

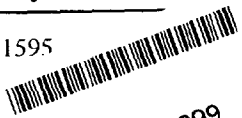
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Attorney
Docket No.

06-30-1999

FORM PTO-1595
(Rev. 6-97)
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U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

101079571

06-16-1999
U.S. Patent & TMO/TM Mail Rcpt Dt. #34

To the Honc.

Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):
Danford Technologies, Inc.

Additional name(s) of conveying party(ies) attached? Yes No

2. Name and address of receiving party(ies):
NationsBank, N.A. d/b/a Bank of America, N.A., as Agent
Attention: Craig S. Wall
700 Louisiana, 7th Floor
Houston, Texas 77002

3. Nature of conveyance:
 Assignment Merger
 Security Agreement Change of Name
 Other _____

Execution Date: June 14, 1999

Additional name(s) and address(es) attached? Yes No

4. Application number(s) or patent number(s): Patent No. 5,538,207
If this document is being filed together with a new application, the execution date of the application is: _____
A. Patent Application No.(s) | B. Patent No.(s)
Additional numbers attached? Yes No

5. Name and address of party to whom correspondence concerning document should be mailed:

Porter & Hedges, L.L.P.
Attention: Mr. Nick H. Sorensen
700 Louisiana, 35th Floor
Houston, Texas 77002

6. Total number of applications and patents involved: 1
7. Total fee (37 CFR 3.41): \$ 40.00
 Enclosed
 In the event of any under or over payment you are authorized to charged our deposit account
8. Deposit account number:

(attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

9. Statement and signature.
To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.
Brad Eastman Signature June 14, 1999 Date
Name of Person Signing
Total number of pages including cover sheet, attachments, and document: 13

Mail documents to be recorded with required cover sheet information to:
Commissioner of Patents and Trademarks, Box Assignments
Washington, D.C. 20231

06/29/1999 DNGUYEN 00000278 5538207
01 FC:581 40.00 DP

PATENT
REEL: 010052 FRAME: 0007

PATENT COLLATERAL ASSIGNMENT

THIS PATENT COLLATERAL ASSIGNMENT (this "*Assignment*") is made as of June 14, 1999 by and between Danford Technologies, Inc., a corporation organized under the laws of British Columbia, Canada ("*Assignor*") and NationsBank, N.A. d/b/a Bank of America, N.A., as Agent, for the ratable benefit of the Lenders ("*Assignee*").

RECITALS:

A. Quanta Services, Inc., a Delaware corporation and an Affiliate of Assignor ("*Borrower*"), the various financial institutions from time to time parties thereto (collectively, the "*Lenders*"), and Assignee have entered into that certain Third Amended and Restated Secured Credit Agreement dated as of June 14, 1999 (as the same may be amended, restated, or supplemented from time to time, the "*Credit Agreement*"), under which the Lenders have agreed from time to time to make loans and other financial accommodations to Borrower.

B. Assignor is the owner of the entire right, title and interest in and to the patents and patent applications described in attached *Exhibit A* annexed hereto and made a part hereof.

C. As a condition precedent to the making such loans and financial accommodations under the Credit Agreement, Assignor is required to execute and deliver this Assignment.

NOW THEREFORE, in consideration of the premises and the covenants herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged and accepted, the undersigned parties agree as set forth below.

1. Definitions. As used in this Assignment:

"*Collateral*" is defined in *Section 2*.

"*Event of Default*" means an Event of Default under and as defined in the Credit Agreement.

"*Intellectual Property*" is defined in *Section 2*.

"*Obligations*" means the obligations under and as defined in the Credit Agreement.

2. Grant of Security Interest. Assignor hereby assigns to Assignee all of Assignor's now-existing or hereafter acquired right, title and interest in and to the patents and patent application identified on *Exhibit A* and any and all patents and patent applications relating in any way to the subject matter of the patents or patent applications identified in *Exhibit A* and all reissues, renewals, extensions, continuations, continuations-in-part and divisions thereof (hereinafter "*Intellectual Property*"), and any and all proceeds thereof, including, without limitation, licenses, royalties, income, payments and any claims by Assignor against third parties for infringement of the Intellectual Property (collectively, with the Intellectual Property, the "*Collateral*").

3. Obligations Secured. This assignment is made to Assignee to secure the payment and performance in full of the Obligations (under and as defined in the Credit Agreement).

4. Warranties And Covenants.

a. Payment. Assignor will, and will cause Borrower and each Guarantor to, pay and perform in full all of the Obligations according to their terms.

b. Good Title. All of the existing Collateral is valid and subsisting in full force and effect, such Collateral represents all of the Intellectual Property used in or necessary for the conduct of the business of Assignor, Assignor owns all right, title and interest thereto or has valid licenses to use such Collateral, and the Assignor has right and power to grant the assignments granted hereunder. The Collateral is not subject to any liens, claims, mortgages,

assignments, licenses, security interest or encumbrances of any nature whatsoever, except the assignment granted hereunder.

c. No Transfer. Assignor will not assign, sell, mortgage, lease, transfer, pledge, hypothecate, grant a security interest in or lien upon, encumber, grant an exclusive or non-exclusive license relating to, or otherwise dispose of any of the Collateral without the prior written consent of Assignee, except as expressly permitted under the Credit Agreement.

d. Lien Perfection. Assignor will, at Assignor's sole cost and expense, perform all acts and execute, perfect, maintain, record or enforce the assignment in the Collateral hereunder or to otherwise further the provisions of this Assignment. Assignor hereby authorizes Assignee to execute and file one or more financing statements (or similar documents) with respect to the Collateral, signed only by Assignee.

e. Power of Attorney. Assignor will, concurrently with the execution and delivery of this Assignment, execute and deliver to Assignee ten (10) originals of a Power of Attorney in the form of *Exhibit B* annexed hereto for the implementation of the assignment, sale or other disposition of the Collateral pursuant to Assignee's exercise of the rights and remedies granted to Assignee hereunder.

f. Litigation. Assignor has no knowledge of any rights, claims or other encumbrances that purport to preclude Assignor from conducting its business, and Assignor has no knowledge of any claim that its use of the Intellectual Property has or will violate any rights, or support any claim of infringement or other claims, of any other person or entity. Assignee may, in its sole discretion, pay any amount or do any act which Assignor fails to do or pay as required hereunder or as requested by Assignee to preserve, defend, protect, maintain, record or enforce the Obligations, the Collateral, or the assignment granted hereunder, including without limitation, filing fees, court costs, travel expenses and attorneys' fees. In the event any one or more of the patents listed in *Exhibit A* is or becomes the subject of any litigation, Assignee shall at its option have the sole right to control such litigation, select counsel, determine whether settlement shall be offered or accepted, determine and negotiate all settlement terms and be indemnified by Assignor for all costs of litigation and settlement including, without limitation, all costs, expenses and attorneys' fees. Assignor will be liable to Assignee for any payments under this paragraph which shall be deemed reasonable expenses and will become part of the Obligations secured hereby.

g. No Other Patents; No Pending Applications. As of the date of this Assignment, Assignor has no patents issued by, or the subject of pending applications in, the United States Patent and Trademark Office or any similar office or agency in the United States or any other country, other than those described in *Exhibit A* annexed hereto.

h. No Subsequent Applications. Assignor shall not file any application for the issuance of a patent with the United States Patent and Trademark Office or any similar office or agency in the United States or any other country, unless Assignor has by prior written notice informed Assignee of such action and obtained written consent thereto. Upon request of Assignee, Assignor shall execute and deliver to Assignee any and all assignments, agreements, instruments, documents and such other papers as may be requested by Assignee to effect an assignment of such application to the Assignee.

i. No Abandonment. Assignor has not abandoned any pending patent or trademark application and Assignor will not do any act, nor omit to do any act, whereby the patents or trademarks may become abandoned or unenforceable, unless Assignor, in its business judgment, determines that such abandonment is in the best interest of Assignor. Assignor shall notify Assignee immediately if it knows or has reason to know of any reason why any application, trademark or patent may become abandoned, invalidated or the subject of any suit.

j. Maintenance. Assignor will render any assistance necessary to Assignee without cost to Assignee in any proceeding before the United States Patent and Trademark Office or any similar office or agency in

the United States or any other country to maintain each application and Intellectual Property, including, without limitation, filing of renewals and paying annuities.

k. Notify. Assignor will promptly notify Assignee if Assignor (or any affiliate or subsidiary thereof) becomes aware of any use by any person of any infringement of the Intellectual Property. If requested by Assignee, Assignor, at Assignor's sole cost and expense, shall join with Assignee in such action as Assignee, in Assignee's discretion, may deem advisable for the protection of Assignee's interest in and to the Intellectual Property.

l. Indemnification. Assignor assumes all responsibility and liability arising from the use of Intellectual Property and Assignor hereby indemnifies and holds Assignee harmless from and against any claim, suit, loss, damage or expense (including attorneys' fees) arising out of any alleged defect in any product manufactured, promoted or sold by Assignor (or any affiliate or subsidiary thereof) in connection with any Intellectual Property or out of the manufacture, promotion, labeling, sale or advertisement of any such product by Assignor (or any affiliate or subsidiary thereof).

m. Release. Assignor releases Assignee from all claims, causes of action and demands arising at any time out of or with respect to this Assignment, the Collateral and/or any actions taken or to be taken by Assignee with respect thereto, and Assignor agrees to hold Assignee harmless from and with respect to any all such claims, causes of action and demands.

5. Remedies of Assignee. Upon the occurrence and during the continuance of an Event of Default and in addition to all other rights and remedies of Assignee, including without limitation, such rights and remedies available to Assignee and Lenders under the Credit Agreement and other Credit Documents, whether provided under applicable law or otherwise, Assignee shall have the following rights and remedies which may be exercised without notice to, or consent by, Assignor except as such notice or consent is expressly provided for herein.

a. Stop Use. Assignee may require that neither Assignor nor any Affiliate or Subsidiary of Assignor make any use of the patented inventions subject hereto for any purpose whatsoever.

b. Licenses. Upon ten (10) days' notice to Assignor, Assignee may grant such license or licenses relating to the Collateral for such term or terms, on such conditions, and in such manner, as Assignee shall in its sole discretion deem appropriate. Such license or licenses may be general, special or otherwise, and may be granted on an exclusive or nonexclusive basis throughout the United States of America, its territories and possessions and all foreign countries.

c. Sale. Upon ten (10) days' prior notice to Assignor, Assignee may assign, sell or otherwise dispose of the Collateral or any part thereof, either with or without special conditions or stipulations. Assignee shall have the power to buy the Collateral or any part thereof, and Assignee shall also have the power to execute assurances and perform all other acts which Assignee may, in Assignee's sole discretion, deem appropriate or proper to complete such assignment, sale or disposition.

d. Power of Attorney. In addition to the foregoing, in order to implement the assignment, sale or other disposition of any of the Collateral pursuant to **Subparagraph 5(c)** hereof, Assignee may at any time execute and deliver on behalf of Assignor, pursuant to the authority granted in the Powers of Attorney described in **Subparagraph 4(e)** hereof, one or more instruments of assignment of the Collateral (or application, letters patent or recording relating thereto), in form suitable for filing, recording or registration. Assignor agrees to pay when due all costs incurred in any such transfer of the Collateral, including, but not limited to, any taxes, fees and attorneys' fees.

e. Application of Proceeds: Deficiency. Assignee may first apply the proceeds actually received from any such license, assignment, sale or other disposition of Collateral to the costs and expenses thereof, including, without limitation to, reasonable attorneys' fees and all legal, travel and other expenses which may be incurred by

Assignee. Thereafter, Assignee may apply any remaining proceeds to such of the Obligations provided in the Credit Agreement. Assignor, Borrower and any Guarantors of the Obligations shall remain liable to Assignee for any expenses or Obligations remaining unpaid after the application of such proceeds, and Assignor will pay, or cause Borrower and any Guarantor to pay, Assignee on demand any such unpaid amount, together with interest at the interest rate set forth in the Credit Agreement.

f. Trade Secrets. In the event that any such license, assignment, sale or other disposition of the Collateral (or any part thereof) is made after the occurrence of an Event of Default, Assignor shall supply to Assignee or Assignee's designee, Assignor's knowledge and expertise relating to the manufacture and sale of the products according to the patented inventions, Assignor's customer lists and other records relating to the distribution of said products.

g. Non-Exclusive Remedies. Nothing contained herein shall be construed as requiring Assignee to take any such action at any time. All of Assignee's rights and remedies, whether provided under applicable law, the Credit Agreement, any Credit Document, this Assignment or otherwise shall be cumulative and none is exclusive. Such rights and remedies may be enforced alternatively, successively or concurrently.

6. Miscellaneous.

a. Complete Satisfaction. Upon the payment and performance in full of all the terms and conditions of this Assignment and the Obligations, Assignee will execute a re-assignment of the Intellectual Property listed in *Exhibit A* and deliver that re-assignment to Assignor for filing by Assignor at Assignor's sole cost and expense.

b. No Waiver. Any failure or delay by Assignee to require strict performance by Assignor of any of the provisions, warranties, terms and conditions contained herein or in any other agreement, document or instrument, shall not affect Assignee's right to demand strict compliance and performance therewith, and any waiver of any default shall not waive or affect any other default, whether prior or subsequent thereto, and whether of the same or of a different type. None of the warranties, conditions, provisions, and terms contained herein or in any other agreement, document or instrument shall be deemed to have been waived by any act or knowledge of Assignee, its agents, officers or employees, but only by an instrument in writing, signed by an officer of Assignee and directed to Assignor, specifying such waiver.

c. Notices. Any notice, consent, or other communication required or permitted to be given under this Assignment to Assignor or Assignee must be in writing and delivered in person or by facsimile or by registered or certified mail, return receipt requested, postage prepaid, as follows:

To Assignee: Bank of America, N.A.
Attention: Craig S. Wall
700 Louisiana, 7th Floor
Houston, Texas 77002
Telephone: 713-247-6559
Fax No.: 713-247-7748

with a copy to: Porter & Hedges, L.L.P.
Attention: Mr. Nick H. Sorensen
700 Louisiana, 35th Floor
Houston, Texas 77002
Telephone: (713) 226-0677
Fax No.: (713) 227-7674

To Assignor: Danford Technologies, Inc.
2100-1075 West Georgia St.
Vancouver, B.C. V6E 3G2
Attn: President

with a copy to: Quanta Services, Inc.
1360 Post Oak Blvd., Suite 2100
Houston, Texas 77056
Attention: Mr. James Haddox
Telephone: (713) 629-7600
Fax No.: (713) 629-7676

with a copy to: Quanta Services, Inc.
1360 Post Oak Blvd., Suite 2100
Houston, Texas 77056
Attention: General Counsel
Telephone: (713) 629-7600
Fax No.: (713) 629-7676

Each such notice, request or other communication shall be effective (i) if given by telecopier, when such telecopy is transmitted to the telecopier number specified in this *Section 6.c.* and a confirmation of receipt of such telecopy has been received by the sender, (ii) if given by telex, when such telex is transmitted to the telex number specified in this *Section 6.c.* and the answer back is received by sender, (iii) if given by courier, when delivered, (iv) if given by mail, five (5) days after such communication is deposited in the mail, registered with return receipt requested, addressed as aforesaid or (v) if given by any other means, when delivered at the addresses specified in this *Section 6.c.*

d. Severability; Captions. In the event that any provision hereof shall be deemed to be invalid by any court, such invalidity shall not affect the remainder of this Assignment, which shall be deemed severable. The captions and paragraph headings herein shall not be considered part of the this Assignment.

e. Parties. This Assignment shall be binding upon and for the benefit of the parties hereto and their respective legal representatives, successors and assigns.

f. Governing Law; Submission to Jurisdiction; Waiver of Jury Trial; Arbitration.

(1) This Assignment and the other Credit Documents, and the rights and duties of the parties thereto, shall be construed in accordance with and governed by the internal laws of the State of Texas.

(2) **ASSIGNOR AND ASSIGNEE EACH HEREBY WAIVES ITS RIGHT TO RESOLVE DISPUTES, CLAIMS, AND CONTROVERSIES ARISING FROM THIS ASSIGNMENT, ANY OTHER CREDIT DOCUMENT OR ANY MATTER IN CONNECTION THEREWITH, INCLUDING, WITHOUT LIMITATION, CONTRACT DISPUTES AND TORT CLAIMS, THROUGH ANY COURT PROCEEDING OR LITIGATION AND ACKNOWLEDGES THAT ALL SUCH DISPUTES, CLAIMS AND CONTROVERSIES SHALL BE RESOLVED PURSUANT TO THIS SECTION, EXCEPT THAT EQUITABLE RELIEF AND CERTAIN OTHER RIGHTS AND REMEDIES SET FORTH BELOW MAY BE SOUGHT FROM ANY COURT OF COMPETENT JURISDICTION. ASSIGNOR REPRESENTS TO ASSIGNEE AND ASSIGNEE REPRESENTS TO ASSIGNOR THAT THIS WAIVER IS MADE KNOWINGLY AND VOLUNTARILY AFTER CONSULTATION WITH AND UPON ADVICE OF ITS COUNSEL AND IS A MATERIAL PART OF THIS ASSIGNMENT. ALL SUCH DISPUTES, CLAIMS AND CONTROVERSIES SHALL BE RESOLVED BY BINDING ARBITRATION PURSUANT TO THE COMMERCIAL RULES OF THE AMERICAN ARBITRATION ASSOCIATION ("AAA").** Any arbitration proceeding held pursuant to this

arbitration provision shall be conducted in Houston, Texas or at any other place selected by mutual agreement of Assignor and Assignee. No act to take or dispose of any collateral shall constitute a waiver of this arbitration agreement or be prohibited by this arbitration agreement. This arbitration provision shall not limit the right of either party during any dispute, claim or controversy to seek, use, and employ ancillary, or preliminary rights and/or remedies, judicial or otherwise, for the purposes of realizing upon, preserving, protecting, foreclosing upon or proceeding under forcible entry and detainer for possession of, any real or personal property, and any such action shall not be deemed an election of remedies. Such remedies include, without limitation, obtaining injunctive relief or a temporary restraining order, invoking a power of sale under any deed of trust or mortgage, obtaining a writ of attachment or imposition of a receivership, or exercising any rights relating to personal property, including exercising the right of set-off, or taking or disposing of such property with or without judicial process pursuant to the Uniform Commercial Code. Any disputes, claims or controversies concerning the lawfulness or reasonableness of an act, or exercise of any right or remedy concerning any collateral, including any claim to rescind, reform, or otherwise modify any agreement relating to the collateral, shall also be arbitrated; provided, however that no arbitrator shall have the right or the power to enjoin or restrain any act of either party. Judgment upon any award rendered by any arbitrator may be entered in any court having jurisdiction. The statute of limitations, estoppel, waiver, laches and similar doctrines which would otherwise be applicable in an action brought by a party shall be applicable in any arbitration proceeding, and the commencement of an arbitration proceeding shall be deemed the commencement of any action for these purposes. The federal arbitration act (Title 9 of the United States Code) shall apply to the construction, interpretation, and enforcement of this arbitration provision.

(3) To the fullest extent permitted by applicable law, each party hereto agrees that any court proceeding or litigation permitted by *Subparagraph 6(f)(2)* may be brought and maintained in the courts of the State of Texas sitting in Harris County or the United States District Court for the Southern District of Texas. To the fullest extent permitted by applicable law, Pledgor hereby expressly and irrevocably submits to the jurisdiction of the courts of the State of Texas and the United States District Court for the Southern District of Texas for the purpose of any such litigation as set forth above and irrevocably agrees to be bound by any judgment rendered thereby in connection with such litigation. To the fullest extent permitted by applicable law, Assignor further irrevocably consents to the service of process, by registered mail, postage prepaid, or by personal service within or without the state of Texas. To the fullest extent permitted by applicable law, Assignor hereby expressly and irrevocably waives any objection which it may have or hereafter may have to the laying of venue of any such litigation brought in any such court referred to above and any claim that any such litigation has been brought in an inconvenient forum. To the extent that Assignor has or hereafter may acquire any immunity from jurisdiction of any court or from any legal process (whether through service of notice, attachment prior to judgment, attachment in aid of execution or otherwise) with respect to itself or its property, Assignor hereby irrevocably waives to the fullest extent permitted by applicable law, such immunity in respect of its Obligations under this Assignment and the other Credit Documents.

(4) **TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EACH PARTY HERETO VOLUNTARILY, KNOWINGLY, IRREVOCABLY AND UNCONDITIONALLY (BY THEIR ACCEPTANCE HEREOF) WAIVES ANY RIGHT TO A TRIAL BY JURY IN ANY ACTION OR PROCEEDING PERMITTED BY SUBSECTION 6(F)(2) AND WAIVES ANY RIGHT TO HAVE A JURY PARTICIPATE IN RESOLVING ANY DISPUTE (WHETHER BASED ON CONTRACT, TORT OR OTHERWISE) ARISING OUT OF THIS AGREEMENT, ANY OTHER CREDIT DOCUMENT, ANY OTHER RELATED DOCUMENT OR ANY RELATIONSHIP BETWEEN EACH LENDER, BORROWER AND/OR ANY GUARANTOR, AND AGREES THAT ANY SUCH ACTION, PROCEEDING OR DISPUTE SHALL BE TRIED BEFORE A COURT AND NOT BEFORE A JURY. THIS PROVISION IS A MATERIAL INDUCEMENT TO EACH LENDER TO PROVIDE THE LOANS AND THE LETTERS OF CREDIT UNDER THE CREDIT AGREEMENT.**

g. No Marshaling. Notwithstanding the existence of any other security interests held by Assignee or by any other party, Assignee shall have the right to determine the order in which any or all of the Collateral shall be subjected to the remedies provided herein. Assignee shall have the right to determine the order in which any

or all portions of the Obligations are satisfied from the proceeds realized upon the exercise of the remedies provided herein. Assignor, any party who becomes liable for Assignor's obligations and covenants under this Assignment, and any party who now or hereafter acquires a security interest in the Collateral, or any portion thereof, hereby waives any and all right to require the marshaling of assets in connection with the exercise of any of the remedies permitted by applicable law or provided herein.

h. Survival of Representations and Warranties. All representations and warranties made in this Assignment or in any certificate delivered pursuant hereto shall survive the execution and delivery of this Assignment, and no investigation by Assignee shall affect the representations and warranties or the right of Assignee to rely upon them.

i. Counterparts. This Assignment may be executed in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

j. Construction. Assignor and Assignee acknowledge that each of them has had the benefit of legal counsel of its own choice and has been afforded an opportunity to review this Assignment with its legal counsel and that this Assignment shall be construed as if jointly drafted by Assignor and Assignee.

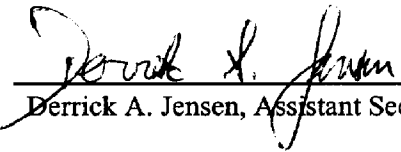
k. **AMENDMENT; ENTIRE AGREEMENT.** THIS ASSIGNMENT, TOGETHER WITH THE OTHER CREDIT DOCUMENTS, EMBODIES THE FINAL, ENTIRE AGREEMENT AMONG THE PARTIES HERETO AND SUPERSEDES ANY AND ALL PRIOR COMMITMENTS, AGREEMENTS, REPRESENTATIONS, AND UNDERSTANDINGS, WHETHER WRITTEN OR ORAL, RELATING TO THE SUBJECT MATTER HEREOF. THE PROVISIONS OF THIS ASSIGNMENT MAY BE AMENDED OR WAIVED ONLY BY AN INSTRUMENT IN WRITING SIGNED BY THE PARTIES HERETO.

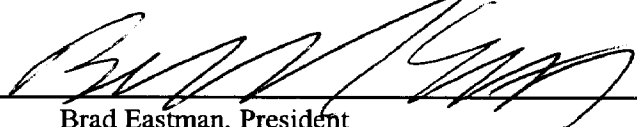
[Signatures appear on the following page]

IN WITNESS WHEREOF, the parties hereto have duly executed this Assignment as the date first written above.

ASSIGNOR:

DANFORD TECHNOLOGIES, INC.

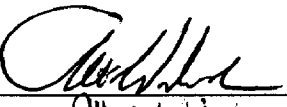
Attest: 
Derrick A. Jensen, Assistant Secretary

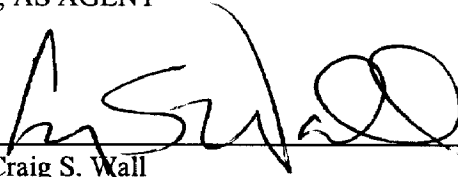
By: 
Brad Eastman, President

WITNESS:

ASSIGNEE:

NATIONSBANK, N.A. D/B/A BANK OF AMERICA,
N.A., AS AGENT


Name: Albert Weid
Title: Senior Vice President

By: 
Craig S. Wall
Senior Vice President

Attachments:

- Exhibit A - Patent Information
- Exhibit A-1 Copy of Patent
- Exhibit B - Special Power of Attorney

EXHIBIT A

INTELLECTUAL PROPERTY

The following patents and patent applications owned by Danford Technologies, Inc.:

TITLE	COUNTRY	PATENT NO. AND DATE	APPLICATION NO. AND DATE	STATUS
Boom-Mountable Robotic Arm	United States	5,538,207 July 23, 1996	370,368 January 9, 1995	Granted

See attached Exhibit A-1 for additional details.

EXHIBIT B

SPECIAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that Danford Technologies, Inc., a corporation organized under the laws of British Columbia, Canada ("*Assignor*"), hereby appoints and constitutes NationsBank, N.A. d/b/a Bank of America, N.A., as Agent, for the ratable benefit of the Lenders ("*Assignee*"), and each officer thereof, its true and lawful attorney, with full power of substitution and with full power of authority to perform the following actions on behalf of Assignor upon the occurrence and continuance of an Event of Default, as such term is defined in the Assignment:

1. Execution and delivery of any and all agreements, documents, instruments of assignment, or other papers which Assignee, pursuant to its exercise of rights as provided in the Patent Collateral Assignment, deems necessary or advisable for the purpose of assigning, selling or otherwise disposing of all right, title and interest of Assignor in and to any patents, together with any reissues, extensions, renewals, continuation, continuation-in-part and divisions thereof, and in order to preserve, defend, protect, maintain or accomplish any other formality with respect to the foregoing.
2. Execution and delivery of any and all documents, statements, certificates or other papers which Assignee, pursuant to its exercise of rights as provided in the Patent Collateral Assignment, deems necessary or advisable to further the purposes described in *Section 1* above.

This Special Power of Attorney is made pursuant to a Patent Collateral Assignment between Assignor and Assignee dated as of June 14, 1999, and may not be revoked until the payment and performance in full of all Obligations, as such term is defined in the Assignment, and the termination of all Commitments under and as defined in the Credit Agreement (which is defined in the Patent Collateral Assignment).

ASSIGNOR:

DANFORD TECHNOLOGIES, INC.

Attest: _____
Derrick A. Jensen, Assistant Secretary

By: _____
Brad Eastman, President

STATE OF TEXAS

COUNTY OF HARRIS

Personally appeared before me, a Notary Public in and for the State of Texas, Brad Eastman, President of Danford Technologies, Inc. who acknowledged the foregoing as the true act and deed of said corporation this 14th day of June, 1999.

Notary Public

US005538207A

United States Patent [19]
O'Connell et al.

[11] Patent Number: 5,538,207
[45] Date of Patent: Jul 23, 1996

[54] BOOM-MOUNTABLE ROBOTIC ARM

[75] Inventors: Daniel N. O'Connell; Clifford W. Devine, both of Oliver, Canada
[73] Assignee: Danford Technologies Inc., Oliver, Canada

[21] Appl. No.: 370,368

[22] Filed: Jan. 9, 1995

[30] Foreign Application Priority Data

Oct. 28, 1994 [CA] Canada 2134617

[51] Int. Cl.^o F16L 3/00

[52] U.S. Cl. 248/49: 182/2

[58] Field of Search 248/49, 58, 351,
248/544: 52/127.1, 127.2; 182/2

[56] References Cited

U.S. PATENT DOCUMENTS

1,501,590	7/1924	Floyd	
2,502,815	4/1950	Beebe	254/139
3,204,309	9/1965	Ricker	24/81
3,271,009	9/1966	Wright et al.	254/134.3
3,381,711	5/1968	Fye et al.	137/615
3,540,111	11/1970	Wainwright	29/401
4,421,301	12/1983	Chapman	254/134.3
4,466,506	8/1984	Dolenti	182/2
4,721,213	1/1988	Eitel	182/2 X
4,973,795	11/1990	Sharpe	174/40
5,056,673	10/1991	Williams	212/179

FOREIGN PATENT DOCUMENTS

1352827 5/1964 France

197299 8/1989 Japan

OTHER PUBLICATIONS

A.B. Change Company Catalog Bulletin 7B-13, Feb. 1980.
A.B. Change Company Supplemental Catalog Bulletin 7B-28.1 & 28.2, Oct., 1987.
Hastings Fiber Glass Products Inc. Product Catalog, 1985.

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[57] ABSTRACT

A telescoping robotic arm for temporarily supporting energized power lines to enable repair or replacement of transmission poles, crossarms, insulators and the like. The robotic arm is connectible to the boom of a service vehicle and is operable by remote control. The arm includes a boom adaptor sleeve for receiving the upper end of the boom, a frame pivotably coupled to the boom adaptor, and at least one telescoping arm coupled to the frame and adjustable between a retracted position and an extended position coaxial with the frame. An insulator stack and conductor holder are mounted on each of the telescoping arm(s) and the frame for releasably engaging a corresponding energized conductor. The angular position of the frame relative to the boom adaptor is adjustable to permit levelling of the robotic arm irrespective of the boom angle. In one embodiment of the invention, the robotic arm is capable of engaging and supporting both transmission lines supported at the upper end of a transmission tower or pole and distribution lines supported by a lower crossarm directly underneath the transmission lines.

35 Claims, 16 Drawing Sheets

