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Form PTO-1595 RE
(Rev. 03/01)
OMB No. 0651-0027 (exp. 5/31/2002)
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U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office

To the Honorable Commissioner of I ... original documents or copy thereof.

1. Name of conveying party(ies):

Haleos, Inc.

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

2. Name and address of receiving party(ies)

Name: Shipley Company, L.L.C.

Internal Address: _____

Street Address: 455 Forest Street

City: Marlborough State: MA Zip: 01752

Additional name(s) & address(es) attached? ☐ Yes ☑ No

3. Nature of conveyance:

☑ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Other _____

Execution Date: 9/11/02

4. Application number(s) or patent number(s):

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) See attached schedule

Additional numbers attached? ☑ Yes ☐ No

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

Name: Darryl P. Frickey, Esq.

Internal Address: Shipley Company, L.L.C

Street Address: 455 Forest Street

City: Marlborough State: MA Zip: 01752

6. Total number of applications and patents involved: ☐

7. Total fee (37 CFR 3.41).....$ 4,725.00

☑ Enclosed

☑ Authorized to be charged to deposit account

8. Deposit account number:

141449

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10/16/2002 DBYRNE 00000275 09824205
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9. Signature.

Repln. Rec: 10/16/2002 DBYRNE 0011441000
DA#:141449 Name Number: 09824205
FC: 704 15.00 CR

Darryl D Sanft — 10/11/02

Name of Person Signing — Signature — Date

Total number of pages including cover sheet, attachments, and documents: ☐

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

SCHEDULE A

INTELLECTUAL PROPERTY

PATENTS

Habanero Docket	Country	Serial No.	Title	Publication No.
123	US	09/824205	OPTOELECTRONIC PACKAGES HAVING INSULATION LAYERS	20010036344
119	US	09/824638	TWO-DIMENSIONAL ARRAY FOR ROTATIONAL ALIGNMENT OF POLARIZATION MAINTAINING OPTICAL FIBER	20010055460
/	US	09/825990	SINGLE-PIECE ALIGNMENT FRAME FOR OPTICAL FIBER ARRAYS	20020021881
121	US	09/827183	METHOD AND DEVICES FOR COUPLING OPTOELECTRONIC PACKAGES	20010031117
148	US	09/828842	OPTICAL SWITCH AND METHOD FOR MAKING	
124	US	09/833282	FIBER OPTIC ARRAY SWITCH	20010048785
126, 127	US	09/835106	OPTICAL WAVEGUIDE SWITCH	20010041026
125	US	09/835863	CONNECTOR STRUCTURE FOR INTEGRATED OPTIC WAVEGUIDE DEVICES	20010041029
128	US	09/845773	OPTICAL WAVEGUIDE SWITCH	20020025104
129	US	09/847798	SINGLE MASK TECHNIQUE FOR MAKING POSITIVE AND NEGATIVE MICROMACHINED	20010050266
131	US	09/851376	OPTICAL WAVEGUIDE FERRULE AND METHOD OF MAKING AN OPTICAL WAVEGUIDE	20010055449
201, 149-P	US	09/852709	OPTICAL SWITCH ASSEMBLY AND METHOD FOR MAKING	20020025107
130	US	09/853250	MULTI-LEVEL LITHOGRAPHY MASKS	20020031711
132	US	09/858999	MULTI-LEVEL OPTICAL STRUCTURE AND METHOD OF MANUFACTURE	
133	US	09/860825	OPTICAL WAVEGUIDE DEVICES AND METHODS OF FABRICATING THE SAME	20020028037
134	US	09/862037	METHOD OF FABRICATING OPTICAL FILTERS	20020012172
135	US	09/862593	METHOD FOR MAKING INTEGRATED OPTICAL WAVEGUIDES AND MICROMACHINED FEATURES	20020005050
140-P	US	09/878486	METHOD FOR CLEAVING INTEGRATED OPTIC WAVEGUIDES TO PROVIDE A SMOOTH WAVEGUIDE ENDFACE	20020001435
152-P	US	09/878810	OPTICAL FIBER FERRULE MADE FROM DRY ETCHED PARTS	20010051026
138	US	09/884428	TWO-DIMENSIONAL FIBER ARRAY AND METHOD OF MANUFACTURE	
216	US	09/884873	METHOD OF FABRICATING AN OPTICAL FIBER ARRAY USING PHOTOSENSITIVE	
142	US	09/903077	FRONTSIDE/BACKSIDE ALIGNMENT STRUCTURES FOR STACKED DEVICES	

SCHEDULE A

INTELLECTUAL PROPERTY

PATENTS

Habanero Docket	Country	Serial No.	Title	Publication No.
136	US	09/911834	METHOD FOR MAKING 3-D STRUCTURES BY ETCHING MASK WITH GRADED COMPOSITION	
230	US	09/923842	ALIGNMENT APPARATUS AND METHOD FOR ALIGNING STACKED DEVICES	
215/146	US	09/930566	MICROLENSES AND METHOD OF FABRICATION	
150	US	09/957755	FIBER ARRAY WITH SUPPORT POST	
162	US	09/966973	OPTICAL DEVICE PACKAGE	
151	US	09/974745	METHOD FOR PATTERNED DEPOSITION OF CONFORMAL COATINGS	
153	US	09/978804	FILLED TRENCH/PLANARIZATION METHOD FOR MAKING OPTICAL WAVEGUIDES	
178	US	09/981944	2-D FIBER ARRAYS WITH ROTATED FIBERS FOR ACCURATE CORE POSITIONING	
165/157	US	09/983984	VARIABLE WIDTH WAVEGUIDE FOR MODE-MATCHING AND METHOD FOR MAKING	
155	US	09/985377	METHOD FOR FORMING OPTICAL DEVICES AND OPTICAL DEVICES FORMED THEREBY	
159	US	09/987139	SEMICONDUCTOR MODULE WITH SUBMOUNT HAVING TRANSMISSION LINE AND METHOD FOR FORMING	
163	US	09/987766	OPTICAL ASSEMBLY COUPLING WITH INTEGRATED OPTICAL DEVICES AND METHOD FOR MAKING	
161	US	09/988055	OPTICAL BENCH WITH ALIGNMENT SUBASSEMBLY	
		09/990509		
144	US	09/999332	SINGLE MASK PROCESS FOR PATTERNING GRAY SCALE FEATURES AND MICROMACHINED FEATURES	
158	US	09/999517	WAFER-LEVEL PACKAGING FOR OPTOELECTRONIC DEVICES	
173	US	10/013084	OPTOELECTRONIC PACKAING WITH STEPPED VIA-STRUCTURE	
174	US	10/013793	STRUCTURE FOR FRONTSIDE/BACKSIDE ALIGNMENT OF MICROMACHINED CHIPS	
174B	US	10/015211	STRUCTURE FOR FRONTSIDE/BACKSIDE ALIGNMENT OF MICROMACHINED CHIPS	
176	US	10/022726	FTIR/TIR SWITCH IMPROVEMENTS	
141	US	10/037971	FIBER ARRAY WITH V-GROOVE CHIP AND MOUNT	
		10/041517		

SCHEDULE A

INTELLECTUAL PROPERTY

PATENTS

Habanero Docket	Country	Serial No.	Title	Publication No.
164	US	10/054575	OPTICAL CONNECTOR SYSTEM	
180	US	10/066299	OPTICAL PACKAGE HAVING A VERTICAL OPTOELECTRONIC CHIP	
181	US	10/071,261	MICROMACHINING WITH BOTH DRY AND WET ITCHING	
177	US	10/071871	METHOD FOR PASSIVELY LOCATING A FIBER STUB IN A GROOVE	
183/184	US	10/076568	STRUCTURES MADE BY COMBINED ETCHING	
179	US	10/081995	METHOD FOR MAKING A VERTICAL TAPERED WAVEGUIDE WITH A MOVING MASK	
193	US	10/113817	OPTICAL FIBERS FOR COUPLING TO DIFFUSED WAVEGUIDES	
195	US	10/124612	WET + DRY ETCHING PROCESS ON <10> SILICON AND RESULTING STRUCTURES	
202	US	10/126491	SOLDER PADS AND METHOD OF MAKING A SOLDER PAD	
203	US	10/126938	OPTICAL FIBER ATTACHED TO A SUBSTRATE	
206	US	10/135192	VENTING OPTICAL MICROBENCH	
126,127	US	60/201347	OPTICAL WAVEGUIDE SWITCH	
152-P	US	60/235391	OPTICAL FIBER FERRULE MADE FROM DRY ETCHED PARTS	
156	US	60/243451	FILLED TRENCH/PLANARIZATION METHOD FOR MAKING OPTICAL COUPLERS	
147	US	60/245077	AUTOMATED PALLETIZED ASSEMBLY FOR MICROOPTICAL DEVICES	
170	US	60/255867	CONNECTORIZED SILICON OPTOELECTRONIC PACKAGE	
214	US	60/266931	V-GROOVE WITH TAPERED DEPTH	
182	US	60/267368	2-D WAVEGUIDE ARRAY HAVING ETCHED FRAME	
186	US	60/270467	CENTRIFUGAL METHOD OF MAKING ASPHERIC LENSLETS	
185	US	60/271529	RECESSED STRUCTURES MADE BY COMBINED ETCHING	
189	US	60/275736	METHOD OF MAKING A WAVEGUIDE IN SILICON BY THERMAL OXIDATION	
188	US	60/275744	FIBER ARRAY HAVING BUCKLING FIBERS FOR AXIAL COMPRESSIBILITY	
191	US	60/276741	WAFER-LEVEL ASSEMBLY OF OPTOELECTRONIC CONNECTOR	
192	US	60/276742	MT-STYLE FERRULE HAVING INTEGRAL HEATSINK FOR OPTOELECTRONIC MODULE	
190	US	60/276743	MICROBELLOWS POSITIONING STAGE	

SCHEDULE A

INTELLECTUAL PROPERTY

PATENTS

Habanero Docket	Country	Serial No.	Title	Publication No.
194	US	60/280573	SUBMOUNT FOR VCSEL CONNECTOR	
197	US	60/283803	OPTICAL SUBMOUNT WITH CYLINDRICAL LENS	
204	US	60/286190	TUNABLE ETALON	
209	US	60/292651	WICK-STOP FIBER OPTIC ARRAY SUBSTRATE	
210	US	60/293634	SELF-ALIGNING FIBER OPTIC ARRAY	
200	US	60/294867	MICROMACHINED ETALON	
196	US	60/294869	MAGNETOHYDRODYNAMIC OPTICAL SWITCH	
199	US	60/295175	DISCRETE-WAVELENGTH TUNABLE LASER	
198	US	60/295556	SHADOW MASK FOR NONPLANAR SUBSTRATES	
212	US	60/299241	MICRO-OPTICAL BENCH WITH TRANSVERSE PIN FOR DEVICE LOCATION	
211	US	60/299890	WAVEGUIDE FABRICATION METHOD AND RESULTING WAVEGUIDE	
217	US	60/300166	FIBER ARRAY HAVING FLEXIBLE LEAF SPRINGS	
213	US	60/300201	VERTICAL REFLECTOR TYPE OPTICAL SUBMOUNT MADE BY COMBINED WET + DRY ETECHING	
228	US	60/300964	GUILOTINE FOR FIBER OPTICS	
218	US	60/301341	PASSIVE ALIGNMENT FOR STACKED MICROMACHINED CHIPS	
229	US	60/304927	2XN FIBER ARRAY WITH PASSIVE ALIGNMENT	
		60/306568		
222	US	60/309751	OPTICAL SUBMOUNT WITH RETAINING SPRING	
223	US	60/310378	WAFER-LEVEL TESTING OF SILICON OPTICAL BENCH DEVICES	
224	US	60/318189	FIBER ARRAY HAVING FIBERS BONDED TO SUBSTRATE WITH SOLDER GLASS	
231	US	60/325043	2-D FIBER OPTIC ARRAY WITH CROSS-FIBERS FOR ALIGNMENT	
220	US	60/327397	V-GROOVE WITH FIDUCIAL FOR A FIBER STOP	
221	US	60/327397	MULTIPLE-POSITION PASSIVE ALIGNMENT OF PRECISION MECHANICAL DEVICES	
225	US	60/336933	TAPERED WAVEGUIDE FOR COUPLING BETWEEN CHANNEL WAVEGUIDE AND RIB WAVEGUIDE	
232	US	60/337007	RIGHT ANGLE FIBER OPTIC CONNECTOR	
	WO	99US1673	OPTOELECTRONIC MODULE AND METHOD OF MAKING SAME	200031771
172	WO	US01/48383	OPTICAL WAVEGUIDE TERMINATION WITH VERTICAL AND HORIZONTAL MODE SHAPING	

Schedule A		
Intellectual Property **Patents**		
Country U.S.		
Title	**Serial Number**	**Filing Date**
Fiber Array with Passive Alignment	10/194,954	7/11/02
Etching Process for Micromachining Crystalline Materials and Devices Fabricated Thereby	10/199,476	7/19/02
Etching Process for Micromachining Crystalline Materials and Devices Fabricated Thereby	PCT/US02/23177	7/19/02
Silicon Optical Microbench Device and Wafer-Level Testing Thereof	10/214,433	8/6/02
Optical Submount with Retaining Spring and Method for Fabrication Thereof	10/211,951	8/2/02
Method for Molding A Shaped Optical Fiber Tip	09/681,969	7/2/01
Fiber Array Switch Having Micomachined Front Face with Roller Balls	09/728,895	12/1/00
Method for Making Fiber Array Having Protruding Optical Fibers and Resulting Fiber Array	09/814,128	3/22/01
Micromachined, Etalaon-Based Optical Fiber Pressure Sensor	09/814,526	3/22/01
V-Groove Chip with Wick-Stop Trench for Improved Fiber Positioning	09/526,922	3/16/00
Fiber Array with Wick Stop For Improved Fiber Positioning	09/742,179	12/20/00

Schedule A		
Intellectual Property **Patents**		
Country U.S.		
Title	**Serial Number**	**Filing Date**
Optical Device Package for Flip-Chip Mounting	10/013,984	12/10/01
Fiber Optic Pressure Sensor	09/814,526	3/22/01
Inductive Magnetic Recording head having inclined magnetic read/write poleand method of making same	09/560,418	4/27/00
Single mask lithographic process for patterning multiple types of surface features	09/519,165	3/6/00
Optical Array for Preventing Flow of Glue Between Fibers and Waveguide	09/713,117	11/15/00
2-Dimensional Optional Fiber Array Made from etched sticks having notches	09/615,101	7/13/00
Optoelectronic device – optical fiber connector having micromachined pit for passive alignment of the optoelectronic device	09/574,482	5/19/00
Glass Bonded Fiber Array and Method for the Fabrication Thereof	newly filed/not assigned PCT/US02/28765	9/9/02

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ADDENDUM TO SCHEDULE A

And all other patent applications and foreign counterparts (if any) and any continuations, continuations-in-part, modifications, revisions, divisions, reissues, extensions and renewals thereto and all processes, apparatus, and components for which the manufacture, sale or use is covered by or based on the foregoing.

1143126.1

MASTER ASSIGNMENT

For valuable consideration, the receipt of which is hereby acknowledged, Haleos, Inc., a Virginia corporation, with its principal place of business at 3150 State Street, Blacksburg, Virginia ("Haleos"), hereby assigns and transfers to Shipley Company, L.L.C., a Delaware limited liability company, with its principal place of business at 455 Forest Street, Marlborough, Massachusetts and its successors and assigns (collectively hereinafter called the "Assignee"), its entire right, title and interest in the United States and throughout the world in and to: (i) the inventions and improvements which are the subject of the Letters Patents and Patent Applications set forth on Schedule A and Addendum to Schedule A attached hereto (the "Patents"); (ii) any and all instruments of assignment and/or other instruments pursuant to which Haleos became vested with ownership of the Patents, together with any and all rights and improvements acquired pursuant to the terms of said instruments; (iii) the instruments, patents and patent applications and any corresponding foreign patents and foreign patent applications based in whole or in part on any and all inventions claimed by the Patents; (iv) any and all divisions, continuations, reissues, extensions or other applications based on the Patents, together with Haleos' entire rights under the Paris Convention; and (v) any and all United States and foreign patents, utility models, and design registrations granted on the Patents; the same to be held and enjoyed by the Assignee for its own use and enjoyment and that of its successors, assigns, and other legal representatives, to the end of the term or terms for which said patents (including without limitation the "Patents") are or may be granted or reissued as fully and entirely as the same would have been held and enjoyed by Haleos if this assignment had not been made, together with all its claims for damages by reason for past or future infringement of said patents, with the right to sue for and collect the same for its own use and enjoyment, and for use and enjoyment of its successors, assigns, or other legal representatives.

IN WITNESS WHEREOF, the undersigned has executed this Assignment on this 11 day of September, 2002.

Haleos, Inc.
(f/k/a ACT MicroDevices, Inc.)

By: _____
Name: David W Sherrer
Title: President

Commonwealth of Virginia)
) SS.
COUNTY of Montgomery)

On this 11th day of September, 2002, David W. Sherrer appeared before me, known to me to be the person who executed the foregoing instrument, and acknowledged that the foregoing instrument is his/her free act and deed on behalf of Haleos, Inc., with authority so to do.

NOTARIAL SEAL

_____
Notary Public
My Commission Expires: Dec 31, 2005