunction is not granted in those circumstances, the Plaintiffs submit that the onus and expense would fall to a plaintiff to commence proceedings again. A plaintiff is not entitled, as a matter of right, to commence such proceedings. In order to do so under the Defamation Act 2005 , by reason of the operation of s 23, a plaintiff must seek the court's leave. It was submitted that this provision, which has not yet been considered by any court, increases the utility of an injunction.

[249] The Plaintiffs submit, in addition, that the FT Act confers a broad discretion on the court to order injunctions and make declarations in relation to misleading or deceptive conduct. Section 65(1)(a) FT Act empowers the court to grant an injunction in relation to contraventions to Pt 5 of the FT Act, which includes ss 41 and 42. Section 72 FT Act empowers the court to make a declaration in relation to conduct that has been found to contravene Pt 5.

[250] PDC sought declarations and injunctions in terms set out in the Further Amended Statement of Claim. However, Mr Smark SC submits, in the event that the court was minded to grant such relief, that the better course may be to frame the precise orders only after the parties had an opportunity to consider the court's reasons for judgment, and to propose draft orders for the court's consideration.

## Decision Concerning Claim for Injunctive and Declaratory Relief

[251] I observe that, at various points in the proceedings, the Defendant invited the court to make a restraining order against him. At one point, when under cross-examination, the Defendant said (T392.40):

I would appreciate it if the Court did put a gag order on me. That protects me.

He made a similar comment in closing submissions (T509.25).

[252] These comments were made whilst the Defendant appeared to be somewhat emotional. The court should not proceed upon the basis that the Defendant had made a considered decision to consent to orders of this type. The appropriate way forward is to consider and determine whether, as a matter of principle and in accordance

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REEL: 028004 FRAME: 0136

with the evidence, the court is prepared to grant injunctive and declaratory relief. If that point is reached, then I will give the parties an opportunity to consider the terms of such relief after reading this judgment.

**[253]** The Plaintiffs submit that the evidence demonstrates that there is a real risk that, even if the Defendant fails in his justification defence and is found to have engaged in misleading and deceptive conduct (as is the case in light of the court's findings), he will continue to repeat the imputations and the representations, thereby further harming the reputations and business of the Plaintiffs.

**[254]** The evidence and my findings reveal that the Defendant has made, and continued to make, strong defamatory and misleading statements concerning the Plaintiffs both before and after this litigation has been on foot.

**[255]** I shall refer to some of the evidence in this respect.

**[256]** On 22 April 2009, the Defendant sent to PDC what can only be described as a volatile and threatening email concerning Mr Sharp (Ex FF).

**[257]** In August 2009, the Defendant published the first matter complained of (Ex A2). Thereafter, the Plaintiffs commenced proceedings against the Defendant on 12 November 2009.

**[258]** Despite the currency of the proceedings, the Defendant persisted in publishing the same allegations on 12 July 2010 (Exs B and C) and in a range of emails sent between 18 August 2009 and 2 December 2010 (Ex GG). The last email in Ex GG was sent by the Defendant, on 2 December 2010, to the principal of a school in Sydney in which the Mainline system had been installed.

**[259]** Other emails were sent by the Defendant between 5 August 2009 and 24 November 2009 to the offices of PDC (Ex HH). As Mr Sharp noted in evidence, a number of these emails were sent to customers or distributors of PDC or to other participants in the company's activities (T268).

**[260]** The Plaintiffs referred to particular emails sent by the Defendant contained in Ex HH, culminating in an email of 24 November 2009 (Ex HH, p 7) which included the following statement:

I cannot thank you enough for bringing the matter before the courts, now all Australia will see you cannot say my motive is money as I have already made it public that I do not want one cent and you can't say it because I am producing WiserWire as I am not ... nor do I intend to ... WiTricity is just around the corner. So what is my motive other than the fact you have produced an unsafe product?

I cannot lose this case before the courts and I think you know that even if the judge finds me guilty, I will still win as all Australia will see and you cannot get blood out of a stone.

**[261]** The Defendant agreed that he had taunted and threatened the Plaintiffs so that they would commence legal proceedings against him (T398, T403-404, T407)

**[262]** When the hearing proceeded, the Defendant relied upon his own evidence. He called no witness to support his case. Having taunted the Plaintiffs to bring the proceedings, the Defendant has failed clearly on the merits.

**[263]** When asked in cross-examination concerning his email of 24 November 2009 (see [260] above), the Defendant said (T412.24):

Q -- And you wrote this: "And you cannot get blood out of a stone." What do you mean by that?

A -- I am unemployed. I've got no money.

Q -- You were there reflecting the fact that money judgments against you, that is, an order for you to pay damages, wouldn't be a deterrent as far as you were concerned?

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**REEL: 028004 FRAME: 0137**



A -- It wouldn't be a deterrent if I can't afford to pay them, no.

**[264]** Although the Defendant denied in cross-examination (T447.8) that he had "built up a deep-seated grievance against PDC and the Mainline system" , I accept that this accurately states his approach to the Third Plaintiff and its product.

**[265]** The Plaintiffs submit that the vehemence of the language of the matters complained of supports the conclusion that the Defendant will continue to defame the Plaintiffs, or engage in misleading conduct concerning them, unless he is ordered not to do so. The Plaintiffs submit that the sanction of damages does not appear sufficient to deter him, and that only the sanctions which may accompany the breach of court orders may have that effect.

**[266]** The Plaintiffs submit that, having regard to the manner in which the Defendant has published material about the Plaintiffs, there is a real prospect that future publications may be surreptitious, and may only come to the attention of the Plaintiffs after substantial harm to their reputations and commercial interest has been caused. It is submitted that an injunction is the best means to deal with such a prospect.

**[267]** The Plaintiffs submit that the grant of such orders would not be unfair or unduly restrictive to the Defendant. They submit that, so far as fairness is concerned, the Defendant has been given every opportunity to defend the allegations which he so fulsomely made against the Plaintiffs. So far as any restriction upon him is concerned, it is submitted that the Defendant would be free in future, should he wish to make some publication which might be thought to breach the orders, to seek the permission of the Plaintiffs, or ultimately to seek the leave of the court, to vary the orders if appropriate.

**[268]** I accept the submissions of the Plaintiffs that the matters complained of, and other communications made by the Defendant with respect to the Mainline system, demonstrate a fixed view on his part accompanied by a desire to repeatedly vent his grievances irrespective of pending court proceedings. The means of communication which the Defendant has utilised are electronic, namely the internet and by email. In various emails, and when before the court at the present hearing, the Defendant has stated that he effectively threatened or taunted the Plaintiffs to bring these proceedings so as to give him an opportunity to ventilate these matters in court.

**[269]** The Defendant has now had the opportunity to do so and has failed clearly to establish the substantial truth of his allegations or to justify the misleading and deceptive representations made by him. The Defendant described himself as being emotional about the subject matter of this litigation (T426.25). It is apparent from his emails, some of which were sent late at night, that he has in the past not been able to restrain himself from communicating with others concerning the subject matter, usually by email.

**[270]** The Defendant's conduct at the hearing supports the view that there is a very real prospect that he will communicate again in the future by email concerning the subject matter of this litigation. He states that he is impecunious so that any damages award is not likely to act as a deterrent.

**[271]** In the unusual circumstances of this case, I am satisfied that a proper foundation has been demonstrated for the grant of injunctive relief with respect to the defamation claim. The reluctance of the courts to grant injunctive relief at the interlocutory stage of defamation proceedings has no application to this case. The matter has proceeded to final hearing and the Defendant has failed comprehensively. The considerations referred to by Mr Smark SC at [245]-[248]) are very much alive in this case. In my view, the response of the law ought be to provide the Plaintiffs with an appropriate level of protection which will flow from a properly and reasonably framed injunctive order.

**[272]** I propose, as well, to grant injunctive and declaratory relief under ss 65 and 72 FT Act. I accept the Plaintiffs' submission (T503) that the Defendant is likely to engage again in misleading and deceptive conduct unless restrained from doing so, and that there is an imminent danger to PDC's business if he does engage in such conduct.

**[273]** I will give the parties an opportunity to consider the terms of any injunction and declaration, consistent with the request made to me at the conclusion of the hearing.

## Conclusion

**PATENT**

**REEL: 028004 FRAME: 0138**

[274] The Plaintiffs have made good their claims in defamation and under the FT Act with respect to each of the imputations and representations pleaded in the Further Amended Statement of Claim.

[275] The Defendant has failed to establish the defence of justification with respect to the claim in defamation.

[276] With respect to the claims in defamation by the First and Second Plaintiffs, I propose to award damages in the sum of \$100,000.00 each in favour of those Plaintiffs.

[277] With respect to the claim by the Third Plaintiff, I decline to award damages, but I will make appropriate orders by way of injunctive and declaratory relief.

[278] I am satisfied that injunctive relief is also appropriate with respect to the defamation claim.

[279] I will allow interest in favour of the First and Second Plaintiffs concerning the monetary judgments to be made in favour of each of them.

[280] The solicitors for the Plaintiffs should draw up short minutes of order to give effect to the foreshadowed orders concerning damages and interest.

[281] I will allow the parties an opportunity to consider this judgment and to make submissions concerning the form of injunctive relief and declaratory orders, together with an opportunity to make submissions on the question of costs.

#### **Order**

Each of the First and Second Plaintiffs to be awarded damages in the sum of \$100,000.00 together with interest.

The Plaintiffs are entitled to appropriate orders by way of injunctive and declaratory relief.

Submissions to be made with respect to the form of injunctive relief and declaratory orders, and on the question of costs.

#### **Annexure A**

The defendant appeared in person.

Counsel for the plaintiffs: *Mr K P Smark Sc and Ms S Chrysanthou*

Solicitors for the plaintiffs: *Doyle Watson Solicitors*

# **Exhibit H to Higgins & Ors v. Sinclair**

[2011] NSWSC 163

**AUSTRALIA**

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**PATENTS ACT 1990**  
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**PROVISIONAL SPECIFICATION**

*FOR THE INVENTION ENTITLED:-*

"AN ELONGATE ELECTRICAL CONDUCTOR THAT IS ADAPTED FOR  
ELECTRICALLY CONNECTING WITH AN ELECTRICAL CONTACT"

The invention is described in the following statement:-

**FIELD OF THE INVENTION**

The present invention relates to an elongate electrical conductor and in particular to an elongate electrical conductor that is adapted for electrically connecting with an electrical contact.

5           The invention has been developed primarily for providing common power and communications lines in domestic, commercial and public buildings and will be described hereinafter with reference to those applications. It will be appreciated, however, that the invention is not limited to those fields of use and is also suitable for providing only power or only communication lines, whether that be in the above  
10 categories of buildings or otherwise.

**BACKGROUND OF THE INVENTION**

Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of common general knowledge in the field.

15           Recent prior elongate electrical conductors are disclosed in US patents 6,309,229 and 6,395,987, both of which are in the name of the present inventor. While the conductors disclosed in these patents provide possible solutions to the problems that are identified in the specification, they are relatively complex and difficult to manufacture, as well as occupying considerable volume for the current carrying capacity that is  
20 accommodated.

These types of conductors are typically formed from a copper sheet and, for a unit length and current carrying capacity, are heavy and therefore relatively expensive and difficult to transport. Moreover, the production of the conductors results in the generation of considerable waste material.

25 **SUMMARY OF THE INVENTION**

It is an object of the present invention to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative.

According to a first aspect of the invention there is provided an elongate electrical conductor that is adapted for electrically connecting with an electrical contact,  
30 the conductor including:

a longitudinally extending elongate body for defining a first contact surface; and

a plurality of longitudinally spaced apart ribs that extend from the body to respective free ends that are spaced apart from the first contact surface for allowing the contact to be progressed between the body and one or more of the ribs, each rib including a respective second contact surface that is opposed with the first surface  
5 wherein, upon progression of the contact between the body and the one or more ribs, the first surface and the respective one or more second surfaces are resiliently biased into engagement with the contact.

In a preferred form, the spacing between the free ends and the first contact surface is greater than the spacing between the first and second contact surfaces.

10 Preferably, the ribs are resiliently mounted to the body. More preferably, the ribs are resilient.

Preferably also, the body is a conductive sheet having two opposite elongate longitudinally extending edges, wherein the ribs extend from one of the edges. In some embodiments, the body includes a further conductive strip that extends from the other of  
15 the edges. The further conductive strip is preferentially used in high current applications.

In a preferred form, adjacent free ends are mechanically connected to collectively increase the resilient bias. More preferably, the adjacent free ends are mechanically connected by respective intermediate integrally formed segments. Even more  
20 preferable, the segments collectively define with the free ends an engagement face for guiding the progression of the contact into biased engagement with the first and second surfaces. In the preferred embodiments, the engagement face is continuous.

Preferably, the engagement face is opposed with and inclined away from the first surface. More preferably, the engagement face extends between an inner edge and an  
25 outer edge that terminates opposite the other edge.

Preferably also, when the first and second surfaces are biased into engagement with the contact, the inner edge abuts the contact. More preferably, the ribs restrain longitudinal movement of the contact.

In a preferred form, the conductor is formed from a continuous conductive sheet  
30 that is folded upon itself along a longitudinal fold line. More preferably, the sheet is punched to form the ribs. However, in other embodiments, the sheet is cut or otherwise formed.

Preferably, the first contact surface is substantially planar and the second contact surfaces are arcuate. In some embodiments the second contact surfaces include a compound arc.

According to a second aspect of the invention there is provided an elongate  
5 electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate first body for defining a substantially planar contact surface; and

a longitudinally extending elongate second body being mounted to the first body  
10 for defining an arcuate contact surface that is opposed with the planar surface wherein, upon progression of the contact between the first and second bodies, the planar and the arcuate surfaces are resiliently biased into engagement with the contact.

Preferably, the arcuate contact surface is segmented. More preferably, the second body includes a plurality of longitudinally spaced apart ribs that extend from the  
15 first body to respective free ends which collectively define the arcuate surface. Even more preferably, the free ends are mechanically connected. In the preferred embodiments the free ends are mechanically interconnected by respective intermediate integrally formed segments.

Preferably, the first body is substantially planar and includes two opposite faces,  
20 one of which defines the planar contact surface. More preferably, the second body is arcuate and includes opposite convex and a concave faces, the formed defining the arcuate contact surface.

According to a third aspect of the invention there is provided a conduit for an elongate electrical conductor that is adapted for electrically connecting with an electrical  
25 contact, the conduit including:

a longitudinally extending housing;

one or more mounting formations disposed within the housing for captively retaining the conductor to the housing;

an opening in the housing for receiving the contact and thereby allowing the  
30 contact to be brought into engagement with the conductor; and

a closure that is mounted to the housing for moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening respectively.

5 Preferably, the closure is mounted to the housing for rotation between the open and closed configurations. More preferably, the closure is hinged to the housing. Even more preferably, the closure is resiliently biased toward the closed configuration. In some embodiments, the closure includes a longitudinal line of weakness about which it is resiliently deformed from the closed configuration.

10 Preferably also, the contact is part of a contact assembly and, as the assembly is progressed into the opening, the closure is moved toward to open configuration. More preferably, the contact assembly engages the closure to effect progression toward the open configuration.

15 In a preferred form, the mounting formation is a retaining channel that extends continuously through the housing. More preferably, the channel includes a continuous open end for receiving the contact. More preferably, the open end is downwardly facing. In the preferred embodiments, the open end defines the bottom of the channel.

20 Preferably, the housing includes a plurality of spaced apart channels for captively retaining respective conductors. More preferably, the channels are parallel. In the preferred embodiment, the channels longitudinally coextend and are transversely spaced apart.

Preferably also, the housing is extruded.

25 In a preferred form, the closure, in the closed configuration, extends across the opening. More preferably, the opening extends longitudinally and the conduit includes a plurality of closures that, in the closed configuration, collectively extend longitudinally across substantially all of the opening. Even more preferably, movement of one closure between the open and closed configuration occurs independently of movement of any other of the closures. In the preferred embodiment the closures are modular.

30 Preferably, the closure is mounted inside the housing and, in the closed configuration, extends upwardly from the housing and across the opening. More preferably, the closure is hinged at or adjacent to the housing wherein the movement between the open and closed configurations occurs within the housing. In the preferred embodiments, the opening includes two opposite edges and the closure extends from a



mounting end that is hingedly engaged with the housing adjacent to one of the opposite edges, to a free end that, in the closed configuration, is disposed adjacent to the other of the opposite edges.

5 Preferably also, the mounting formation includes a locating formation for orientating the conductor for resilient deformation upon engagement with the contact. More preferably, the conductor includes a plurality of engagement faces for engaging with the contact, and the locating formation orientates the engagement faces for resiliently deforming into engagement with the contact. Even more preferably, the locating formation is a protrusion that extends from the mounting formation.

10 In other embodiments, the mounting formation includes a channel having an open end defined by the opening. More preferably, the opening is downwardly facing. Even more preferably, the closure is a flap that, in the closed configuration, extends across substantially all of the opening and which is resiliently deformed by the contact into the open configuration.

15 According to a fourth aspect of the invention there is provided a conduit for an elongate electrical conductor having two opposed engagement elements that are adapted for electrically connecting with an electrical contact, one of the elements being substantially planar and the other being arcuate, the conduit including:

a longitudinally extending housing;

20 one or more mounting formations disposed within the housing for captively retaining the conductor to the housing;

an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

25 one or more locating formations associated with the mounting formations for orientating the conductor to ensure that the substantially planar engagement face is inclined with respect to the contact.

Preferably, the conduit includes a closure that is mounted to the housing for moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening.

30 Preferably also, the arcuate engagement face includes a compound arc.

In a preferred form, the mounting formations captively retain the conductor within the housing. For typical domestic AC voltages this is required to ensure for the

safety of persons in the vicinity. However, for low voltage DC applications the design of the conduit is able to accommodate the conductor being partially or substantively disposed outside of the housing.

According to a fifth aspect of the invention there is provided a conduit for an  
5 elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conduit including:

a longitudinally extending housing;

an open ended channel disposed within the housing for captively retaining the conductor within the housing;

10 an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

a closure that is disposed within the housing adjacent to the open ended channel for moving between a closed configuration and an open configuration for providing a barrier to unintended access to the conductor.

15 Preferably, the closure is moved into the open configuration when the contact is brought into engagement with the conductor. More preferably, only that portion of the closure adjacent to the contact is moved into the open configuration.

According to a sixth aspect of the invention there is provided a contact assembly for electrically connecting with a plurality of conductors contained within a conduit, the  
20 contact including:

a housing that is movable into engagement with the conduit; and

a plurality of contact formations mounted to the housing and which are movable into engagement with respective conductors in a predetermined sequence.

25 Preferably, the housing is movable into releasable engagement with the conduit and the contact formations are movable into releasable engagement with the respective conductors.

30 Preferably also, the contact formations include at least two pins, wherein one of the pins protrudes further from the housing than the other. More preferably, the contact formations include three parallel pins that extend transversely from the housing and terminate at free ends that are transversely spaced apart.

In a preferred form, the contact includes at least two parallel pins and the relative transverse offset between the pins and the respective conductors is such as to provide the predetermined sequence.

5 Preferably, the contact assembly includes an active pin and a neutral pin, and the predetermined sequence comprises the neutral pin and then the active pin engaging the respective conductors. More preferably, the contact assembly includes an active pin, a neutral pin and an earth pin, and the predetermined sequence comprises the earth pin and then the neutral pin and the active pin engaging the respective conductors. Even more preferably, the neutral pin and the active pin substantially simultaneously engage with  
10 respective conductors. In other embodiments, however, the predetermined sequence comprises the earth pin and then the neutral pin and then the active pin engaging the respective conductors.

Preferably also, the pins are movable out of engagement with the respective conductors, that movement occurring in the reverse of the predetermined sequence.

15 According to a seventh aspect of the invention there is provided an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate conductive sheet having a first face and a second face opposite to the first face, wherein the first face defines a first contact  
20 surface; and

a plurality of longitudinally spaced apart ribs that extend transversely from the sheet and back along at least a portion of the first contact surface but not along the second face, each rib including a respective second contact surface wherein, upon progression of the contact between the sheet and the one or more ribs, the first surface  
25 and the respective one or more second surfaces are resiliently biased into engagement with the contact.

Preferably, the faces are joined along a first common longitudinal edge and a second common longitudinal edge and the ribs extend from the first edge and terminate in respective free ends. More preferably, the second contact surfaces are disposed  
30 intermediate the first edge and the respective free ends. Even more preferably, the free ends terminate between the first and second edges. In some embodiments the free ends

extend beyond the second edge. However, the free ends do not extend around the second edge.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Preferred embodiments of the invention will now be described, by way of  
5 example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a conduit according to the invention in combination with a contact assembly, also according to the invention, that is mounted to the conduit in a movable configuration;

Figure 2 is a perspective view of the contact assembly of Figure 1;

10 Figure 3 is an enlarged view of the conduit and contact assembly of Figure 1, with the contact in an operative configuration;

Figure 4 is an enlarged side view of the conduit of Figure 1;

Figure 5 is a side view of the conduit and contact assembly of Figure 3;

15 Figure 6 is an enlarged side view of the conduit and the contact assembly as they are moved relative to each other and from the movable configuration toward the operative configuration;

Figure 7 is a side view similar to Figure 6 with the conduit and contact assembly in the operative position;

20 Figure 8 is a cut-away rear perspective view of the conduit and contact assembly intermediate the operative and movable configurations;

Figure 9 is an enlarged side view of the conduit of Figure 1 illustrating a movable closure in a closed configuration;

Figure 10 is a view similar to that of Figure 9 showing the closure in the open configuration;

25 Figure 11 is a side view of a conductor according to the invention;

Figure 12 is a perspective view of the conductor of Figure 11;

Figure 13 is a cross sectional view of a roll of conductors of Figure 11;

Figure 14 is a side view, similar to Figure 11, of a high current rated conductor according to the invention;

30 Figure 15 is a perspective view of the conductor of Figure 11 extending between two conduits of Figure 1;

Figure 16 is a perspective view of the conductor at an intermediate stage of its manufacture; and

Figure 17 is a side view of the contact assembly of Figure 1 showing the contact formations.

## 5 DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1 to 10 and Figures 15 and 17, and particularly to Figures 1, 4 and 17, there is illustrated an elongate insulating conduit 1 for three generally parallel elongate electrical conductors 2, 3 and 4 that are adapted for electrically connecting a contact assembly 5 having corresponding electrical contacts in the form of pins 7, 8 and 9. Conduit 1 includes a longitudinally extending extruded plastic housing 11 of substantially consistent cross-sectional shape. Three open-ended channels 12, 13 and 14 are disposed within housing 11 for captively retaining respective conductors 2, 3 and 4 within the housing. An elongate longitudinally extending opening 15 in housing 11 receives assembly 5 and thereby allows pins 7, 8 and 9 to be brought into engagement with respective conductors 2, 3 and 4. As best shown in Figure 4, two resiliently deformable plastics closures 17 and 18 are disposed within housing 11 adjacent to open ended channels 13 and 14 for moving between a closed configuration, as shown, and an open configuration for providing a barrier to unintended access to conductors 3 and 4.

Housing 11, in this embodiment, is a three-piece construction and includes a rigid plastics mounting bracket 21 that is attached to a wall or other support element that the housing is to extend along or between. The attachment, in this embodiment, is by a plurality of longitudinally spaced metal screws 22 that extend through apertures (not shown) in bracket 21. In other embodiments, the attachment is affected by other devices, for example, bolts, adhesive, rivets and the like.

Bracket 21 includes a rear plate 23, a base 24 that extends forwardly from the bottom of plate 23, and a front plate 25 that is extends substantially normally from base 24. Plate 23 includes a snap-lock fitting 26, while plate 23 and base 24 collectively define a retention channel 27.

Plate 23, base 24, plate 25, fitting 26 and channel 27 are integrally formed.

Housing 11 also includes an extruded plastic front bracket 28 having a front plate 29 that is spaced apart from and extends in the same plane as plate 25 for defining opening 15. A rigid wall assembly 30 extends rearwardly from plate 29 and, together

with that plate, define channels 12, 13 and 14. Assembly 30 also includes a snap-lock fitting 31 and a locking post 32 that respectively complementarily interact with fitting 26 and channel 27.

Plate 29, assembly 30, fitting 31 and post 32 are integrally formed.

5 Channels 12, 13 and 14 include respective retention protrusions in the form of pairs of opposed longitudinally extending ridges 35 and 36 that extend toward each other to define the open end of the respective channels. These ridges retain conductors 2, 3 and 4 in the respective channels, and include lower bevelled edges to guide pins 7, 8 and 9 into the channels.

10 The channels also include mounting formations, in the form of respective abutments 37 and recesses 55, that shape the interior of the channels for ensuring the respective conductors are inclined with respect to the pins. This functionality will be described in more detail below.

Base 24 includes a mounting formation in the form of a longitudinal channel 38  
15 that coextends with housing 11 and which includes pairs of spaced apart internal abutments. An extruded plastic closure 39 extends within housing 11 for movement between an open configuration, as shown in Figure 4, and a closed configuration, as shown in Figure 9. Closure 39 has a longitudinal length of about 50 mm and includes a support formation, in the form of a ribbed spigot 40, that is complementarily fixedly  
20 mounted within channel 38 in an interference fit.

Closure 39 also includes a shutter 41 that is hinged to spigot 40 for movement between the open configuration, where the shutter is substantially horizontal, and the closed configuration, where the shutter is substantially vertical. The free end of shutter 41 includes an integrally formed peak 42 that extends normally away from the shutter to  
25 provide additional resistance to ingress of unwanted items into housing 11.

The longitudinal length of housing 11 varies depending upon the site in which it is installed. Typically, that longitudinal length is in the range of about 150 mm to many tens of metres. In other embodiments, however, smaller or greater lengths are used where the installation requires. Accordingly, as closure 39 is about 50 mm in length, the  
30 preferred embodiments make use of a plurality of like closures that, in the closed configuration, collectively and substantially extend across all of opening 15. In those

embodiments where the longitudinal length of housing 11 is not an integral multiple of the length of closure 39, one or more of the closures are trimmed to size.

Shutter 41 is resiliently biased into the closed configuration, and progressed into the open configuration as assembly 5 is progressed into aperture 15. As assembly 5 will  
5 at any one time engage, at most, two adjacent shutters, the other shutters will remain in the closed configuration and thereby continue to obstruct the ingress of dirt, dust, and other items into housing 11.

In some embodiments closure 39 is omitted. In other embodiments, closure 39 is integrally formed with base 24.

10 It should be noted that the closure has also been omitted from some of the drawings, although this is primarily for the purposes of clarity in illustrating other features of the preferred embodiments.

Housing 11 is formed in a continuous length, and cut to size for the installation being undertaken. Additionally, conductors 2, 3 and 4 are also continuous. If necessary,  
15 discontinuous housings and conductors are used, although this is generally less preferred.

The continuous nature of housing 11 and conductors 2, 3 and 4 allow assembly 5 to be received within opening 15, and pins 7, 8 and 9 engaged with respective conductors 2, 3 and 4 at any longitudinal position along housing 11. As will be  
20 described below, assembly 5 is therefore able to be positioned, as required. While in some embodiments assembly 5, once positioned, is fixed, in most embodiments assembly 5 is releasably engaged with the conductors and movable, as desired. This provides considerable flexibility in design and placement of assembly 5 and, hence, considerable flexibility in placement of electrical apparatus that connect with assembly 5  
25 to draw power from one or more of the conductors or to transmit and/or receive data via one or more of the conductors.

Assembly 5 includes a generally cylindrical insulating plastic body 45 that coaxially and rotatably supports a circular front face 46. This face has a plurality of apertures arranged in a predetermined orientation corresponding to the standard socket  
30 configuration for the jurisdiction concerned. In the illustrated embodiment face 46 includes three apertures in the UK format. Contained within body 45 and behind the apertures are sprung electrical contacts (not shown) for engaging with respective pins of

a complementary electrical plug when those pins are received within the apertures.

These contacts, in turn, are electrically connected to respective pins 7, 8 and 9. In this embodiment pin 7 is the earth pin, pin 8 is the active pin, and pin 9 is the neutral pin of a single-phase 240 Volt supply system.

5           Body 45 supports an intermediate annular adjustment band 47 that is mechanically connected to face 46 for allowing manual relative rotation between body 45 and face 46 between a movable configuration, as shown in Figure 1, to an operative configuration, as shown in Figure 3. The rotation is about a common axis 48.

          Pins 7, 8 and 9 are directly mechanically connected with band 47 via an axle 49  
10          that is coaxial with axis 48. These pins extend radially from the axle and therefore also rotate through a 90° arc as the band is rotated by 90° relative to body 45. In the movable configuration, pins 7, 8 and 9, while located within housing 11, are parallel with and spaced apart from the conductors and, as such, assembly 5 is longitudinally movable along opening 15. In the operable configuration, however, the pins are normal to and  
15          engaged with the respective conductors and, as such, assembly 5 is restrained against longitudinally progression along opening 5. To further illustrate, reference is made to Figure 5, where assembly 5 is in the operable configuration. As shown, pins 7, 8 and 9 extend vertically from axle 49 and are engaged at their free ends with respective  
          conductors.

20           In other embodiments the pins rotate through other than 90° to progress between the movable and operable configurations. Moreover, in some embodiments, there is a mechanical link including gearing operable between band 47 and axle 49. Typically, the gearing is a reduction gearing to provide mechanical advantage to any manual input. While this necessitates, in some embodiments, the rotation of band 47 through more than  
25          90°, it also allows a greater clamping force between pins 7, 8 and 9 and respective conductors 2, 3 and 4 while containing the manual power required to be exerted. In general terms, the greater the clamping force between the pins and the respective conductors, the better quality the electrical contact and therefore the lower the resistance of the contact. This is particularly important for communication signals, as there contain  
30          high frequency components that are more susceptible to degradation due to poor contacts.



Band 47 includes a lever 50 that extends radially outwardly from the band. This lever provides mechanical assistance to a user when manually progressing the band between the operable and movable configurations. In other embodiments, band 47 includes a predetermined arrangement of engagement formations (not shown) for inter-  
5 engaging with a complementarily shaped tool.

In use, bracket 21 is cut to the required longitudinal length and attached via screws 22 to an adjacent support surface, typically a wall, floor or ceiling. Bracket 28 is cut to the same length and continuous conductors 2, 3 and 4 are inserted into channels 12, 13 and 14. Post 32 is then placed in channel 27, and bracket 28 rotated so as to bring  
10 fittings 26 and 31 into snap-locked engagement and thereby fixedly retain brackets 21 and 28 together.

Assembly 5, with band 47 rotated into the movable configuration, is presented to conduit 1 in the approximate desired longitudinal location on that conduit. Pins 7, 8 and 9 and axle 49 are then progressed through opening 15. As this occurs, axle 49 engages the  
15 adjacent shutter 42 and progresses it from the closed configuration to the open configuration. Only the shutter engaged by axle 49 will be progressed to the open configuration, the remaining shutters will remain in the closed configuration.

Assembly 5 is then longitudinally progressed along opening 15 until the final positioning with respect to conduit 1 is determined. If the assembly is progressed  
20 longitudinally beyond the initially engaged shutter to a subsequently engaged shutter, the initially engaged shutter automatically returns to the closed configuration, while the subsequently engaged shutter progresses to the open configuration. In this embodiment, the shutters are resiliently biased toward the closed configuration.

With the location of assembly 5 determined, the user manually rotates band 47 to  
25 progress the pins from the movable configuration into the operable configuration of Figures 5 and 7. It will be appreciated that closures 17 and 18 are resiliently deformed where they are adjacent to respective pins 8 and 9. Otherwise, those closures remain as a barrier to ingress into channels 12, 13 and 14 of contaminants or unintended items.

Figures 8 and 17 illustrate the pins intermediate the movable and the operative  
30 configurations. With particular reference to Figure 17, it will be understood that as the pins rotate they engage with the respective conductors in a predetermined sequence. In this embodiment, as the pins move from the movable configuration to the operable

configuration that sequence includes the first contact being made between pin 7 and conductor 2, and subsequent simultaneous contact being made between pin 8 and conductor 3 and pin 9 and conductor 4 respectively. In other embodiments, pin 9 and conductor 4 are configured to make contact prior to the contact between pin 8 and conductor 3.

It will also be appreciated that, in this embodiment, pin 7 is an earth pin and is always the first pin to contact the respective conductor, and the last pin to be in contact with the respective conductor.

The sequential engagement of the pins with the respective conductors also reduces the maximum manual forces required to rotate band 47.

During movement of the pins from the operable configuration, the breaking of the contacts between the pins and the conductors is the reverse of the predetermined sequence.

It will be appreciated, from the teaching herein, that the predetermined sequence for a given embodiment having co-radial pins of equal thickness is determined by the relative lengths of the pins and the relative offset between the conductors in the direction that the length of the pins is measured. In other embodiments the same effect is achieved by radially offsetting the pins on axis 49, or by having pins of a different radial width.

In practice, conduit 1 supports a plurality of spaced apart like assemblies 5 (not shown) which provide significant design flexibility. Moreover, if, with time, it is desired to longitudinally re-position one or more of assemblies 5, band 47 is progressed to the movable position. Thereafter, assembly 5 is either longitudinally translated along opening 15, or removed from opening 15 altogether and reinserted at the desired location. In any event, once the positioning at the desire location is affected, band 47 is once again returned to the operative configuration and assembly 5 is once again operatively connected with the conductors.

That is, as the power and communication requirement of a building, or room within that building, change, conduit 1 allows the location of the power and communication outlets to be quickly and easily modified to accommodate any change in the required functionality.

Reference is now made to Figures 11 and 12, which specifically illustrate conductor 2. It will be appreciated that conductors 3 and 4 are of the same construction and offer the same functionality as conductor 2 and, as such, will not be described separately. As discussed above, conductor 2 is longitudinally elongate and is adapted for electrically connecting with an electrical contact in the form of pin 7. Conductor 2 includes a longitudinally extending elongate metal conductive body in the form of a copper sheet 61 for defining a first substantially planar contact surface 62 and an opposite face 63 that meet at common parallel longitudinal edges 64 and 65. A plurality of longitudinally spaced apart resiliently deformable ribs 66 extend from sheet 61 to respective free ends 67 that are spaced apart from the surface 62 for allowing pin 7 to be progressed between sheet 61 and one or more of ribs 66. Each rib includes a respective arcuate contact surface 68 that is opposed with surface 62 wherein, upon progression of pin 7 between sheet 61 and the one or more ribs 66, surface 62 and the respective one or more surfaces 68 are resiliently biased into engagement with the pin.

In the configuration shown in Figure 11, the spacing between ends 67 and surface 61 is greater than the spacing between surfaces 62 and 68.

All of ribs 63 extend from edge 64 to allow edge 65 and ends 67 to collectively define an opening 69 for receiving pin 7.

Ribs 66 extend transversely away from edge 64 and back along substantially all of surface 62. The ribs do not extend at all along face 63 and, hence, minimise the required transverse thickness of conductor 2.

Adjacent ends 67 are mechanically and electrically connected to collectively increase the resilient bias between surfaces 62 and 68 when engaged with pin 7. In this embodiment, adjacent ends 67 are mechanically connected by respective intermediate integrally formed segments 70. These segments have respective top edges 71, and bottom edges that extend between and which lie flush with ends 67. Segments 70 collectively define with ends 67 an engagement face 72 for guiding the progression of pin 7 into biased engagement with surfaces 62 and 68. In this embodiment, face 72 is substantially planar, continuous and opposed with and inclined with respect to surface 62. In other embodiments, face 72 is arcuate.

Segments 70 allow conductor 2 to have a higher clamping force upon pin 7 as the clamping bias is provided not only by those ribs that are in direct contact with the pin,

but also the adjacent ribs. Moreover, with pin 7 in the operative position, it will be in direct contact with surface 68 of one or two of the ribs. The immediately adjacent ribs, however, will bias the edges 71 into abutment with the longitudinal edges of pin 7, and thereby further retain that pin in the operative position. That is, conductor 2 offers both  
5 clamping and a mechanical locking of pin 7 in the operative position. This effect is best shown in Figure 7.

It will be appreciated that in other embodiments surfaces 68 include a compound arc.

Sheet 61 is the primary current carrying component of conductor 2. While some  
10 current inevitably flows along a path defined by ends 67 and segments 70, this is typically less than that flowing through sheet 61. The primary function of ribs 66 and intermediate segments 70 is to provide clamping and locking engagement with pin 7 and to otherwise ensure it is secured in good electrical contact with sheet 61.

Sheet 61 extends substantially along a plane and surface 62 is substantially  
15 planar to provide a large contact area between surface 62 and the adjacent opposed planar surface of pin 7. It will be appreciated that this area is far greater than the contact area between surface 68 and the adjacent surface of pin 7. This asymmetry also allows the transverse width of conductor 2 to be minimised. Moreover, less regard need be had to the current capacity of ribs 66 – in that the dimensions of the ribs is not critical – as  
20 less reliance is placed upon this current path. Rather, the highly conductive, continuous and regularly shaped sheet 61 offers a high quality low resistance current path, while ribs 66 are intended more for optimising the electrical engagement of the pin with surface 62.

Conductors 2, 3 and 4 are continuous to provide as low a resistance path as  
25 possible. This is also important for higher frequency signals, as discontinuities such as joints can provide sites for signal reflections and thereby compromise the data being communicated. Typically, the conductors are longer than conduit 1, and extend between adjacent like conduits. For example, reference is made to Figure 15 where two conduits 1 are mounted to respective support surfaces (not shown) and extend normally away  
30 from each other. Conductors 2, 3 and 4 extend continuously through and between both conduits 1. Moreover, the conductors accommodate bending or folding about a vertical

axis (or axes). While the uniform bend in each conductor shown in Figure 15 extends through a total of 90°, in other embodiments alternative bends are accommodated.

It will also be appreciated that conductors 2, 3 and 4 are able to longitudinally slide in respective channels 12, 13 and 14. This is particularly important where bends such as that shown in Figure 15 are concerned, as the radius of the bends required is different for each conductor. This longitudinal sliding within the channels allows each conductor to progress to the least stressed position, and thereby best ensure that the bend is uniform. This absence of kinking and distortion of the conductors minimises any risk of degrading the conductor's mechanical performance – due to, for example, point loading – and electrical performance – due to, for example, creating a reflection site for high frequency signals.

Although Figure 15 illustrates the exposed conductors as they extend between adjacent conduits 1, in practice an intermediate corner conduit or bend conduit is used to provide continuous encasement of conductors 2, 3 and 4.

Bending and folding of conductors 2, 3 and 4 about the vertical axis is possible due to the substantially planar sheets 61, and the spaced apart ribs 66. It will be appreciated that such bending or folding does, in some cases, result in some buckling of segments 70 and ribs 66. While this is preferable avoided, it has been found in practice that this is not critical for domestic power applications as sheet 61 is the main current carrier. In circumstance where more extreme bending or folding is used, it is also possible to buckle sheet 61 or to bring sheet 61 into engagement with ribs 66. In the event that the conductors need only convey power, and not communications signals, then such buckling is rarely problematic, as assembly 5 is typically only mounted to conduit 1, not to an intermediate conduit.

Conductors 2, 3 and 4 are introduced into the respective channels by being feed into the longitudinal ends of conduit 1. However, in other embodiments, the conductors are introduced into respective channels 12, 13 and 14 by progressing through the open ends, in that they are resiliently deformed as they past ridges 35 and 36. The typical end result being, for the example of conductor 2, that edge 65 and end 67 are adjacent to the upper side of ridges 35 and 36. Due to manufacturing tolerances and other factors it is not unusual for only one of edge 65 and end 67 to be engaged with the respective ridges. In fact, this is a design feature of conduit 1 and conductor 2 to ensure that sheet 61 is

inclined from the plane through which pin 7 rotates. As will be appreciated from the foregoing description, in this embodiment pin 7 rotates in a vertical plane.

While conductors 2, 3 and 4 are retained within the respective channels, they do have a limited degree of freedom for movement. Particularly, the inclusion and  
5 placement of recess 55 encourages conductor 2, in the absence of pin 7, to rest under the influence of gravity such that sheet 61 is inclined by a small amount from the vertical. The inclination is such that end 67 is lower than edge 65. When pin 7 is first progressed past ridges 35 and 36 and into channel 12, its leading edges contact conductor 2. Specifically, one leading edge of pin 7 contacts surfaces 62 adjacent to edge 65, and the  
10 other leading edge contacts surface 72. Those contacts need not necessarily initially occur simultaneously. While this action of pin 7 may cause some upward movement of conductor 2, the contact with surface 62 causes conductor 2 to rotate slightly within channel 12 such that face 63 is brought into engagement with abutment 37. The engagement with abutment 37 occurs adjacent to edge 64 and, as such, sheet 61 is  
15 supported along face 63 at only two spaced apart points, these being at edge 64 – which is engaged with abutment 37 – and at edge 65 – that is abutted against the adjacent wall of channel 12. Accordingly, sheet 61 and surface 62 remain inclined with respect to the vertical.

As pin 7 is further advanced into channel 12, it drives between surface 62 and  
20 face 72 to resiliently deform ribs 66 such that surfaces 62 and 68 are moved apart to allow progression of pin 7 into channel 12. As that progression occurs, the leading edge of pin 7 that is engaged with surface 62 slideably progresses along that surface toward edge 64. Moreover, that leading edge, being disposed intermediate edges 64 and 65, resiliently deforms sheet 61 toward the adjacent wall of channel 12 to further facilitate  
25 the movement apart of surfaces 62 and 68.

Once the leading edges of pin 7 have progressed from end 67 and past surface 68, the deformation of sheet 61 is such as to bring surface 62 into contact with the adjacent surface of pin 7. In any event, once the leading edges of pin 7 extend to or slightly beyond edge 64, sheet 61 returns to the substantially planar configuration to  
30 establish the large contact area between the pin and surface 62.

During the progression of pin 7 into channel 12, ribs 66 are deformed to make way for that progression between surfaces 62 and 68. However, the ribs maintain

surfaces 62 and 68 in a resilient clamping bias with pin 7. While sheet 61 is being resiliently deformed the bias will be reduced. However, with pin 7 in the operative position, and surface 62 intimately electrically connected with that pin, the bias will be at a maximum as sheet 61 is, in that configuration, substantially planar and un-deformed.

5 Channel 12 and conductor 2 also interact such that end 67 of conductor 2 is abutted with the adjacent wall of the channel during the progression of pin 7 into the channel. Additionally, recess 55 ensures that rib 66 does not otherwise engage with that wall of the channel. In this situation, end 67 acts as a lever for applying additional clamping bias between surfaces 62 and 68 and the intermediate pin 7. It also enhances  
10 the probability of a large contact surface area between surface 62 and pin 7. An additional advantage is that the ribs adjacent to the rib or ribs that directly engage with pin 7 are resiliently urged toward sheet 61 and thereby contribute to locking pin 7 in the operative position.

When pin 7 is rotated from the operative to the movable configuration it is  
15 necessary to overcome the clamping and locking forces that have been applied by conductor 2. However, once this occurs, the sequence of events is substantially the reverse order of that described above.

Some embodiments of the invention are intended for high current applications. One example is a conductor 75 that is illustrated in Figure 14, where corresponding  
20 features are denoted by corresponding reference numerals. Sheet 61 includes a conductive copper strip 76 that is integrally formed with and which extends from edge 65 to overlap with all of face 63. In this embodiment strip 76 extends beyond edge 64. Although a gap is shown between sheet 61 and strip 76, it is preferred that this is minimised or eliminated.

25 In other embodiments, strip 76 terminates intermediate edges 64 and 65. In further embodiments, strip 76 is folded back upon itself one or more times.

Conductors 2, 3 and 4 are each formed from a continuous conductive sheet. By way of example, a preferred method of manufacturing conductor 2 will be provided below with reference to Figure 16. It will be appreciated by those skilled in the art that  
30 the other conductors are preferably manufactured with the same steps.

Initially, use is made of a longitudinally continuous copper sheet 81 having a nominal thickness and width of about 0.35 mm and 18 mm respectively. This is

sufficient to provide, in the finished product, a 20 Amp current carrying capacity at 240 Volts AC, along with the required clamping force.

Sheet 81 is significantly smaller than the corresponding sheet used to produce the prior art device. Accordingly, the raw material costs for the preferred embodiment, for  
5 the same current carrying capacity, is considerably less than that offered by the prior art. It also ensures, that for a given length of conductor, that conductor 2 will weigh less than the prior art and, hence, will be less expensive to not only obtain the raw materials, but also to transport the final product for installation.

This sheet is cleaned and then punched to form an array of asymmetric disposed  
10 longitudinally spaced apart generally rectangular apertures 82. This arrangement is illustrated in Figure 16. The punching operation also introduces four parallel broken lines of weakness 83, 84, 85 and 86 that extend longitudinally between the apertures. It will be appreciated that the metal remaining between adjacent apertures is to ultimately define ribs 66.

Sheet 81 is then again cleaned and a flexible plastic sheet 87 is adhered to one  
15 face of sheet 81. As sheet 81 is of considerable length, it is usual for a plurality of adjacent sheets 87 being used to collectively cover upward face of sheet 81. Sheet 87, in this embodiment, is made from a flexible resilient plastic sheet and:

1. Provides an electrically insulating and protective cover for the resultant  
20 conductor.
2. Facilitates the introduction of the conductor into channel 12 by reducing the likelihood of inadvertent and undesired binding engagement between the ribs and the adjacent channel walls.
3. Provides additional structural integrity to the conductor.
- 25 4. Contributes to the formation of constant radius curves between adjacent conduits that are angled with respect to each other.
5. Reduces the risk of entanglement or undesired snagging between adjacent coils of the resultant conductor when included in a multi-layer coil.

In other embodiments, sheet 87 is a laminate. One embodiment (not shown)  
30 includes a three layer flexible laminate having:

1. An outer plastic layer for providing the functionality referred to above;
2. An inner adhesive layer for adhering sheet 87 to conductor 2.



3. An intermediate conductive layer, such as a conductive foil, for providing electromagnetic shielding.

Sheet 81 is mandrel bent between lines 85 and 86 to define end 67 and the inclined face 72. A further mandrel bend is affected along a longitudinal central fold line that is parallel with and intermediate lines 83 and 84. The bend along the central  
5 fold line is such as to fold sheet 81 by 180° so that it extends back upon itself to form conductor 2, as shown in Figure 11. It will be appreciated that sheet 87 have been omitted from the drawings, other than Figure 16, for the purposes of clarity.

In other embodiments, sheet 87 is not used.

10 Other punching, bending and folding techniques are also applicable to the manufacture of conductor 2 from sheet 81.

The punching technique used in the embodiments described in the drawings results in about 17% of copper sheet 81 being converted to waste. That is, conductor 2 includes about 83% of the weight of copper originally included in sheet 81. For the  
15 prior art, the waste amounted to about 30% of the weight of the resultant conductor.

Once sheet 81 has been formed into conductor 2, it is wound into a multi-layer coil 90, as shown in Figure 13. The coil is subsequently transported to a building site or other installation site where it is progressively uncoiled as conductor 2 is feed into channel 12. Coil 90 is formed by securing an end of conductor 2 to a circular drum 91.  
20 Drum 91 has an outwardly facing circumferentially extending surface 92 that is abutted with face 63 of conductor 2. Drum 91 is rotated to wind conductor 2 about the drum and then over its own length to form coil 90. As the coil is created, the substantially planar face 63 is being engaged with the underlying drum of coil. Accordingly, the risk of inadvertent engagement between ribs in adjacent coils of the multi-layer coil 90 is  
25 minimised both during the coiling and uncoiling of conductor 2.

The shape and configuration of conductors 2, 3 and 4 provides for a small transverse width of those conductors, as there are only two transversely spaced apart copper components, these being body 61 and ribs 66. Moreover, the sheet 81 is only folded back upon itself once. Even in the Figure 14 embodiment, where sheet 81 is  
30 folded back upon itself twice, the additional fold is such that the two components of the sheet are either closely adjacent or abutted together.

Some prior art conductors include considerably more transversely spaced components, typically four, and are therefore require more material to make, are more difficult to make, and are transversely wider. It is also more usual for the prior art conductors to include many folds back upon its length. The conductors of the present  
5 embodiments, however, are minimally transversely wider than the respective pin that they are intended to engage. This allows conduit 1 to be: thinner; less intrusive in retrofit installations; and installed in smaller cavities or spaces that would have been achieved through use of the prior art referred to above.

Other advantages of the preferred embodiments are that they provide for:

- 10 1. A reduction in the cost of: the required raw materials; the manufacture; the handling and transportation; and the installation. As presently understood, the total cost of purchase and installation of the preferred embodiment of Figure 15 should be about half that of an equivalent prior art system.
- 15 2. A reduction in the amount of waste generated from the production of the conductor.
3. Increased safety through the provision of closures, and in particular closure 39.
4. The earth contact to be the first to contact, and the last to leave contact, with the respective conductor.
- 20 5. A reduced number of components, particularly for conduit 1. In the preferred embodiment, with the exception of conductors 2, 3 and 4, conduit 1 includes only three components, these being bracket 21, bracket 28 and closure 39. However, in embodiments where closure 39 is integrally formed with bracket 21, conduit 1 includes only two components.
- 25 6. A reduction in the installation time and the logistics in arranging for that installation due to the fewer required components. That is, separate components need to be separately sourced, cut to size and assembled. Accordingly, the far diminished number of components required by the present embodiments facilitates the installation of conduit 1.
- 30 7. Accommodates longitudinal progression of the conductors within the respective channels. This reduces point loading of the conductors and allows

for uniform bends to be formed by those conductors as they extend between conduits.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that it may be embodied in many other  
5 forms.

# **Exhibit K to Higgins & Ors v. Sinclair**

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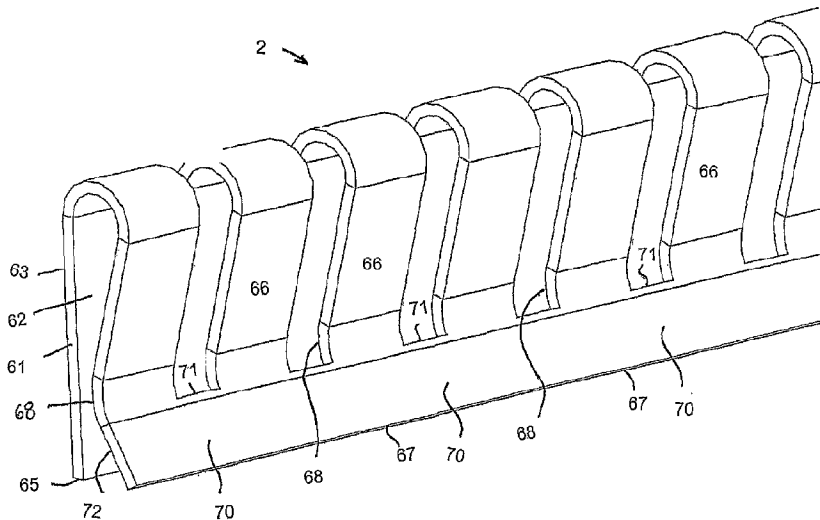
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[Continued on next page]

(54) Title: AN ELONGATE ELECTRICAL CONDUCTOR THAT IS ADAPTED FOR ELECTRICALLY CONNECTING WITH AN ELECTRICAL CONTACT



(57) Abstract: An elongate electrical conductor (2) is disclosed that is adapted for electrically connecting with an electrical contact, the conductor (2) includes a longitudinally extending elongate body (61) for defining a first contact surface (62); and a plurality of longitudinally spaced apart ribs (66) that extend from the body (61) to respective free ends (67) that are spaced apart from the first contact surface (62) for allowing the contact to be progressed between the body (61) and one or more of the ribs (66), each rib (66) including a respective second contact surface (68) that is opposed with the first surface (62) wherein, upon progression of the contact between the body (61) and the one or more ribs (66), the first surface (62) and the respective one or more second surfaces (68) are resiliently biased into engagement with the contact.

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**AN ELONGATE ELECTRICAL CONDUCTOR THAT IS ADAPTED FOR  
ELECTRICALLY CONNECTING WITH AN ELECTRICAL CONTACT****FIELD OF THE INVENTION**

5           The present invention relates to an elongate electrical conductor and in particular to an elongate electrical conductor that is adapted for electrically connecting with an electrical contact.

          The invention has been developed primarily for providing common power and communications lines in domestic, commercial and public buildings and will be  
10 described hereinafter with reference to those applications. It will be appreciated, however, that the invention is not limited to those fields of use and is also suitable for providing only power or only communication lines, whether that be in the above categories of buildings or otherwise.

**BACKGROUND OF THE INVENTION**

15           Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of common general knowledge in the field.

          Recent prior elongate electrical conductors are disclosed in US patents 6,309,229 and 6,395,987, both of which are in the name of the present inventor. While the  
20 conductors disclosed in these patents provide possible solutions to the problems that are identified in the specification, they are relatively complex and difficult to manufacture, as well as occupying considerable volume for the current carrying capacity that is accommodated.

          These types of conductors are typically formed from a copper sheet and, for a  
25 unit length and current carrying capacity, are heavy and therefore relatively expensive and difficult to transport. Moreover, the production of the conductors results in the generation of considerable waste material.

**SUMMARY OF THE INVENTION**

          It is an object of the present invention to overcome or ameliorate at least one of  
30 the disadvantages of the prior art, or to provide a useful alternative.

          According to a first aspect of the invention there is provided an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

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a longitudinally extending elongate body for defining a first contact surface; and  
a plurality of longitudinally spaced apart ribs that extend from the body to  
respective free ends that are spaced apart from the first contact surface for allowing the  
contact to be progressed between the body and one or more of the ribs, each rib  
5 including a respective second contact surface that is opposed with the first surface  
wherein, upon progression of the contact between the body and the one or more ribs, the  
first surface and the respective one or more second surfaces are resiliently biased into  
engagement with the contact.

In a preferred form, the spacing between the free ends and the first contact  
10 surface is greater than the spacing between the first and second contact surfaces.

Preferably, the ribs are resiliently mounted to the body. More preferably, the ribs  
are resilient.

Preferably also, the body is a conductive sheet having two opposite elongate  
longitudinally extending edges, wherein the ribs extend from one of the edges. In some  
15 embodiments, the body includes a further conductive strip that extends from the other of  
the edges. The further conductive strip is preferentially used in high current  
applications.

In a preferred form, adjacent free ends are mechanically connected to collectively  
increase the resilient bias. More preferably, the adjacent free ends are mechanically  
20 connected by respective intermediate integrally formed segments. Even more  
preferable, the segments collectively define with the free ends an engagement face for  
guiding the progression of the contact into biased engagement with the first and second  
surfaces. In the preferred embodiments, the engagement face is continuous.

Preferably, the engagement face is opposed with and inclined away from the first  
25 surface. More preferably, the engagement face extends between an inner edge and an  
outer edge that terminates opposite the other edge.

Preferably also, when the first and second surfaces are biased into engagement  
with the contact, the inner edge abuts the contact. More preferably, the ribs restrain  
longitudinal movement of the contact.

30 In a preferred form, the conductor is formed from a continuous conductive sheet  
that is folded upon itself along a longitudinal fold line. More preferably, the sheet is



punched to form the ribs. However, in other embodiments, the sheet is cut or otherwise formed.

Preferably, the first contact surface is substantially planar and the second contact surfaces are arcuate. In some embodiments the second contact surfaces include a  
5 compound arc.

According to a second aspect of the invention there is provided an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate first body for defining a substantially planar  
10 contact surface; and

a longitudinally extending elongate second body being mounted to the first body for defining an arcuate contact surface that is opposed with the planar surface wherein, upon progression of the contact between the first and second bodies, the planar and the arcuate surfaces are resiliently biased into engagement with the contact.

Preferably, the arcuate contact surface is segmented. More preferably, the  
15 second body includes a plurality of longitudinally spaced apart ribs that extend from the first body to respective free ends which collectively define the arcuate surface. Even more preferably, the free ends are mechanically connected. In the preferred embodiments the free ends are mechanically interconnected by respective intermediate  
20 integrally formed segments.

Preferably, the first body is substantially planar and includes two opposite faces, one of which defines the planar contact surface. More preferably, the second body is arcuate and includes opposite convex and a concave faces, the formed defining the arcuate contact surface.

According to a third aspect of the invention there is provided a conduit for an  
25 elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conduit including:

a longitudinally extending housing;  
one or more mounting formations disposed within the housing for captively  
30 retaining the conductor to the housing;

an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

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a closure that is mounted to the housing for moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening respectively.

5 Preferably, the closure is mounted to the housing for rotation between the open and closed configurations. More preferably, the closure is hinged to the housing. Even more preferably, the closure is resiliently biased toward the closed configuration.

In some embodiments the closure is resiliently biased toward the closed configuration. Preferably, the closure includes an internal biasing element for providing the resilient bias. In an embodiment, the biasing element is a leaf spring.

10 In some embodiments, the closure includes a longitudinal line of weakness about which it is resiliently deformed from the closed configuration.

Preferably also, the contact is part of a contact assembly and, as the assembly is progressed into the opening, the closure is moved toward to open configuration. More preferably, the contact assembly engages the closure to effect progression toward the  
15 open configuration.

In a preferred form, the mounting formation is a retaining channel that extends continuously through the housing. More preferably, the channel includes a continuous open end for receiving the contact. More preferably, the open end is downwardly facing. In the preferred embodiments, the open end defines the bottom of the channel.

20 Preferably, the housing includes a plurality of spaced apart channels for captively retaining respective conductors. More preferably, the channels are parallel. In the preferred embodiment, the channels longitudinally coextend and are transversely spaced apart.

Preferably also, the housing is extruded.

25 In a preferred form, the closure, in the closed configuration, extends across the opening. More preferably, the opening extends longitudinally and the conduit includes a plurality of closures that, in the closed configuration, collectively extend longitudinally across substantially all of the opening. Even more preferably, movement of one closure between the open and closed configuration occurs independently of movement of any  
30 other of the closures. In the preferred embodiment the closures are modular.

In some embodiments the closures are formed from an elongate strip and interposed with longitudinally running slots. In other embodiments the housing includes

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a channel on its rear face for use with adhesive tape for fixing the housing to a carrying surface. Preferably the housing includes an internal cavity for housing the head of a fixing means for fixing the housing to a carrying surface.

Preferably, the closure is mounted inside the housing and, in the closed configuration, extends upwardly from the housing and across the opening. More preferably, the closure is hinged at or adjacent to the housing wherein the movement between the open and closed configurations occurs within the housing. In the preferred embodiments, the opening includes two opposite edges and the closure extends from a mounting end that is hingedly engaged with the housing adjacent to one of the opposite edges, to a free end that, in the closed configuration, is disposed adjacent to the other of the opposite edges.

Preferably also, the mounting formation includes a locating formation for orientating the conductor for resilient deformation upon engagement with the contact. More preferably, the conductor includes a plurality of engagement faces for engaging with the contact, and the locating formation orientates the engagement faces for resiliently deforming into engagement with the contact. Even more preferably, the locating formation is a protrusion that extends from the mounting formation.

In other embodiments, the mounting formation includes a channel having an open end defined by the opening. More preferably, the opening is downwardly facing. Even more preferably, the closure is a flap that, in the closed configuration, extends across substantially all of the opening and which is resiliently deformed by the contact into the open configuration.

According to a fourth aspect of the invention there is provided a conduit for an elongate electrical conductor having two opposed engagement elements that are adapted for electrically connecting with an electrical contact, one of the elements being substantially planar and the other being arcuate, the conduit including:

- a longitudinally extending housing;
- one or more mounting formations disposed within the housing for captively retaining the conductor to the housing;
- an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

one or more locating formations associated with the mounting formations for orientating the conductor to ensure that the substantially planar engagement face is inclined with respect to the contact.

Preferably, the conduit includes a closure that is mounted to the housing for  
5 moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening.

Preferably also, the arcuate engagement face includes a compound arc.

In a preferred form, the mounting formations captively retain the conductor within the housing. For typical domestic AC voltages this is required to ensure for the  
10 safety of persons in the vicinity. However, for low voltage DC applications the design of the conduit is able to accommodate the conductor being partially or substantively disposed outside of the housing.

In some embodiments the conduit is arranged to carry three or more elongate electrical conductors. Preferably, the conductors are spaced apart from each other to  
15 provide a plurality of electrical circuits.

According to a fifth aspect of the invention there is provided a conduit for an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conduit including:

- a longitudinally extending housing;
- 20 an open ended channel disposed within the housing for captively retaining the conductor within the housing;
- an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and
- a closure that is disposed within the housing adjacent to the open ended channel  
25 for moving between a closed configuration and an open configuration for providing a barrier to unintended access to the conductor.

Preferably, the closure is moved into the open configuration when the contact is brought into engagement with the conductor. More preferably, only that portion of the closure adjacent to the contact is moved into the open configuration.

30 According to a sixth aspect of the invention there is provided a contact assembly for electrically connecting with a plurality of conductors contained within a conduit, the contact including:

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a housing that is movable into engagement with the conduit; and  
a plurality of contact formations mounted to the housing and which are movable  
into engagement with respective conductors in a predetermined sequence.

Preferably, the housing is movable into releasable engagement with the conduit  
5 and the contact formations are movable into releasable engagement with the respective  
conductors.

Preferably also, the contact formations include at least two pins, wherein one of  
the pins protrudes further from the housing than the other. More preferably, the contact  
formations include three parallel pins that extend transversely from the housing and  
10 terminate at free ends that are transversely spaced apart.

In a preferred form, the contact includes at least two parallel pins and the relative  
transverse offset between the pins and the respective conductors is such as to provide the  
predetermined sequence.

Preferably, the contact assembly includes an active pin and a neutral pin, and the  
15 predetermined sequence comprises the neutral pin and then the active pin engaging the  
respective conductors. More preferably, the contact assembly includes an active pin, a  
neutral pin and an earth pin, and the predetermined sequence comprises the earth pin and  
then the neutral pin and the active pin engaging the respective conductors. Even more  
preferably, the neutral pin and the active pin substantially simultaneously engage with  
20 respective conductors. In other embodiments, however, the predetermined sequence  
comprises the earth pin and then the neutral pin and then the active pin engaging the  
respective conductors.

Preferably also, the pins are movable out of engagement with the respective  
conductors, that movement occurring in the reverse of the predetermined sequence.

25 In some embodiments the pins are biased to move out of engagement with the  
respective conductors. In other embodiments the pins are connected to a cam arranged  
to bias the pins into engagement with the respective conductors. In other embodiments  
the pins are provided with connectors for connecting to respective cables for conducting  
power or signals to or from the conductors. Preferably the pins are integrally formed  
30 with the housing and respective cables for conducting power or signals to or from the  
conductors. In some embodiments the pins are connected to respective socket  
formations for conducting power or signals to or from the conductors. In other

embodiments the pins are provided in the reverse order to enable the contact assembly to be brought into engagement with the conductors from an alternative direction. In further embodiments the pins are arranged for engagement with a sub-set of the conductors in the conduit. In a preferred embodiment the housing includes a guide to indicate to a user  
5 that the contact assembly is in engagement with the respective conductors. Preferably, the guide provides a visual indication to the user. More preferably, the housing includes a visually distinct portion, and the guide includes a window through which the user is able to view the portion when the contact assembly is in engagement with the respective conductors.

10 According to a seventh aspect of the invention there is provided an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate conductive sheet having a first face and a second face opposite to the first face, wherein the first face defines a first contact  
15 surface; and

a plurality of longitudinally spaced apart ribs that extend transversely from the sheet and back along at least a portion of the first contact surface but not along the second face, each rib including a respective second contact surface wherein, upon progression of the contact between the sheet and the one or more ribs, the first surface  
20 and the respective one or more second surfaces are resiliently biased into engagement with the contact.

Preferably, the faces are joined along a first common longitudinal edge and a second common longitudinal edge and the ribs extend from the first edge and terminate in respective free ends. More preferably, the second contact surfaces are disposed  
25 intermediate the first edge and the respective free ends. Even more preferably, the free ends terminate between the first and second edges. In some embodiments the free ends extend beyond the second edge. However, the free ends do not extend around the second edge.

According to an eighth aspect of the invention there is provided a contact  
30 assembly for electrically connecting with a plurality of conductors contained within a conduit, the contact including:

a housing that is movable into engagement with the conduit;

a plurality of contact formations mounted to the housing and which are movable into engagement with respective conductors; and

a guide that is mounted to the housing and which provides an external indication that the contact formations are in engagement with the respective conductors.

5 In an embodiment, the housing includes a visually distinct portion, and the guide includes a window that overlies and through which the portion is viewable when the contact formations are in engagement with the respective conductors. Preferably, the portion is otherwise substantially obscured from view.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

10 Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a conduit according to the invention in combination with a contact assembly, also according to the invention, that is mounted to the conduit in a movable configuration;

15 Figure 2 is a perspective view of the contact assembly of Figure 1;

Figure 3 is an enlarged view of the conduit and contact assembly of Figure 1, with the contact in an operative configuration;

Figure 4 is an enlarged side view of the conduit of Figure 1;

Figure 5 is a side view of the conduit and contact assembly of Figure 3;

20 Figure 6 is an enlarged side view of the conduit and the contact assembly as they are moved relative to each other and from the movable configuration toward the operative configuration;

Figure 7 is a side view similar to Figure 6 with the conduit and contact assembly in the operative position;

25 Figure 8 is a cut-away rear perspective view of the conduit and contact assembly intermediate the operative and movable configurations;

Figure 9 is an enlarged side view of the conduit of Figure 1 illustrating a movable closure in a closed configuration;

30 Figure 10 is a view similar to that of Figure 9 showing the closure in the open configuration;

Figure 11 is a side view of a conductor according to the invention;

Figure 12 is a perspective view of the conductor of Figure 11;

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Figure 13 is a cross sectional view of a roll of conductors of Figure 11;

Figure 14 is a side view, similar to Figure 11, of a high current rated conductor according to the invention;

Figure 15 is a perspective view of the conductor of Figure 11 extending between  
5 two conduits of Figure 1;

Figure 16 is a perspective view of the conductor at an intermediate stage of its manufacture; and

Figure 17 is a side view of the contact assembly of Figure 1 showing the contact formations.

10 Figure 18 is an enlarged side view of the conduit of Figure 1;

Figure 19 is an enlarged cross-sectional view of the movable closure;

Figure 20 is a perspective view of the closure of Figure 19;

Figure 21 is a perspective view of the closure of Figure 19 located in the conduit and showing the closure in the open and closed position;

15 Figure 22 is a perspective exploded view of the elements of a contact assembly;

Figure 23 is a perspective view of a conduit in combination with a contact assembly that is mounted to the conduit in a movable configuration;

Figure 24 is a perspective rear view of a contact assembly in the operable configuration;

20 Figure 25 is a perspective rear view of a contact assembly in the movable configuration;

Figure 26 is a perspective view of an alternative contact assembly;

Figure 27 is a perspective view of another alternative contact assembly;

25 Figure 28 is a perspective view of the contact assembly of figure 27 engaged with the conduit;

Figure 29 is a perspective view of a further alternative contact assembly engaged with the conduit;

Figure 30 is a cross sectional side view of an alternative conduit arrangement;

30 Figure 31 is a perspective view of the conduit of figure 15 with a corner conduit and an end cap installed;

Figure 32 is an exploded perspective view of the corner conduit of figure 31;

Figure 33 is an exploded perspective view of the end cap of figure 31.



**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring to Figures 1 to 10 and Figures 15 and 17, and particularly to Figures 1, 4 and 17, there is illustrated an elongate insulating conduit 1 for three generally parallel elongate electrical conductors 2, 3 and 4 that are adapted for electrically connecting a contact assembly 5 having corresponding electrical contacts in the form of pins 7, 8 and 9. Conduit 1 includes a longitudinally extending extruded plastic housing 11 of substantially consistent cross-sectional shape. Three open-ended channels 12, 13 and 14 are disposed within housing 11 for captively retaining respective conductors 2, 3 and 4 within the housing. An elongate longitudinally extending opening 15 in housing 11 receives assembly 5 and thereby allows pins 7, 8 and 9 to be brought into engagement with respective conductors 2, 3 and 4. As best shown in Figure 4, two resiliently deformable plastics closures 17 and 18 are disposed within housing 11 adjacent to open ended channels 13 and 14 for moving between a closed configuration, as shown, and an open configuration for providing a barrier to unintended access to conductors 3 and 4.

Housing 11, in this embodiment, is a three-piece construction and includes a rigid plastics mounting bracket 21 that is attached to a wall or other support element that the housing is to extend along or between. The attachment, in this embodiment, is by a plurality of longitudinally spaced metal screws 22 that extend through apertures (not shown) in bracket 21. In other embodiments, the attachment is affected by other devices, for example, bolts, adhesive, rivets and the like.

Bracket 21 includes a rear plate 23, a base 24 that extends forwardly from the bottom of plate 23, and a front plate 25 that is extends substantially normally from base 24. Plate 23 includes a snap-lock fitting 26, while plate 23 and base 24 collectively define a retention channel 27.

Plate 23, base 24, plate 25, fitting 26 and channel 27 are integrally formed.

Housing 11 also includes an extruded plastic front bracket 28 having a front plate 29 that is spaced apart from and extends in the same plane as plate 25 for defining opening 15. A rigid wall assembly 30 extends rearwardly from plate 29 and, together with that plate, define channels 12, 13 and 14. Assembly 30 also includes a snap-lock fitting 31 and a locking post 32 that respectively complementarily interact with fitting 26 and channel 27.

Plate 29, assembly 30, fitting 31 and post 32 are integrally formed.

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Channels 12, 13 and 14 include respective retention protrusions in the form of pairs of opposed longitudinally extending ridges 35 and 36 that extend toward each other to define the open end of the respective channels. These ridges retain conductors 2, 3 and 4 in the respective channels, and include lower bevelled edges to guide pins 7, 8 and 9 into the channels.

The channels also include mounting formations, in the form of respective abutments 37 and recesses 55, that shape the interior of the channels for ensuring the respective conductors are inclined with respect to the pins. This functionality will be described in more detail below.

Base 24 includes a mounting formation in the form of a longitudinal channel 38 that coextends with housing 11 and which includes pairs of spaced apart internal abutments. An extruded plastic closure 39 extends within housing 11 for movement between an open configuration, as shown in Figure 4, and a closed configuration, as shown in Figure 9. Closure 39 has a longitudinal length of about 50 mm and includes a support formation, in the form of a ribbed spigot 40, that is complementarily fixedly mounted within channel 38 in an interference fit.

Closure 39 also includes a shutter 41 that is hinged to spigot 40 for movement between the open configuration, where the shutter is substantially horizontal, and the closed configuration, where the shutter is substantially vertical. The free end of shutter 41 includes an integrally formed peak 42 that extends normally away from the shutter to provide additional resistance to ingress of unwanted items into housing 11.

Figure 18 shows an alternative embodiment of the housing 11, in which the snap lock fitting 26 is extended outwardly so as to define a larger space or cavity 19 between the mounting bracket 21 and the rearward face of the front plate 29. The function of the cavity 19 is to provide space to accommodate the various types or size of fixing bolt 22 that can be used to mount the conduit 1. A longitudinally extending channel or groove 6 is also formed in the rearward surface of the mounting bracket 21 above the rear plate 23. The groove 6 is arranged to accept double sided adhesive tape or other adhesive strip for mounting the conduit 1 to a surface. The mounting methods using the groove 6 or the bolt 22 are used in combination in some embodiments and separately in other embodiments.

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A longitudinal channel 16 is formed in the lower wall of the base 24 of the mounting bracket 21, which is arranged to be engaged with a corresponding ridge (not shown) on the surface on which the conduit 1 is mounted. The engagement of the ridge in the channel 16 provides an extra fixing point for the mounting bracket 21 when used in combination with a bolt 22 and/or adhesive tape and the groove 6. In a further alternative, the lower wall of the base 24 is formed flush, that is, the channel 16 is omitted. This provides a further fixing point extending downwardly along axis 33. The fixing element in this embodiment is a bolt but in other embodiments the bolt is replaced with a fixing element such as a bolt, screw, nail, staple or rivet placed through a hole made in the base 24 or with adhesive, adhesive tape or the like.

The longitudinal length of housing 11 varies depending upon the site in which it is installed. Typically, that longitudinal length is in the range of about 150 mm to many tens of metres. In other embodiments, however, smaller or greater lengths are used where the installation requires. Accordingly, as closure 39 is about 50 mm in length, the preferred embodiments make use of a plurality of like closures that, in the closed configuration, collectively and substantially extend across all of opening 15. In those embodiments where the longitudinal length of housing 11 is not an integral multiple of the length of closure 39, one or more of the closures are trimmed to size.

Shutter 41 is resiliently biased into the closed configuration, and progressed into the open configuration as assembly 5 is progressed into aperture 15. As assembly 5 will at any one time engage, at most, two adjacent shutters, the other shutters will remain in the closed configuration and thereby continue to obstruct the ingress of dirt, dust, and other items into housing 11.

Figure 19 shows closure 39 in cross section to illustrate a biasing element, in the form of an internal stainless steel leaf spring 43. The spring is, in this embodiment, disposed entirely within the walls of closure 39 and arranged to bias shutter 41 into the closed position, as shown. The spring comprises an upper part 44 disposed within the main body of the shutter 44, an arcuate centre portion 51 disposed in the main flexing region of the body of closure 39 towards the spigot 40, and a base portion 52 disposed within the spigot end of the closure 39. Spigot 40 has a longitudinally extending flange 53 for engagement with the spaced channel 38 in plate 25.

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Figure 20 is a perspective view of closure 39 best illustrating a plurality of uniformly spaced apart parallel slots 54 that vertical extending through closure 39 from the integrally formed peak 42, through shutter 41 and into the flexing region of closure 39. Slots 54 divide closure 39 into separately movable elements which respond  
5 generally independently of each other to the insertion of one or more assemblies 5 into opening 15. This increases the chance of closure 39 remaining in the closed position immediately to the sides of an inserted assembly 5 so as avoid leaving the interior of conduit 1 exposed. The operation of the closure is illustrated in Figure 21, from which the inserted contact assembly has been omitted for clarity.

10 The spring 43 is a continuous strip formed longitudinally within the closure 39 with the slots 54 extending through it. In other embodiments, the spring 43 is formed by separate elements with one or more disposed between each slot 54. The spring is made from stainless steel. In other embodiments the spring is made from steel, other metals or plastics. In some embodiments the slots 54 are spaced at intervals of up to 15mm along  
15 the strip, in other embodiments the slots are spaced at intervals of up to 20mm. In further embodiments the slots are spaced at intervals of up to 50mm and in still further embodiments the slots are spaced at intervals of over 50mm. The choice of spacing depends on the width of the contact assemblies used so as to give the best fit of the closure in the opening either side of the assembly.

20 In some embodiments closure 39 is omitted. In other embodiments, closure 39 is integrally formed with base 24.

It should be noted that the closure has also been omitted from some of the drawings, although this is primarily for the purposes of clarity in illustrating other features of the preferred embodiments.

25 Housing 11 is formed in a continuous length, and cut to size for the installation being undertaken. Additionally, conductors 2, 3 and 4 are also continuous. If necessary, discontinuous housings and conductors are used, although this is generally less preferred.

The continuous nature of housing 11 and conductors 2, 3 and 4 allow assembly 5  
30 to be received within opening 15, and pins 7, 8 and 9 engaged with respective conductors 2, 3 and 4 at any longitudinal position along housing 11. As will be described below, assembly 5 is therefore able to be positioned, as required. While in

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some embodiments assembly 5, once positioned, is fixed, in most embodiments assembly 5 is releasably engaged with the conductors and movable, as desired. This provides considerable flexibility in design and placement of assembly 5 and, hence, considerable flexibility in placement of electrical apparatus that connect with assembly 5 to draw power from one or more of the conductors or to transmit and/or receive data via one or more of the conductors.

Assembly 5 includes a generally cylindrical insulating plastic body 45 that coaxially and rotatably supports a circular front face 46. This face has a plurality of apertures arranged in a predetermined orientation corresponding to the standard socket configuration for the jurisdiction concerned. In the illustrated embodiment face 46 includes three apertures in the UK format. Contained within body 45 and behind the apertures are sprung electrical contacts (not shown) for engaging with respective pins of a complementary electrical plug when those pins are received within the apertures. These contacts, in turn, are electrically connected to respective pins 7, 8 and 9. In this embodiment pin 7 is the earth pin, pin 8 is the active pin, and pin 9 is the neutral pin of a single-phase 240 Volt supply system.

Body 45 supports an intermediate annular adjustment band 47 that is mechanically connected to face 46 for allowing manual relative rotation between body 45 and face 46 between a movable configuration, as shown in Figure 1, to an operative configuration, as shown in Figure 3. The rotation is about a common axis 48.

Pins 7, 8 and 9 are directly mechanically connected with band 47 via an axle 49 that is coaxial with axis 48. These pins extend radially from the axle and therefore also rotate through a 90° arc as the band is rotated by 90° relative to body 45. In the movable configuration, pins 7, 8 and 9, while located within housing 11, are parallel with and spaced apart from the conductors and, as such, assembly 5 is longitudinally movable along opening 15. In the operable configuration, however, the pins are normal to and engaged with the respective conductors and, as such, assembly 5 is restrained against longitudinally progression along opening 5. To further illustrate, reference is made to Figure 5, where assembly 5 is in the operable configuration. As shown, pins 7, 8 and 9 extend vertically from axle 49 and are engaged at their free ends with respective conductors.

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In other embodiments the pins rotate through other than 90° to progress between the movable and operable configurations. Moreover, in some embodiments, there is a mechanical link including gearing operable between band 47 and axle 49. Typically, the gearing is a reduction gearing to provide mechanical advantage to any manual input.

5 While this necessitates, in some embodiments, the rotation of band 47 through more than 90°, it also allows a greater clamping force between pins 7, 8 and 9 and respective conductors 2, 3 and 4 while containing the manual power required to be exerted. In general terms, the greater the clamping force between the pins and the respective  
10 of the contact. This is particularly important for communication signals, as there contain high frequency components that are more susceptible to degradation due to poor contacts.

In some embodiments the mechanical link between the band 47 and the axle 49 is a spring arranged to bias the pins 7, 8, 9 into the moveable configuration relative to the  
15 rest of the assembly 5. Figure 22 is a perspective view of the contact assembly exploded along the axis 48. The band 47 includes a plate 57 which, when the assembly 5 is assembled is engaged with the band 47 by way of a radially displaced snap locking ridges. The plate 57 is in turn lockingly engaged with an insertion member or pin keeper  
20 pins 7, 8, 9 retract when the assembly 5 is in the moveable position. The keeper 56 serves to protect the pins 7, 8, 9 when they are in this position.

A plate 73 is rotatably disposed within the radial snap lock ridge of the plate 57 and between the plate 57 and the rearward surface of the band 47. In the assembled  
25 assembly 5 the plate 73 is engaged for rotation with the axle 49 relative to the keeper 56, plate 57 and band 47. A spiral spring 59 is disposed between the plate 73 and the plate 57 and engaged at one end with a hole 58 in the plate 57 and at the other end with a circumferentially disposed slot 60 in the plate 73. The spring 59 provides biasing between the two plates 57, 73 about the axis 48 and thus biases the pins 7, 8, 9 attached  
30 to the axle 49 into the moveable configuration.

Band 47 includes a lever 50 that extends radially outwardly from the band. This lever provides mechanical assistance to a user when manually progressing the band between the operable and movable configurations. In other embodiments, band 47

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includes a predetermined arrangement of engagement formations (not shown) for inter-engaging with a complementarily shaped tool.

In the embodiment shown in figure 23 the plate 57 has a radially extending portion 74 that lies over the opening 15 when the assembly 5 is located in the conduit 1 in the engaged position. The portion 74 has an opening 10 extending through the plate towards the forward face 20 of the keeper 56. The forward face 20 is coloured to give a visual indication by its alignment through the hole 58 that the assembly 5 is in the engaged or on position. In other words the face 20 and the hole 58 provide means to indicate that the assembly is in the engaged position. Rotation of the band 47 in the direction to bring the assembly 5 into the moveable or off position moves the hole 58 out of alignment with the face 20 thereby removing the visual indication. This provides the converse indication that the assembly 5 is in the moveable or off position. The face 20 is coloured with paint so as to be more clearly visible though the hole 58. In other embodiments the face 20 is coloured with a sticker or decal or by moulding the keeper 56 from a coloured material. The colour applied or moulded is visually distinctive, luminous and/or fluorescent colour and/or a reflective element.

In use, bracket 21 is cut to the required longitudinal length and attached via screws 22 to an adjacent support surface, typically a wall, floor or ceiling. Bracket 28 is cut to the same length and continuous conductors 2, 3 and 4 are inserted into channels 12, 13 and 14. Post 32 is then placed in channel 27, and bracket 28 rotated so as to bring fittings 26 and 31 into snap-locked engagement and thereby fixedly retain brackets 21 and 28 together.

Assembly 5, with band 47 rotated into the movable configuration, is presented to conduit 1 in the approximate desired longitudinal location on that conduit. Pins 7, 8 and 9 and axle 49 are then progressed through opening 15. As this occurs, axle 49 engages the adjacent shutter 42 and progresses it from the closed configuration to the open configuration. Only the shutter engaged by axle 49 will be progressed to the open configuration, the remaining shutters will remain in the closed configuration.

Assembly 5 is then longitudinally progressed along opening 15 until the final positioning with respect to conduit 1 is determined. If the assembly is progressed longitudinally beyond the initially engaged shutter to a subsequently engaged shutter, the initially engaged shutter automatically returns to the closed configuration, while the

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subsequently engaged shutter progresses to the open configuration. In this embodiment, the shutters are resiliently biased toward the closed configuration.

With the location of assembly 5 determined, the user manually rotates band 47 to progress the pins from the movable configuration into the operable configuration of  
5 Figures 5 and 7. It will be appreciated that closures 17 and 18 are resiliently deformed where they are adjacent to respective pins 8 and 9. Otherwise, those closures remain as a barrier to ingress into channels 12, 13 and 14 of contaminants or unintended items.

The surface of the axle 49 forms an axially disposed cam 77 as in figures 6 and 7. The cam 77 is radially spaced to progressively bear against the shutter 41 as the  
10 assembly 5 is moved towards the engaged position as in figure 7. The cam 77 urges the shutter 41 against the base 24 of the plate 23 and the pins 7, 8, 9 into further engagement with the conductors 2, 3, 4 serving to further secure the assembly 5 into engagement with the conduit 1. In figure 24 the assembly 5 is in the engaged position but free from the  
15 conduit 1 to best illustrate the structure of the cam 77. In figure 25 the assembly 5 is in the movable position but free from the conduit 1 and best illustrates the cam 77 retracted within the keeper 56.

The upper surface of the keeper 56 carries two sprung snap fit ridges 78 arranged to engage with the inner edge of the upper lip of the opening 15 when the assembly 5 is inserted though the opening 15 as in figures 6, 7. The structure of the snap fit ridges is  
20 further illustrated in figures 24 and 25. The ridges 78 provide a positive indication to the user that the assembly 5 is properly located in the opening 15. The ridges 78 also serve to hold the assembly 5 in the opening 15 when the assembly is in the disengaged or moveable position and facilitate the sliding movement of the assembly to an alternative position along the opening 15. The ridges 78 provide a snap on function and a snap off  
25 function for the assembly 5.

Figures 8 and 17 illustrate the pins intermediate the movable and the operative configurations. With particular reference to Figure 17, it will be understood that as the pins rotate they engage with the respective conductors in a predetermined sequence. In this embodiment, as the pins move from the movable configuration to the operable  
30 configuration that sequence includes the first contact being made between pin 7 and conductor 2, and subsequent simultaneous contact being made between pin 8 and conductor 3 and pin 9 and conductor 4 respectively. In other embodiments, pin 9 and



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conductor 4 are configured to make contact prior to the contact between pin 8 and conductor 3.

It will also be appreciated that, in this embodiment, pin 7 is an earth pin and is always the first pin to contact the respective conductor, and the last pin to be in contact  
5 with the respective conductor.

The sequential engagement of the pins with the respective conductors also reduces the maximum manual forces required to rotate band 47.

During movement of the pins from the operable configuration, the breaking of the contacts between the pins and the conductors is the reverse of the predetermined  
10 sequence.

It will be appreciated, from the teaching herein, that the predetermined sequence for a given embodiment having co-radial pins of equal thickness is determined by the relative lengths of the pins and the relative offset between the conductors in the direction that the length of the pins is measured. In other embodiments the same effect is  
15 achieved by radially offsetting the pins on axis 49, or by having pins of a different radial width.

In practice, conduit 1 supports a plurality of spaced apart like assemblies 5 (not shown) which provide significant design flexibility. Moreover, if, with time, it is desired to longitudinally re-position one or more of assemblies 5, band 47 is progressed  
20 to the movable position. Thereafter, assembly 5 is either longitudinally translated along opening 15, or removed from opening 15 altogether and reinserted at the desired location. In any event, once the positioning at the desire location is affected, band 47 is once again returned to the operative configuration and assembly 5 is once again operatively connected with the conductors.

Figure 26 is a perspective view of an alternative embodiment of a contact  
25 assembly 5. In this embodiment, the socket arranged to accept a plug present in other embodiments is replaced with a cable 79 attached directly to the contacts 7, 8, 9. The connections between the contacts 7, 8, 9 and the cable 79 are sealed inside a moulded plastics body 80 which is rotatably engaged with the keeper 56. The body provides the  
30 same functionality as the band 47 of other embodiments, that is, to enable the assembly 5 to be moved between the engaged and moveable positions. The cable 79 is connected at its end distant from the contact assembly 5 (not shown) to a plug. In other

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embodiments the cable is connected to a socket. In some embodiments the cable is supplied with a pre-moulded plug or socket.

Figure 27 is a perspective view of a further embodiment of a contact assembly 5 in which the body 80 is provided with three connectors 88 to which wires can be attached and secured using corresponding grub screws 89. The connectors 88 are in electrical communication with the contacts 7, 8, 9. The assembly 5 is provided with a hexagonal socket 93 defined by an inner wall 94 of the axle 49. The socket 93 is designed to engage with a correspondingly shaped tool (not shown) to provide alternative means for axially rotating the contacts 7, 8, 9 between the engaged and movable positions.

Figure 28 is a cross sectional perspective view of a contact assembly 5 of the type illustrated in figure 27 in engagement with a conduit 1. In this embodiment, a hole 95 is formed in the rear plate 23 and the locking post 32 to provide entry for the keeper 56 of the assembly 5 into the conduit 1 from the rear. Once entered through the hole 95 the assembly 5 is brought into the engaged position either by rotating the body 80 from behind the conduit 1 or by engaging the tool in the socket 93 from the front of the conduit. Since the contact assembly is entered in the opposite direction from those described in other embodiments, the sequence of the pins 7, 8, 9 of the contact assembly 5 used in this embodiment is in reverse. This embodiment is particularly suitable for the supply of power or signals to the conductors 2, 3, 4. Where power is being supplied, the contacts 7, 8, 9 provided are more substantial so as to be capable of safely carrying the supply current. The rear entry of the assembly 5 enables the power supply to be concealed behind the conduit 1 while remaining moveable between the engaged and disengaged positions from the front of the conduit 1.

Figure 29 is a perspective view of an alternative assembly 5 in engagement with the end of the conduit 1. The assembly 5 comprises a moulded body carrying pins 7, 8, 9 protruding at one end in a spaced arrangement corresponding to that of the elongate conductors 2, 3, 4. The pins 7, 8, 9 are arranged for entry into the open ends of conductors 2, 3, 4 in a plane parallel to the rear plate 23 of the conduit 1. The body 80 provides connectors 88 and screws 89 for attaching appropriate wires to the ends of the pins 7, 8, 9 distant from the entry into the conductors. The pins 7, 8, 9 of the assembly 5 are brought into and out of engagement with the conductors 2, 3, 4 by pushing or pulling

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the assembly respectively along the plane of the conductors parallel to the rear plate 23 of the conduit. The assembly 5 of this embodiment is suitable for connecting supply power or signals to the conductors 2, 3, 4. The pins 7, 8, 9 and corresponding connectors 88 are each stamped from one piece of copper alloy sheet. This provides for simple construction and good signal conduction properties as noted above.

Figure 30 is a cross sectional view of an alternative embodiment in which the conduit 1 carries a fourth elongate electrical conductor in addition to the three conductors 3, 4, 5 described in other embodiments. The additional conductor 96 is disposed in an open ended channel 97 formed behind the other channels 12, 13, 14, towards the rear of the plate 29. The channel 97 runs parallel to the other three channels and is spaced at the same distance from the base 24 as the upper most of the other channels 13.

The four conductor conduit 1 described above is suitable for carrying two electrical circuits in one installation. In one embodiment the two circuits are of different power ratings in another embodiment one circuit is regulated and the other unregulated. Alternatively, the conduit supplies two different communications circuits or, instead, one power and one communications circuit. In other embodiments the two circuits are used to provide a dual voltage power system. In further embodiments the circuits provide one power circuit and an extra control conductor.

In the dual voltage (two phase) supply embodiment, the conductor 2 nearest the front plate 29 provides the earth connection, the next nearest conductor 3 provides the live connection for the first phase, the next conductor 4 provides the neutral connection and the rearmost conductor 96 provides the live connection for the second phase.

Assemblies for use with the four track conduit 1 are adapted so that the appropriate pins engage with the corresponding conductors. In the two phase power supply embodiment described above, a first type of contact assembly with a standard socket layout is arranged to engage with the conductors 2, 3, 4 supplying the first phase voltage. A second type of assembly with a modified socket layout is arranged to engage with conductors 2, 4, 96 supplying the second phase voltage. The pins of the two types of assembly are arranged so that neither can be engaged with the incorrect voltage. Where the assemblies include a plug socket, there are different socket arrangements for the different voltages.

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The open ended channels 13, 14, 96 illustrated in Figure 30 include the longitudinally extending ridges 35, 36 to hold the conductors 3, 4, 96 in the channels. The channels also include a second set of longitudinally extending ridges 111, 112 which restrain the upward freedom of the conductors in the channels and define  
5 airspaces 113 above each of the conductors. These air spaces 113 provide ventilation to dissipate heat generated by the conductors. In the embodiment shown in figure 30, the earth conductor 2 is not ventilated in this manner as it generates little heat in normal operation. Airspaces 113 are also illustrated in the three conductor arrangements of figures 18 and 21. In some embodiments, all conductors are provided with such  
10 airspaces.

That is, as the power and communication requirement of a building, or room within that building, change, conduit 1 allows the location of the power and communication outlets to be quickly and easily modified to accommodate any change in the required functionality.

Reference is now made to Figures 11 and 12, which specifically illustrate conductor 2. It will be appreciated that conductors 3 and 4 are of the same construction and offer the same functionality as conductor 2 and, as such, will not be described separately. As discussed above, conductor 2 is longitudinally elongate and is adapted for electrically connecting with an electrical contact in the form of pin 7. Conductor 2  
20 includes a longitudinally extending elongate metal conductive body in the form of a copper sheet 61 for defining a first substantially planar contact surface 62 and an opposite face 63 that meet at common parallel longitudinal edges 64 and 65. A plurality of longitudinally spaced apart resiliently deformable ribs 66 extend from sheet 61 to respective free ends 67 that are spaced apart from the surface 62 for allowing pin 7 to be  
25 progressed between sheet 61 and one or more of ribs 66. Each rib includes a respective arcuate contact surface 68 that is opposed with surface 62 wherein, upon progression of pin 7 between sheet 61 and the one or more ribs 66, surface 62 and the respective one or more surfaces 68 are resiliently biased into engagement with the pin.

In the configuration shown in Figure 11, the spacing between ends 67 and  
30 surface 61 is greater than the spacing between surfaces 62 and 68.

All of ribs 63 extend from edge 64 to allow edge 65 and ends 67 to collectively define an opening 69 for receiving pin 7.

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Ribs 66 extend transversely away from edge 64 and back along substantially all of surface 62. The ribs do not extend at all along face 63 and, hence, minimise the required transverse thickness of conductor 2.

Adjacent ends 67 are mechanically and electrically connected to collectively  
5 increase the resilient bias between surfaces 62 and 68 when engaged with pin 7. In this embodiment, adjacent ends 67 are mechanically connected by respective intermediate integrally formed segments 70. These segments have respective top edges 71, and bottom edges that extend between and which lie flush with ends 67. Segments 70 collectively define with ends 67 an engagement face 72 for guiding the progression of  
10 pin 7 into biased engagement with surfaces 62 and 68. In this embodiment, face 72 is substantially planar, continuous and opposed with and inclined with respect to surface 62. In other embodiments, face 72 is arcuate.

Segments 70 allow conductor 2 to have a higher clamping force upon pin 7 as the clamping bias is provided not only by those ribs that are in direct contact with the pin,  
15 but also the adjacent ribs. Moreover, with pin 7 in the operative position, it will be in direct contact with surface 68 of one or two of the ribs. The immediately adjacent ribs, however, will bias the edges 71 into abutment with the longitudinal edges of pin 7, and thereby further retain that pin in the operative position. That is, conductor 2 offers both clamping and a mechanical locking of pin 7 in the operative position. This effect is best  
20 shown in Figure 7.

It will be appreciated that in other embodiments surfaces 68 include a compound arc.

Sheet 61 is the primary current carrying component of conductor 2. While some current inevitably flows along a path defined by ends 67 and segments 70, this is  
25 typically less than that flowing through sheet 61. The primary function of ribs 66 and intermediate segments 70 is to provide clamping and locking engagement with pin 7 and to otherwise ensure it is secured in good electrical contact with sheet 61.

Sheet 61 extends substantially along a plane and surface 62 is substantially planar to provide a large contact area between surface 62 and the adjacent opposed  
30 planar surface of pin 7. It will be appreciated that this area is far greater than the contact area between surface 68 and the adjacent surface of pin 7. This asymmetry also allows the transverse width of conductor 2 to be minimised. Moreover, less regard need be had

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to the current capacity of ribs 66 – in that the dimensions of the ribs is not critical – as less reliance is placed upon this current path. Rather, the highly conductive, continuous and regularly shaped sheet 61 offers a high quality low resistance current path, while ribs 66 are intended more for optimising the electrical engagement of the pin with surface 62.

Conductors 2, 3 and 4 are continuous to provide as low a resistance path as possible. This is also important for higher frequency signals, as discontinuities such as joints can provide sites for signal reflections and thereby compromise the data being communicated. Typically, the conductors are longer than conduit 1, and extend between adjacent like conduits. For example, reference is made to Figure 15 where two conduits 1 are mounted to respective support surfaces (not shown) and extend normally away from each other. Conductors 2, 3 and 4 extend continuously through and between both conduits 1. Moreover, the conductors accommodate bending or folding about a vertical axis (or axes). While the uniform bend in each conductor shown in Figure 15 extends through a total of 90°, in other embodiments alternative bends are accommodated.

It will also be appreciated that conductors 2, 3 and 4 are able to longitudinally slide in respective channels 12, 13 and 14. This is particularly important where bends such as that shown in Figure 15 are concerned, as the radius of the bends required is different for each conductor. This longitudinal sliding within the channels allows each conductor to progress to the least stressed position, and thereby best ensure that the bend is uniform. This absence of kinking and distortion of the conductors minimises any risk of degrading the conductor's mechanical performance – due to, for example, point loading – and electrical performance – due to, for example, creating a reflection site for high frequency signals.

Although Figure 15 illustrates the exposed conductors as they extend between adjacent conduits 1, in practice an intermediate corner conduit or bend conduit is used to provide continuous encasement of conductors 2, 3 and 4.

Figure 31 is a perspective view illustrating an intermediate corner conduit 98 and a conduit end cap 99. The conduit 98 comprises a rear housing 100 and a front plate 101 secured to the housing 100 using pins 102. The cap 99 comprises a rear housing 103 and a front plate 104.

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Figure 32 is a perspective exploded view of the conduit 98. The housing 100 comprises two open fronted substantially identical halves arranged at right angles to each other and with external cross-sectional dimensions that correspond to those of the conduit 1. The plate 101 comprises two halves arranged at right angles that are the same height as the conduit 1 and arranged to cover the forward open face of the housing 100 and to overlap the joint with the plate 29 of the conduit 1. The upper and lower edges of the housing 100 and the plate 101 carry snap lock fittings 105 to engage the housing 100 and plate 101. The upper face of the housing 100 and the plate 101 each define two sockets 106 which collocate when the plate 101 is installed on the housing 100 so that the pins 102 can be inserted in the sockets 106 to further secure the plate 101 to the housing 100.

The housing 100 and the plate 101 each bear two tabs 107. The tabs 107 on the housing 100 are arranged to engage in the end of the conduit 1 while the tabs 107 on the plate 101 are arranged to engage in the opening 15. The engagement of the tabs 107 of the conduit 100 with the conduit 1 hold the two securely together. The housing 100 includes two longitudinally extending ribs 108 that protrude forward from the back wall of the housing. The ribs 108 are arranged, when the conduit 100 is installed, to provide support for the conductors 2, 3, 5 and to provide electrical insulation between the upper and lower conductors. Insulation between each of the lower or upper conductors is provided by separate interposed insulating elements (not shown). The conduit 100 described above is arranged for use with a right angle corner. In other embodiments corner conduits for other corner angles are provided including internal and external corners and curved corners of different radii.

Figure 33 is a perspective exploded view of the end cap 99. The housing 103 comprises a box with an open front and side having external cross-sectional dimensions that correspond to those of the conduit 1. The plate 104 comprises two halves arranged at right angles that are the same height as the conduit 1 and arranged to cover the open side and front of the housing 103 and to overlap the joint with the plate 29 of the conduit 1. The housing 103 and the plate 104 carry snap lock fittings 105 (not shown on the plate 104) arranged to engage the housing 103 and plate 104. The rearward face of the housing 103 defines a hole 109 through which a bolt 110 can be entered to secure the cap

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99 to the carrying surface. The cap 99 serves to seal off and insulate the open end of the conduit 1 and the conductors 2, 3, 4.

Bending and folding of conductors 2, 3 and 4 about the vertical axis is possible due to the substantially planar sheets 61, and the spaced apart ribs 66. It will be appreciated that such bending or folding does, in some cases, result in some buckling of segments 70 and ribs 66. While this is preferable avoided, it has been found in practice that this is not critical for domestic power applications as sheet 61 is the main current carrier. In circumstance where more extreme bending or folding is used, it is also possible to buckle sheet 61 or to bring sheet 61 into engagement with ribs 66. In the event that the conductors need only convey power, and not communications signals, then such buckling is rarely problematic, as assembly 5 is typically only mounted to conduit 1, not to an intermediate conduit.

Conductors 2, 3 and 4 are introduced into the respective channels by being feed into the longitudinal ends of conduit 1. However, in other embodiments, the conductors are introduced into respective channels 12, 13 and 14 by progressing through the open ends, in that they are resiliently deformed as they past ridges 35 and 36. The typical end result being, for the example of conductor 2, that edge 65 and end 67 are adjacent to the upper side of ridges 35 and 36. Due to manufacturing tolerances and other factors it is not unusual for only one of edge 65 and end 67 to be engaged with the respective ridges. In fact, this is a design feature of conduit 1 and conductor 2 to ensure that sheet 61 is inclined from the plane through which pin 7 rotates. As will be appreciated from the foregoing description, in this embodiment pin 7 rotates in a vertical plane.

While conductors 2, 3 and 4 are retained within the respective channels, they do have a limited degree of freedom for movement. Particularly, the inclusion and placement of recess 55 encourages conductor 2, in the absence of pin 7, to rest under the influence of gravity such that sheet 61 is inclined by a small amount from the vertical. The inclination is such that end 67 is lower than edge 65. When pin 7 is first progressed past ridges 35 and 36 and into channel 12, its leading edges contact conductor 2. Specifically, one leading edge of pin 7 contacts surfaces 62 adjacent to edge 65, and the other leading edge contacts surface 72. Those contacts need not necessarily initially occur simultaneously. While this action of pin 7 may cause some upward movement of conductor 2, the contact with surface 62 causes conductor 2 to rotate slightly within



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channel 12 such that face 63 is brought into engagement with abutment 37. The engagement with abutment 37 occurs adjacent to edge 64 and, as such, sheet 61 is supported along face 63 at only two spaced apart points, these being at edge 64 – which is engaged with abutment 37 – and at edge 65 – that is abutted against the adjacent wall of channel 12. Accordingly, sheet 61 and surface 62 remain inclined with respect to the vertical.

As pin 7 is further advanced into channel 12, it drives between surface 62 and face 72 to resiliently deform ribs 66 such that surfaces 62 and 68 are moved apart to allow progression of pin 7 into channel 12. As that progression occurs, the leading edge of pin 7 that is engaged with surface 62 slideably progresses along that surface toward edge 64. Moreover, that leading edge, being disposed intermediate edges 64 and 65, resiliently deforms sheet 61 toward the adjacent wall of channel 12 to further facilitate the movement apart of surfaces 62 and 68.

Once the leading edges of pin 7 have progressed from end 67 and past surface 68, the deformation of sheet 61 is such as to bring surface 62 into contact with the adjacent surface of pin 7. In any event, once the leading edges of pin 7 extend to or slightly beyond edge 64, sheet 61 returns to the substantially planar configuration to establish the large contact area between the pin and surface 62.

During the progression of pin 7 into channel 12, ribs 66 are deformed to make way for that progression between surfaces 62 and 68. However, the ribs maintain surfaces 62 and 68 in a resilient clamping bias with pin 7. While sheet 61 is being resiliently deformed the bias will be reduced. However, with pin 7 in the operative position, and surface 62 intimately electrically connected with that pin, the bias will be at a maximum as sheet 61 is, in that configuration, substantially planar and un-deformed.

Channel 12 and conductor 2 also interact such that end 67 of conductor 2 is abutted with the adjacent wall of the channel during the progression of pin 7 into the channel. Additionally, recess 55 ensures that rib 66 does not otherwise engage with that wall of the channel. In this situation, end 67 acts as a lever for applying additional clamping bias between surfaces 62 and 68 and the intermediate pin 7. It also enhances the probability of a large contact surface area between surface 62 and pin 7. An additional advantage is that the ribs adjacent to the rib or ribs that directly engage with

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pin 7 are resiliently urged toward sheet 61 and thereby contribute to locking pin 7 in the operative position.

When pin 7 is rotated from the operative to the movable configuration it is necessary to overcome the clamping and locking forces that have been applied by  
5 conductor 2. However, once this occurs, the sequence of events is substantially the reverse order of that described above.

Some embodiments of the invention are intended for high current applications. One example is a conductor 75 that is illustrated in Figure 14, where corresponding features are denoted by corresponding reference numerals. Sheet 61 includes a  
10 conductive copper strip 76 that is integrally formed with and which extends from edge 65 to overlap with all of face 63. In this embodiment strip 76 extends beyond edge 64. Although a gap is shown between sheet 61 and strip 76, it is preferred that this is minimised or eliminated.

In other embodiments, strip 76 terminates intermediate edges 64 and 65. In  
15 further embodiments, strip 76 is folded back upon itself one or more times.

Conductors 2, 3 and 4 are each formed from a continuous conductive sheet. By way of example, a preferred method of manufacturing conductor 2 will be provided below with reference to Figure 16. It will be appreciated by those skilled in the art that the other conductors are preferably manufactured with the same steps.

20 Initially, use is made of a longitudinally continuous copper sheet 81 having a nominal thickness and width of about 0.35 mm and 18 mm respectively. This is sufficient to provide, in the finished product, a 20 Amp current carrying capacity at 240 Volts AC, along with the required clamping force.

Sheet 81 is significantly smaller than the corresponding sheet used to produce the  
25 prior art device. Accordingly, the raw material costs for the preferred embodiment, for the same current carrying capacity, is considerably less than that offered by the prior art. It also ensures, that for a given length of conductor, that conductor 2 will weigh less than the prior art and, hence, will be less expensive to not only obtain the raw materials, but also to transport the final product for installation.

30 This sheet is cleaned and then punched to form an array of asymmetric disposed longitudinally spaced apart generally rectangular apertures 82. This arrangement is illustrated in Figure 16. The punching operation also introduces four parallel broken

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lines of weakness 83, 84, 85 and 86 that extend longitudinally between the apertures. It will be appreciated that the metal remaining between adjacent apertures is to ultimately define ribs 66.

Sheet 81 is then again cleaned and a flexible plastic sheet 87 is adhered to one face of sheet 81. As sheet 81 is of considerable length, it is usual for a plurality of adjacent sheets 87 being used to collectively cover upward face of sheet 81. Sheet 87, in this embodiment, is made from a flexible resilient plastic sheet and:

1. Provides an electrically insulating and protective cover for the resultant conductor.
2. Facilitates the introduction of the conductor into channel 12 by reducing the likelihood of inadvertent and undesired binding engagement between the ribs and the adjacent channel walls.
3. Provides additional structural integrity to the conductor.
4. Contributes to the formation of constant radius curves between adjacent conductors that are angled with respect to each other.
5. Reduces the risk of entanglement or undesired snagging between adjacent coils of the resultant conductor when included in a multi-layer coil.

In other embodiments, sheet 87 is a laminate. One embodiment (not shown) includes a three layer flexible laminate having:

1. An outer plastic layer for providing the functionality referred to above;
2. An inner adhesive layer for adhering sheet 87 to conductor 2.
3. An intermediate conductive layer, such as a conductive foil, for providing electromagnetic shielding.

Sheet 81 is mandrel bent between lines 85 and 86 to define end 67 and the inclined face 72. A further mandrel bend is affected along a longitudinal central fold line that is parallel with and intermediate lines 83 and 84. The bend along the central fold line is such as to fold sheet 81 by 180° so that it extends back upon itself to form conductor 2, as shown in Figure 11. It will be appreciated that sheet 87 have been omitted from the drawings, other than Figure 16, for the purposes of clarity.

In other embodiments, sheet 87 is not used.

Other punching, bending and folding techniques are also applicable to the manufacture of conductor 2 from sheet 81.

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The punching technique used in the embodiments described in the drawings results in about 17% of copper sheet 81 being converted to waste. That is, conductor 2 includes about 83% of the weight of copper originally included in sheet 81. For the prior art, the waste amounted to about 30% of the weight of the resultant conductor.

5           Once sheet 81 has been formed into conductor 2, it is wound into a multi-layer coil 90, as shown in Figure 13. The coil is subsequently transported to a building site or other installation site where it is progressively uncoiled as conductor 2 is feed into channel 12. Coil 90 is formed by securing an end of conductor 2 to a circular drum 91. Drum 91 has an outwardly facing circumferentially extending surface 92 that is abutted  
10 with face 63 of conductor 2. Drum 91 is rotated to wind conductor 2 about the drum and then over its own length to form coil 90. As the coil is created, the substantially planar face 63 is being engaged with the underlying drum of coil. Accordingly, the risk of inadvertent engagement between ribs in adjacent coils of the multi-layer coil 90 is minimised both during the coiling and uncoiling of conductor 2.

15           The shape and configuration of conductors 2, 3 and 4 provides for a small transverse width of those conductors, as there are only two transversely spaced apart copper components, these being body 61 and ribs 66. Moreover, the sheet 81 is only folded back upon itself once. Even in the Figure 14 embodiment, where sheet 81 is folded back upon itself twice, the additional fold is such that the two components of the  
20 sheet are either closely adjacent or abutted together.

Some prior art conductors include considerably more transversely spaced components, typically four, and are therefore require more material to make, are more difficult to make, and are transversely wider. It is also more usual for the prior art conductors to include many folds back upon its length. The conductors of the present  
25 embodiments, however, are minimally transversely wider than the respective pin that they are intended to engage. This allows conduit 1 to be: thinner; less intrusive in retrofit installations; and installed in smaller cavities or spaces that would have been achieved through use of the prior art referred to above.

Other advantages of the preferred embodiments are that they provide for:

30           1. A reduction in the cost of: the required raw materials; the manufacture; the handling and transportation; and the installation. As presently understood,

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the total cost of purchase and installation of the preferred embodiment of Figure 15 should be about half that of an equivalent prior art system.

2. A reduction in the amount of waste generated from the production of the conductor.
- 5 3. Increased safety through the provision of closures, and in particular closure 39.
4. The earth contact to be the first to contact, and the last to leave contact, with the respective conductor.
- 10 5. A reduced number of components, particularly for conduit 1. In the preferred embodiment, with the exception of conductors 2, 3 and 4, conduit 1 includes only three components, these being bracket 21, bracket 28 and closure 39. However, in embodiments where closure 39 is integrally formed with bracket 21, conduit 1 includes only two components.
- 15 6. A reduction in the installation time and the logistics in arranging for that installation due to the fewer required components. That is, separate components need to be separately sourced, cut to size and assembled. Accordingly, the far diminished number of components required by the present embodiments facilitates the installation of conduit 1.
- 20 7. Accommodates longitudinal progression of the conductors within the respective channels. This reduces point loading of the conductors and allows for uniform bends to be formed by those conductors as they extend between conduits.

As will be understood by those skilled in the art, the electrical insulation provided the conduit and the dimensions and materials of the pins and conductors used  
25 in embodiments of the invention are designed to take into account the voltages and currents with which they are used. Higher voltages will require greater insulation and higher currents will require more substantial conductors and pins.

Although the invention has been described with reference to specific examples, it  
30 will be appreciated by those skilled in the art that it may be embodied in many other forms.

**Claims**

- 1) An elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:  
a longitudinally extending elongate body for defining a first contact surface; and  
5 a plurality of longitudinally spaced apart ribs that extend from the body to respective free ends that are spaced apart from the first contact surface for allowing the contact to be progressed between the body and one or more of the ribs, each rib including a respective second contact surface that is opposed with the first surface wherein, upon progression of the contact between the body and the one or more ribs, the  
10 first surface and the respective one or more second surfaces are resiliently biased into engagement with the contact.
- 2) An elongate electrical conductor according to claim 1 in which the spacing between the free ends and the first contact surface is greater than the spacing between the first and second contact surfaces.
- 15 3) An elongate electrical conductor according to claim 1 in which the ribs are resiliently mounted to the body.
- 4) An elongate electrical conductor according to claim 1 in which the ribs are resilient.
- 5) An elongate electrical conductor according to claim 1 in which the body is a  
20 conductive sheet having two opposite elongate longitudinally extending edges, wherein the ribs extend from one of the edges.
- 6) An elongate electrical conductor according to claim 5 in which the body includes a further conductive strip that extends from the other of the edges.
- 7) An elongate electrical conductor according to claim 6 in which the further  
25 conductive strip is used in high current applications.
- 8) An elongate electrical conductor according to claim 1 in which the adjacent free ends are mechanically connected to collectively increase the resilient bias.
- 9) An elongate electrical conductor according to claim 1 in which the adjacent  
30 free ends are mechanically connected by respective intermediate integrally formed segments.

10) An elongate electrical conductor according to claim 9 in which the segments collectively define with the free ends an engagement face for guiding the progression of the contact into biased engagement with the first and second surfaces.

11) An elongate electrical conductor according to claim 10 in which the  
5 engagement face is continuous.

12) An elongate electrical conductor according to claim 10 in which the engagement face is opposed with and inclined away from the first surface

13) An elongate electrical conductor according to claim 10 in which the engagement face extends between an inner edge and an outer edge that terminates  
10 opposite the other edge.

14) An elongate electrical conductor according to claim 13 in which when the first and second surfaces are biased into engagement with the contact, the inner edge abuts the contact.

15) An elongate electrical conductor according to claim 1 in which the ribs  
15 restrain longitudinal movement of the contact.

16) An elongate electrical conductor according to claim 1 in which the conductor is formed from a continuous conductive sheet that is folded upon itself along a longitudinal fold line.

17) An elongate electrical conductor according to claim 1 in which the sheet is  
20 punched to form the ribs.

18) An elongate electrical conductor according to claim 1 in which the sheet is cut or otherwise formed.

19) An elongate electrical conductor according to claim 1 in which the first contact surface is substantially planar and the second contact surfaces are arcuate.

20) An elongate electrical conductor according to claim 1 in which the second  
25 contact surfaces include a compound arc.

21) An elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate first body for defining a substantially planar  
30 contact surface; and

a longitudinally extending elongate second body being mounted to the first body for defining an arcuate contact surface that is opposed with the planar surface wherein,

upon progression of the contact between the first and second bodies, the planar and the arcuate surfaces are resiliently biased into engagement with the contact.

22) An elongate electrical conductor according to claim 21 in which the arcuate contact surface is segmented.

5           23) An elongate electrical conductor according to claim 21 in which the second body includes a plurality of longitudinally spaced apart ribs that extend from the first body to respective free ends which collectively define the arcuate surface.

24) An elongate electrical conductor according to claim 23 in which the free ends are mechanically connected.

10           25) An elongate electrical conductor according to claim 21 in which the free ends are mechanically interconnected by respective intermediate integrally formed segments.

26) An elongate electrical conductor according to claim 21 in which the first body is substantially planar and includes two opposite faces, one of which defines the planar contact surface.

15           27) An elongate electrical conductor according to claim 21 in which the second body is arcuate and includes opposite convex and a concave faces, the formed defining the arcuate contact surface.

28) A conduit for an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conduit including:

20           a longitudinally extending housing;

          one or more mounting formations disposed within the housing for captively retaining the conductor to the housing;

          an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

25           a closure that is mounted to the housing for moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening respectively.

29) A conduit for an elongate electrical conductor according to claim 28 in which the closure is mounted to the housing for rotation between the open and closed  
30 configurations.

30) A conduit for an elongate electrical conductor according to claim 28 in which the closure is hinged to the housing.



31) A conduit for an elongate electrical conductor according to claim 28 in which the closure is resiliently biased toward the closed configuration.

32) A conduit for an elongate electrical conductor according to claim 28 in which the closure is resiliently biased toward the closed configuration by an internally disposed  
5 biasing means or spring.

33) A conduit for an elongate electrical conductor according to claim 28 in which the closure includes a longitudinal line of weakness about which it is resiliently deformed from the closed configuration.

34) A conduit for an elongate electrical conductor according to claim 28 in which  
10 the contact is part of a contact assembly and, as the assembly is progressed into the opening, the closure is moved toward to open configuration.

35) A conduit for an elongate electrical conductor according to claim 34 in which the contact assembly engages the closure to effect progression toward the open configuration.

15 36) A conduit for an elongate electrical conductor according to claim 28 in which the mounting formation is a retaining channel that extends continuously through the housing.

37) A conduit for an elongate electrical conductor according to claim 28 in which the channel includes a continuous open end for receiving the contact.

20 38) A conduit for an elongate electrical conductor according to claim 37 in which the open end is downwardly facing.

39) A conduit for an elongate electrical conductor according to claim 37 in which the open end defines the bottom of the channel.

25 40) A conduit for an elongate electrical conductor according to claim 28 in which the housing includes a plurality of spaced apart channels for captively retaining respective conductors.

41) A conduit for an elongate electrical conductor according to claim 40 in which the channels are parallel.

30 42) A conduit for an elongate electrical conductor according to claim 40 in which the channels longitudinally coextend and are transversely spaced apart.

43) A conduit for an elongate electrical conductor according to claim 28 in which the housing is extruded.

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44) A conduit for an elongate electrical conductor according to claim 28 in which the closure, in the closed configuration, extends across the opening.

45) A conduit for an elongate electrical conductor according to claim 28 in which the opening extends longitudinally and the conduit includes a plurality of closures that, in the closed configuration, collectively extend longitudinally across substantially all of the opening.

46) A conduit for an elongate electrical conductor according to claim 28 in which movement of one closure between the open and closed configuration occurs independently of movement of any other of the closures.

47) A conduit for an elongate electrical conductor according to claim 28 in which the closures are modular.

48) A conduit for an elongate electrical conductor according to claim 28 in which the closures are formed from an elongate strip and interposed with longitudinally running slots.

49) A conduit for an elongate electrical conductor according to claim 28 in which the housing includes a channel on its rear face for use with adhesive tape for fixing the housing to a carrying surface.

50) A conduit for an elongate electrical conductor according to claim 28 in which the housing includes an internal cavity for housing the head of a fixing means for fixing the housing to a carrying surface.

51) A conduit for an elongate electrical conductor according to claim 28 in which the closure is mounted inside the housing and, in the closed configuration, extends upwardly from the housing and across the opening.

52) A conduit for an elongate electrical conductor according to claim 28 in which the closure is hinged at or adjacent to the housing wherein the movement between the open and closed configurations occurs within the housing.

53) A conduit for an elongate electrical conductor according to claim 28 in which the opening includes two opposite edges and the closure extends from a mounting end that is hingedly engaged with the housing adjacent to one of the opposite edges, to a free end that, in the closed configuration, is disposed adjacent to the other of the opposite edges.

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54) A conduit for an elongate electrical conductor according to claim 28 in which the mounting formation includes a locating formation for orientating the conductor for resilient deformation upon engagement with the contact.

55) A conduit for an elongate electrical conductor according to claim 54 in which the conductor includes a plurality of engagement faces for engaging with the contact, and the locating formation orientates the engagement faces for resiliently deforming into engagement with the contact.

56) A conduit for an elongate electrical conductor according to claim 54 in which the locating formation is a protrusion that extends from the mounting formation.

57) A conduit for an elongate electrical conductor according to claim 28 in which the mounting formation includes a channel having an open end defined by the opening.

58) A conduit for an elongate electrical conductor according to claim 28 in which the opening is downwardly facing.

59) A conduit for an elongate electrical conductor according to claim 28 in which the closure is a flap that, in the closed configuration, extends across substantially all of the opening and which is resiliently deformed by the contact into the open configuration.

60) A conduit for an elongate electrical conductor having two opposed engagement elements that are adapted for electrically connecting with an electrical contact, one of the elements being substantially planar and the other being arcuate, the conduit including:

a longitudinally extending housing;

one or more mounting formations disposed within the housing for captively retaining the conductor to the housing;

an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

one or more locating formations associated with the mounting formations for orientating the conductor to ensure that the substantially planar engagement face is inclined with respect to the contact.

61) A conduit for an elongate electrical conductor according to claim 60 in which the conduit includes a closure that is mounted to the housing for moving between an open configuration and a closed configuration with respect to the opening when the contact is and is not received within the opening.

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62) A conduit for an elongate electrical conductor according to claim 60 in which the arcuate engagement face includes a compound arc.

63) A conduit for an elongate electrical conductor according to claim 60 in which the mounting formations captively retain the conductor within the housing.

5 64) A conduit for an elongate electrical conductor according to claim 60 in which the conductor is partially or substantively disposed outside of the housing.

65) A conduit for an elongate electrical conductor according to claim 60 arranged to carry three or more elongate electrical conductors to provide a plurality of circuits.

10 66) A conduit for an elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conduit including:

a longitudinally extending housing;

an open ended channel disposed within the housing for captively retaining the conductor within the housing;

15 an opening in the housing for receiving the contact and thereby allowing the contact to be brought into engagement with the conductor; and

a closure that is disposed within the housing adjacent to the open ended channel for moving between a closed configuration and an open configuration for providing a barrier to unintended access to the conductor.

20 67) A conduit for an elongate electrical conductor according to claim 66 in which the closure is moved into the open configuration when the contact is brought into engagement with the conductor.

68) A conduit for an elongate electrical conductor according to claim 66 in which only that portion of the closure adjacent to the contact is moved into the open configuration.

25 69) A contact assembly for electrically connecting with a plurality of conductors contained within a conduit, the contact including:

a housing that is movable into engagement with the conduit; and

a plurality of contact formations mounted to the housing and which are movable into engagement with respective conductors in a predetermined sequence.

30 70) A contact assembly according to claim 69 in which the housing is movable into releasable engagement with the conduit and the contact formations are movable into releasable engagement with the respective conductors.

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71) A contact assembly according to claim 69 in which the contact formations include at least two pins, wherein one of the pins protrudes further from the housing than the other.

72) A contact assembly according to claim 69 in which the contact formations  
5 include three parallel pins that extend transversely from the housing and terminate at free ends that are transversely spaced apart.

73) A contact assembly according to claim 69 in which including at least two parallel pins and the relative transverse offset between the pins and the respective conductors is such as to provide the predetermined sequence.

10 74) A contact assembly according to claim 73 including an active pin and a neutral pin, and the predetermined sequence comprises the neutral pin and then the active pin engaging the respective conductors.

75) A contact assembly according to claim 73 including an active pin, a neutral pin and an earth pin, and the predetermined sequence comprises the earth pin and then  
15 the neutral pin and the active pin engaging the respective conductors.

76) A contact assembly according to claim 73 in which the neutral pin and the active pin substantially simultaneously engage with respective conductors.

77) A contact assembly according to claim 73 in which the predetermined sequence comprises the earth pin and then the neutral pin and then the active pin  
20 engaging the respective conductors.

78) A contact assembly according to claim 73 in which the pins are movable out of engagement with the respective conductors, that movement occurring in the reverse of the predetermined sequence.

79) A contact assembly according to claim 73 in which the pins are biased to  
25 move out of engagement with the respective conductors.

80) A contact assembly according to claim 73 further comprising a cam arranged to bias the pins into engagement with the respective conductors.

81) A contact assembly according to claim 73 in which the pins are provided with connectors for connecting to respective cables for conducting power or signals to or  
30 from the conductors.

- 40 -

82) A contact assembly according to claim 73 in which the pins are integrally formed with the housing and respective cables for conducting power or signals to or from the conductors.

83) A contact assembly according to claim 73 in which the pins are connected to  
5 respective socket formations for conducting power or signals to or from the conductors.

84) A contact assembly according to claim 73 in which the pins are provided in the reverse order to enable the contact assembly to be brought into engagement with the conductors from an alternative direction.

85) A contact assembly according to claim 73 in which the pins are arranged for  
10 engagement with a sub-set of the conductors in the conduit.

86) A contact assembly according to claim 73 in which the housing is provided with means to indicate to a user that the contact assembly is in engagement with the respective conductors.

87) A contact assembly according to claim 73 in which the guide provides a  
15 visual indication to the user.

88) A contact assembly according to claim 73 in which the housing includes a visually distinct portion, and the guide includes a window through which the user is able to view the portion when the contact assembly is in engagement with the respective conductors.

20 89) An elongate electrical conductor that is adapted for electrically connecting with an electrical contact, the conductor including:

a longitudinally extending elongate conductive sheet having a first face and a second face opposite to the first face, wherein the first face defines a first contact surface; and

25 a plurality of longitudinally spaced apart ribs that extend transversely from the sheet and back along at least a portion of the first contact surface but not along the second face, each rib including a respective second contact surface wherein, upon progression of the contact between the sheet and the one or more ribs, the first surface and the respective one or more second surfaces are resiliently biased into engagement  
30 with the contact.

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90) An elongate electrical conductor according to claim 89 in which the faces are joined along a first common longitudinal edge and a second common longitudinal edge and the ribs extend from the first edge and terminate in respective free ends.

91) An elongate electrical conductor according to claim 90 in which the second  
5 contact surfaces are disposed intermediate the first edge and the respective free ends.

92) An elongate electrical conductor according to claim 90 in which the free ends terminate between the first and second edges.

93) An elongate electrical conductor according to claim 90 in which the free ends extend beyond the second edge.

10 94) An elongate electrical conductor according to claim 90 in which the free ends do not extend around the second edge.

95) A contact assembly for electrically connecting with a plurality of conductors contained within a conduit, the contact including:

a housing that is movable into engagement with the conduit;

15 a plurality of contact formations mounted to the housing and which are movable into engagement with respective conductors; and

a guide that is mounted to the housing and which provides an external indication that the contact formations are in engagement with the respective conductors.

20 96) A contact assembly according to claim 95 in which the housing includes a visually distinct portion, and the guide includes a window that overlies and through which the portion is viewable when the contact formations are in engagement with the respective conductors.

97) A contact assembly according to claim 96 in which the portion is otherwise substantially obscured from view.

25

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2003/001691

## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos :  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please see attached extra sheet.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1-20, 89-94.

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2003/001691

## Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

### Continuation of Box No II:

1. Claims 1-20 and 89-94 are directed to an elongate electrical conductor including a longitudinally extending elongate body defining a first contact surface, a plurality of longitudinally spaced apart ribs that extend from the body to respective free ends that are spaced apart from the first contact surface, each rib including a respective second contact surface that is opposed to the first contact surface, upon progression of a contact between the body and one or more ribs the first and second surfaces are resiliently biased into engagement with the contact. It is considered that the plurality of spaced apart ribs that extend from the elongate first contact surface to the respective second contact surface, resiliently biasing a contact between the contact surfaces comprises a first "special technical feature".

2. Claims 21-27 are directed to an elongate electrical conductor including a first longitudinally extending elongate body having a planar contact surface and a second longitudinally extending elongate body mounted to the first body defining an arcuate contact surface that is opposed to the planar contact surface, upon progression of a contact between the first and the second bodies, the planar and arcuate surfaces are resiliently biased into engagement with the contact. It is considered that the planar contact surface of the first body and the arcuate contact surface of the second body resiliently biasing a contact between the contact surfaces comprises a second "special technical feature".

3. Claims 28-68 are directed to a conduit housing having mounting formations disposed in the housing to retain an elongate electrical conductor and an opening for receiving a contact and allowing the contact to be brought into engagement with the conductor. It is considered that the conduit housing having mounting formations disposed in the housing to retain an elongate electrical conductor and an opening for receiving a contact and allowing the contact to be brought into engagement with the conductor comprises a third "special technical feature".

4. Claims 69-88 are directed to a contact assembly including a housing, plurality of contacts mounted in the housing which are movable into engagement with respective conductors within a conduit in a predetermined sequence. It is considered that the contact assembly including a housing, plurality of contacts mounted in the housing which are movable into engagement with respective conductors within a conduit in a predetermined sequence comprises a fourth "special technical feature".

5. Claims 95-97 are directed to a contact assembly including a housing, plurality of contacts mounted in the housing which are moveable into engagement with respective conductors within a conduit, a guide mounted to the housing provides external indication regarding engagement. It is considered that the contact assembly including a housing, plurality of contacts mounted in the housing which are moveable into engagement with respective conductors within a conduit, and a guide mounted to the housing providing external indication regarding engagement comprises a fifth "special technical feature".

# INTERNATIONAL SEARCH REPORT

International application No.

**PCT/AU2003/001691**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	9612327	AU	36449/95	BR	9509335	CA	2202536
		EP	0787373	NZ	293885	US	2001040040
WO	9303517	AU	24215/92	BR	9206402	CA	2114617
		EP	0597980	FI	940518	HU	67892
		SG	43100	US	5618192		
EP	1283578	CN	1407669	FR	2828591		
WO	0109988	AU	59560/00	BG	106353	CZ	20020350
		FI	20020147	HU	0202185	NO	20020418
		SK	1902002				
EP	0544031						
GB	2132825						
US	4493516	BE	884045	CH	657238	DE	3024244
		FR	2460556	GB	2053591	NL	7907278
		ZA	8000547				
END OF ANNEX							

"Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001."

**HIGGINS v SINCLAIR (No 2) - BC201102168**

Supreme Court of New South Wales  
Johnson J

2009/297946

31 March 2011

Higgins v Sinclair (No 2) [2011] NSWSC 238

**DEFAMATION -- Misleading and deceptive conduct -- Consequential orders -- Form of declaratory and injunctive relief.**

(NSW) Fair Trading Act 1987

*Higgins v Sinclair* [2011] NSWSC 163, cited

Johnson J.

[1] On 18 March 2011, I gave judgment in these proceedings: *Higgins v Sinclair* [2011] NSWSC 163. For reasons expressed in that judgment, I indicated that I would award damages in favour of each of the First and Second Plaintiffs in the sum of \$100,000.00, together with interest. I indicated, as well, that I was satisfied that injunctive and declaratory relief should be granted to the Plaintiffs. I stood the proceedings over until today, and directed the Plaintiffs to provide draft orders to the court and the Defendant, together with short submissions explaining why particular orders were being sought.

[2] I note that both Mr Smark SC, for the Plaintiffs, and the Defendant (appearing in person) were present in court on 18 March 2011. I fixed today's hearing for 9.30 am, after consulting the Defendant whether that time suited him or whether he wished it to be later in the day. I was conscious that the Defendant lives outside Sydney (in the Port Macquarie area) and that a later time may facilitate his attendance, if he wished to attend. He indicated that he did not wish to have a later time today, and that it may be that he would stay overnight in Sydney.

[3] The matter was called on this morning. The Defendant has not appeared. It is now 9.57 am. It may be, from the tenor of an email which he has sent, that he has determined not to come to court today, although he has not communicated that intention directly to my Associate nor to the Plaintiffs.

[4] As a result of the orders made on 18 March 2011, the Plaintiffs furnished to the court and to the Defendant draft orders and submissions on 22 March 2011. The Defendant was given an opportunity to indicate his position concerning the draft orders. He sent an email to the court on 28 March 2011 which has, in several respects, revisited a number of matters raised by him at the hearing. His email (MF12) does not in fact address directly any of the proposed orders. However, the Defendant clearly had an opportunity to consider the proposed orders, and I am satisfied that he is on notice of the orders which I am asked to make today.

[5] The issues which were flagged for possible consideration on the last occasion have been somewhat reduced.

[6] Firstly, the Plaintiffs do not maintain their claim for prejudgment interest and no order is sought in that regard.

[7] Secondly, the Plaintiffs submit that costs should follow the event, but they do not seek any special order as to costs against the Defendant.

**PATENT**

**[8]** There are a number of declarations and injunctions contained in the proposed orders. I should say something briefly about them to explain the approach which I will take.

**[9]** The first proposed declaration is that Power & Data Corporation Pty Ltd owns the intellectual property in the Mainline system. This declaration was sought in prayer 7 of the Further Amended Statement of Claim. It will be apparent from my judgment that there was an issue in the case concerning statements made by the Defendant, in various forms, concerning the ownership of the intellectual property in the Mainline system. I accept the submissions of the Plaintiffs that the effect of the findings which I have made renders it both appropriate and necessary to make a declaration in the form which is sought.

**[10]** As the judgment reveals, the Defendant has expressed views, and strong views, about issues of inventorship and the roles of other persons, who are not parties to these proceedings. The issue that I had to decide, as a live issue in these proceedings, related directly to whether Power & Data Corporation Pty Ltd owned the intellectual property in the Mainline system. That issue was answered clearly in favour of the Plaintiffs. The making of this declaration will settle the issue as between Power & Data Corporation Pty Ltd and the Defendant. It has the benefit of promoting finality of litigation, at least between these parties.

**[11]** Whether the Defendant seeks to make any application in any other forum with respect to issues of inventorship, concerning persons who are not parties to these proceedings, is a matter about which I express no view. What is clear is that the making of this declaration settles the issue as between the parties to this litigation. I am satisfied that such a declaration ought to be made.

**[12]** The next set of declarations are sought to be made pursuant to s 72 Fair Trading Act 1987. The declarations sought are that the Defendant has engaged in misleading and/or deceptive conduct by representing seven stated matters. The seven stated matters flow directly from the representations referred to in the proceedings and my findings. I consider it appropriate, in the circumstances of this case, to make declarations 2(a) to 2(g).

**[13]** The general orders whereby there will be verdicts for the First and Second Plaintiffs in the nominated sums, and judgment for the Third Plaintiff are not controversial and I will make those orders in due course.

**[14]** That brings me to the question of injunctive relief. That relief was sought with respect to both the defamation proceedings by the First and Second Plaintiffs and the Fair Trading Act 1987 proceedings by the Third Plaintiff. I indicated in my principal judgment that I was persuaded, in the circumstances of this case, that injunctive relief was appropriate. I should observe that the content of the Defendant's email of 28 March 2011 (MFI2) reinforces that view in my mind.

**[15]** The form of the injunctive relief sought by the Plaintiffs has been carefully drawn. It seeks, in effect, orders of the court restraining the Defendant from making defamatory and misleading statements of the type which he has made in the past on more than one occasion.

**[16]** Each of the injunctions is expressed as a permanent restraint. However, the Plaintiffs acknowledge that orders in this form would not prevent the Defendant from seeking to have such orders varied or discharged upon a proper basis in the future. Further, there is built into the proposed injunctive relief, provision for the Defendant to seek the consent of the Plaintiffs to certain communications being made.

**[17]** I bear in mind that there is a pattern of behaviour disclosed in this case whereby the Defendant, almost invariably by email, although in the offending website as well, uses strong and intemperate language paired with defamatory and misleading statements. A reading of my primary judgment will make clear what I mean in that respect.

**[18]** The court will not lightly make orders restraining a person from communicating with others. However, the Plaintiffs have brought these proceedings and have succeeded clearly. For reasons explained in my principal judgment, a clear foundation exists for injunctive relief.

**[19]** I should, however, make this observation. As will be apparent from the transcript of today's ex-parte hearing, both senior counsel for the Plaintiffs and the court acknowledge that these orders should not operate to shut out the Defendant from having an opportunity to make, using temperate and non-defamatory language, communications with appropriate authorities concerning safety issues, including the requirements of Australian Standards and matters of that type. If the Defendant seeks to take such a course, then it may be expected that

**PATENT**

**REEL: 028904 FRAME: 0213**

the Plaintiffs will not seek to prevent him from doing so. If the Plaintiffs did not consent to such communications, then the court would readily entertain an application by the Defendant to vary the orders so that such communications could be made.

[20] It is self evident, from the terms of my principal judgment, that the Plaintiffs themselves have a close interest in the Mainline system operating safely. It would be in no one's interest, if there were legitimate safety issues which were sought to be brought to the attention of relevant authorities, for the Defendant to be prevented from raising those matters.

[21] However, the problem so far has been, as I have said, the intemperate and strong language used by the Defendant and its defamatory and misleading content. Intermingled in the Defendant's statements is a type of foundational grievance concerning inventorship, which seems to colour his approach to statements made with respect to safety issues. I say no more about that. A fair reading of my primary judgment will disclose what I mean.

[22] Clearly, the Defendant has considerable practical knowledge about this system. It is not the role of the court to make orders that stop him from raising legitimate safety issues with the appropriate authorities in temperate and non-defamatory terms.

[23] I will take steps to have both the transcript of today, and a copy of this judgment, sent to the Defendant so that he is aware of what has been said in court by senior counsel for the Plaintiffs and by me.

[24] I am satisfied, in the circumstances of this case, that the injunctive relief sought is entirely appropriate and that it involves a measured approach to properly protect the legitimate interests of the Plaintiffs, who have succeeded in these proceedings, while at the same time leaving open a proper avenue for the Defendant to raise any legitimate issues he wishes to raise in temperate and non-defamatory terms.

[25] I make declarations in terms of the declarations contained in paras 1 and 2 of the Orders which I have signed and dated today.

[26] In addition, I give verdicts and judgments in terms of paras 1 through to 5, on p 2 of the Orders which I have signed and dated today.

[27] Further, I grant injunctions in terms of paras 6, 7, 8 and 9 on pp 2 to 4 of the Orders which I have signed and dated today.

[28] I make an order as to costs in accordance with para 10 of the Orders on p 4 which I have signed and dated today.

[29] I give a direction with respect to the exhibits, in accordance with the direction on p 4 of the Orders which I have signed and dated today.

## Orders

The court declares that:

- (1) Power & Data Corporation owns the Intellectual Property in the Mainline system.
- (2) The defendant has engaged in misleading and/or deceptive conduct by representing that:
  - (a) Power & Data Corporation would go into liquidation, leaving its customers responsible for the cost of rewiring their homes;
  - (b) The Mainline system developed and marketed by Power & Data Corporation was likely to cause avoidable death or injury to children, because it was more dangerous than conventional power conduction systems;
  - (c) Power & Data Corporation does not own the Intellectual Property in the Mainline system;
  - (d) Power & Data Corporation had stolen the defendant's intellectual property in the Mainline system from him;
  - (e) Power & Data Corporation was responsible for the Mainline system which was so dangerous that it would lead to claims for compensation for loss of life, injury or property;
  - (f) The intellectual property in the Mainline system produced by Power & Data Corporation Pty

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- Ltd was stolen from the inventor;
- (g) The validity or efficacy of the patent for the Mainline system was in doubt because extra inventors' names had been added to the patent;

The court orders:

- (1) Verdict for the first plaintiff.
- (2) Verdict for the second plaintiff.
- (3) Judgment for the first plaintiff in the sum of \$100,000.00.
- (4) Judgment for the second plaintiff in the sum of \$ 100,000.00.
- (5) Judgment for the third plaintiff.
- (6) That the defendant be permanently restrained, by himself, his servants or agents, from publishing any matter substantially to the same effect as any part of the publications comprised by Exs A2, B or C in these proceedings, except with the express prior written permission of all of the plaintiffs.
- (7) Without limiting order 6, that the defendant be permanently restrained, by himself, his servants or agents, from publishing any matter substantially to the effect of any of the following matters, except with the express prior written permission of the first plaintiff:
  - (a) The first plaintiff has conspired with others to steal the intellectual property in the Mainline product from the defendant;
  - (b) The first plaintiff, as a director of Power & Data Corporation, has permitted the sale of the Mainline product to Australian schools, despite knowing that the product was much more dangerous than conventional electrical wiring systems.
- (8) Without limiting order 6, that the defendant be permanently restrained, by himself, his servants or agents, from publishing any matter substantially to the effect of any of the following matters, except with the express prior written permission of the second plaintiff:
  - (a) The second plaintiff has cynically sought to promote a product which he knew would fail, to make the government and tax-payers end up paying for the cost to replace the product when it did fail;
  - (b) The second plaintiff, as a director of Power & Data Corporation, has permitted the sale of the Mainline product to Australian schools, despite knowing that the product was much more dangerous than conventional electrical wiring systems.
- (9) Without limiting order 6, that the defendant be permanently restrained, by himself, his servants or agents, from publishing any matter substantially to the effect of any one or more of the following matters, except with the express prior written permission of the third plaintiff:
  - (a) Power & Data Corporation will go into liquidation, leaving its customers responsible for the cost of rewiring their homes;
  - (b) The Mainline system developed and marketed by Power & Data Corporation is likely to cause avoidable death or injury to children, because it is more dangerous than conventional power conduction systems;
  - (c) Power & Data Corporation is responsible for the Mainline system which is so dangerous that it would lead to claims for compensation for loss of life, injury or property;
  - (d) Power & Data Corporation has stolen the defendant's intellectual property in the Mainline system from him;
  - (e) The validity or efficacy of the patent for the Mainline system is in doubt because extra inventors' names had been added to the patent;
  - (f) Power & Data Corporation does not own the Intellectual Property in the Mainline system;
  - (g) The intellectual property in the Mainline system produced by Power & Data Corporation Pty Ltd was stolen from the inventor.
- (10) The defendant to pay the plaintiffs' costs as agreed or assessed.

The court directs that the exhibits may be returned to the parties after 28 days from the making of these orders unless a notice of appeal or notice of intention to appeal is lodged within that time by the defendant. The court further directs that should the exhibits be returned to the parties, the plaintiffs' solicitor is to keep safe custody of

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Exs A2, B and C, and is to provide legible copies of those particular exhibits to the defendant, within a reasonable time after taking custody of such exhibits.

**Order**

Verdicts, judgments, declarations and injunctions, orders and directions made in accordance with Orders dated 31 March 2011.

Counsel for the plaintiffs: *Mr KP Smark SC*

Solicitors for the plaintiffs: *Doyle Watson Solicitors*

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**RECORDED: 04/05/2012**

**REEL: 028004 FRAME: 0216**