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PTO/SB/05 (04-05)

Approved for use through 07/31/2006. OMB 0651-0032

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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 CFR 1.53(b))</small>	Attorney Docket No.	ZE068US
	First Inventor	Kia Silverbrook
	Title	Modular Printhead Assembly With A Carrier Of A Metal Alloy
	Express Mail Label No.	

<p style="text-align: center;">APPLICATION ELEMENTS</p> <p style="text-align: center;"><small>See MPEP chapter 600 concerning utility patent application contents.</small></p> <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Fee Transmittal Form (e.g., PTO/SB/17) <small>(Submit an original and a duplicate for fee processing)</small> 2. <input type="checkbox"/> Applicant claims small entity status. <small>See 37 CFR 1.27.</small> 3. <input checked="" type="checkbox"/> Specification [Total Pages <u>20</u>] <small>Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a))</small> 4. <input checked="" type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets <u>19</u>] 5. Oath or Declaration [Total Sheets <u>1</u>] <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> A copy from a prior application (37 CFR 1.63(d)) <small>(for continuation/divisional with Box 18 completed)</small> <ol style="list-style-type: none"> i. <input type="checkbox"/> DELETION OF INVENTOR(S) <small>Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).</small> 6. <input checked="" type="checkbox"/> Application Data Sheet. See 37 CFR 1.76 7. <input type="checkbox"/> CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) <input type="checkbox"/> Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission <small>(if applicable, items a. - c. are required)</small> <ol style="list-style-type: none"> a. <input type="checkbox"/> Computer Readable Form (CRF) b. <input type="checkbox"/> Specification Sequence Listing on: <ol style="list-style-type: none"> i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or ii. <input type="checkbox"/> Paper c. <input type="checkbox"/> Statements verifying identity of above copies 	<p style="text-align: center;">ACCOMPANYING APPLICATION PARTS</p> <ol style="list-style-type: none"> 9. <input checked="" type="checkbox"/> Assignment Papers (cover sheet & document(s)) Name of Assignee <u>Silverbrook Research Pty Ltd</u> 10. <input type="checkbox"/> 37 CFR 3.73(b) Statement <input type="checkbox"/> Power of Attorney <small>(when there is an assignee)</small> 11. <input type="checkbox"/> English Translation Document (if applicable) 12. <input checked="" type="checkbox"/> Information Disclosure Statement (PTO/SB/08 or PTO-1449) <input type="checkbox"/> Copies of citations attached 13. <input type="checkbox"/> Preliminary Amendment 14. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <small>(Should be specifically itemized)</small> 15. <input type="checkbox"/> Certified Copy of Priority Document(s) <small>(if foreign priority is claimed)</small> 16. <input type="checkbox"/> Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). <small>Applicant must attach form PTO/SB/35 or equivalent.</small> 17. <input type="checkbox"/> Other: _____
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18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

Continuation Divisional Continuation-in-part (CIP) of prior application No. See attached Application Data Sheet

Prior application information: Examiner Juanita Stephens Art Unit: 2853

19. CORRESPONDENCE ADDRESS

The address associated with Customer Number: 24011 OR Correspondence address below

Name					KIA SILVERBROOK						
Address					393 Darling Street						
City		State		Zip Code		City		Zip Code			
Balmain		NSW		2041		2041		2041			
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Australia			+61-2-9818 6633			info@silverbrookresearch.com					

Signature		Date	April 24, 2006
Name (Print/Type)	Kia Silverbrook, Tobin Allen King	Registration No.	
		(Attorney/Agent)	

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL For FY 2005

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT		(\$)		1,080.00	
Application Number		Complete if Known			
Filing Date					
First Named Inventor		Kia Silverbrook			
Examiner Name					
Art Unit					
Attorney Docket No.		ZE068US			

METHOD OF PAYMENT (check all that apply)

Check Credit Card Money Order None Other (please identify): _____

Deposit Account Deposit Account Number: _____ Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	1000
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims 9 - 20 or HP = _____ x _____ = _____ **Fee Paid (\$)** _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims 1 - 3 or HP = _____ x _____ = _____ **Fee Paid (\$)** _____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
39	100	1	250	

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount) **Fees Paid (\$)** _____

Other (e.g., late filing surcharge): Recording each patent assignment per property (X 2) **Fees Paid (\$)** 80.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	Telephone +61-2-9818 6633
Name (Print/Type)	Kia Silverbrook; Tobin Allen King		Date April 24, 2006

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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MODULAR PRINTHEAD ASSEMBLY WITH A CARRIER OF A METAL ALLOY

CROSS REFERENCE TO RELATED APPLICATION

5 This is a Continuation Application of USSN 11/250,450 filed on October 17, 2005, which is a Continuation Application of USSN 10/728,922 filed December 8, 2003, now US patent No. 6,997,545 which is a Continuation Application of USSN 10/102,700 filed on March 22 2002, now US patent No. 6,692,113 all of which is herein incorporated by reference.

10

CO-PENDING APPLICATIONS

Various methods, systems and apparatus relating to the present invention are disclosed in the following co-pending applications filed by the applicant or assignee of the present invention: 09/575,141 (6,428,133); 09/575,125 (6,526,658), 09/575,108
15 (6,795,215), 09/575,109.

The disclosures of these co-pending applications are incorporated herein by reference.

BACKGROUND OF THE INVENTION

20 The following invention relates to a printhead module assembly for a printer.

More particularly, though not exclusively, the invention relates to a printhead module assembly for an A4 pagewidth drop on demand printer capable of printing up to 1600 dpi photographic quality at up to 160 pages per minute.

The overall design of a printer in which the printhead module assembly can be
25 utilized revolves around the use of replaceable printhead modules in an array approximately 8½ inches (21 cm) long. An advantage of such a system is the ability to easily remove and replace any defective modules in a printhead array. This would eliminate having to scrap an entire printhead if only one chip is defective.

A printhead module in such a printer can be comprised of a "Memjet" chip, being a
30 chip having mounted thereon a vast number of thermo-actuators in micro-mechanics and micro-electromechanical systems (MEMS). Such actuators might be those as disclosed in U.S. Patent No. 6,044,646 to the present applicant, however, might be other MEMS print chips.

ZE068US

In a typical embodiment, eleven "Memjet" tiles can butt together in a metal channel to form a complete 8½ inch printhead assembly.

The printhead, being the environment within which the printhead module assemblies of the present invention are to be situated, might typically have six ink chambers and be capable of printing four color process (CMYK) as well as infrared ink and fixative. An air pump would supply filtered air through a seventh chamber to the printhead, which could be used to keep foreign particles away from its ink nozzles.

Each printhead module receives ink via an elastomeric extrusion that transfers the ink. Typically, the printhead assembly is suitable for printing A4 paper without the need for scanning movement of the printhead across the paper width.

The printheads themselves are modular, so printhead arrays can be configured to form printheads of arbitrary width.

Additionally, a second printhead assembly can be mounted on the opposite side of a paper feed path to enable double-sided high-speed printing.

15 OBJECTS OF THE INVENTION

It is an object of the present invention to provide an improved printhead module assembly.

It is another object of the invention to provide a printhead assembly having improved modules therein.

20 SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided a printhead assembly which comprises

an elongate channel member having a floor and a pair of opposed side walls, the elongate channel member being of a metal having thermal expansion properties that are similar to thermal expansion properties of silicon; and

at least one printhead module positioned in the support structure, along a length of the support structure, the, or each, printhead module comprising

an elongate ink supply assembly that is positioned in the channel, the ink supply assembly being configured to receive a supply of ink and to provide a plurality of ink flow paths interposed between the supply of ink and a plurality of outlet openings defined by the ink supply assembly; and

an elongate printhead chip that is mounted on the ink supply assembly to be fed with ink from the ink supply assembly.

5 The elongate channel may be of a nickel iron alloy. In particular, the elongate channel may be a 36% nickel iron alloy.

10 The printhead assembly may include a number of ink printhead modules positioned in the channel member such that the ink supply assemblies are positioned end-to-end in the channel member and the printhead chips define an array that spans a print medium, in use.

15 The elongate ink supply assembly of each module may include an ink feed member that is positioned on the floor of the channel member and defines a number of ink channels, extending longitudinally with respect to the channel member and in fluid communication with an ink supply and a plurality of outlet openings in fluid communication with respective ink channels from which ink can be fed.

20 An ink delivery assembly may be positioned on each ink feed member. Each ink delivery assembly may define a mounting formation to permit the printhead chip to be mounted on the ink delivery system, a plurality of ink inlets that are in fluid communication with the outlet openings of the ink feed member, a plurality of exit holes and tortuous ink flow paths from each ink inlet to a number of respective exit holes. Each printhead chip may incorporate a plurality of nozzle arrangements that extend along a length of the chip. The printhead chip may be positioned so that the ink can be fed from the exit holes to the printhead chip.

25 Each ink feed member may be in the form of an extrusion of an elastomeric material. The channels may extend longitudinally in the extrusion and the outlet openings may be holes defined in a surface of the extrusion to be in fluid communication with respective ink channels.

30 Each ink delivery assembly may include a pair of micro-moldings that are positioned so that a lower micro-molding is interposed between an upper micro-molding and the ink feed member. The lower micro-molding may define a plurality of ink chambers

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