



US007156492B2

(12) **United States Patent**
Silverbrook et al.

(10) **Patent No.:** **US 7,156,492 B2**
(45) **Date of Patent:** ***Jan. 2, 2007**

(54) **MODULAR PRINthead ASSEMBLY WITH A CARRIER OF A METAL ALLOY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **11/450,440**

(22) Filed: **Jun. 12, 2006**

(65) **Prior Publication Data**

US 2006/0227185 A1 Oct. 12, 2006

Related U.S. Application Data

(63) Continuation of application No. 11/250,450, filed on Oct. 17, 2005, now Pat. No. 7,066,573, which is a continuation of application No. 10/728,922, filed on Dec. 8, 2003, now Pat. No. 6,997,545, which is a continuation of application No. 10/102,700, filed on Mar. 22, 2002, now Pat. No. 6,692,113.

(30) **Foreign Application Priority Data**

Mar. 27, 2001 (AU) PR3996

(51) **Int. Cl.**

B41J 2/14 (2006.01)
B41J 2/16 (2006.01)

(52) **U.S. Cl.** **347/49; 347/50**
(58) **Field of Classification Search** 347/12-13, 347/20, 40, 42, 49-50, 63, 65, 67
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,528,575 A	7/1985	Matsuda et al.	347/47
5,869,595 A	2/1999	Fuller et al.	347/56
6,151,049 A	11/2000	Karita et al.	347/65
6,315,384 B1	11/2001	Ramaswami et al.	347/20
6,341,845 B1	1/2002	Scheffeln et al.	347/50
6,488,355 B1	12/2002	Nakamura et al.	347/40
6,655,786 B1	12/2003	Foote et al.	347/49
7,066,573 B1*	6/2006	Silverbrook et al.	347/49

FOREIGN PATENT DOCUMENTS

WO	WO 01/002172 A	1/2001
WO	WO 01/042022 A	6/2001

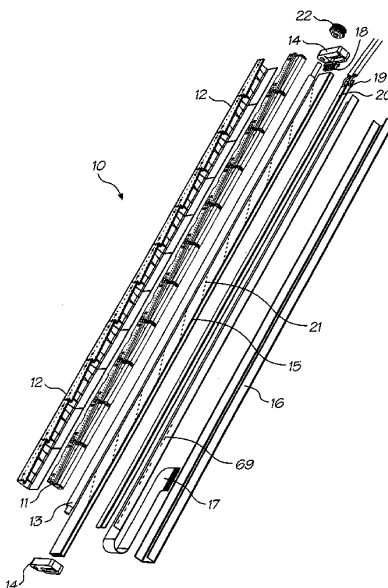
* cited by examiner

Primary Examiner—Juanita D. Stephens

(57) **ABSTRACT**

A modular printhead includes an elongate carrier. An elongate fluid transporter can be received in the carrier and defines a plurality of channels that can each transport a respective type of fluid. A plurality of printing modules is configured is mounted to the elongate ink transporter so that each printing module engages in fluid communication with each channel. A flexible printed circuit board (PCB) is located between the carrier and the fluid transporter. The PCB includes data connections to be interfaced to the printing modules.

9 Claims, 19 Drawing Sheets



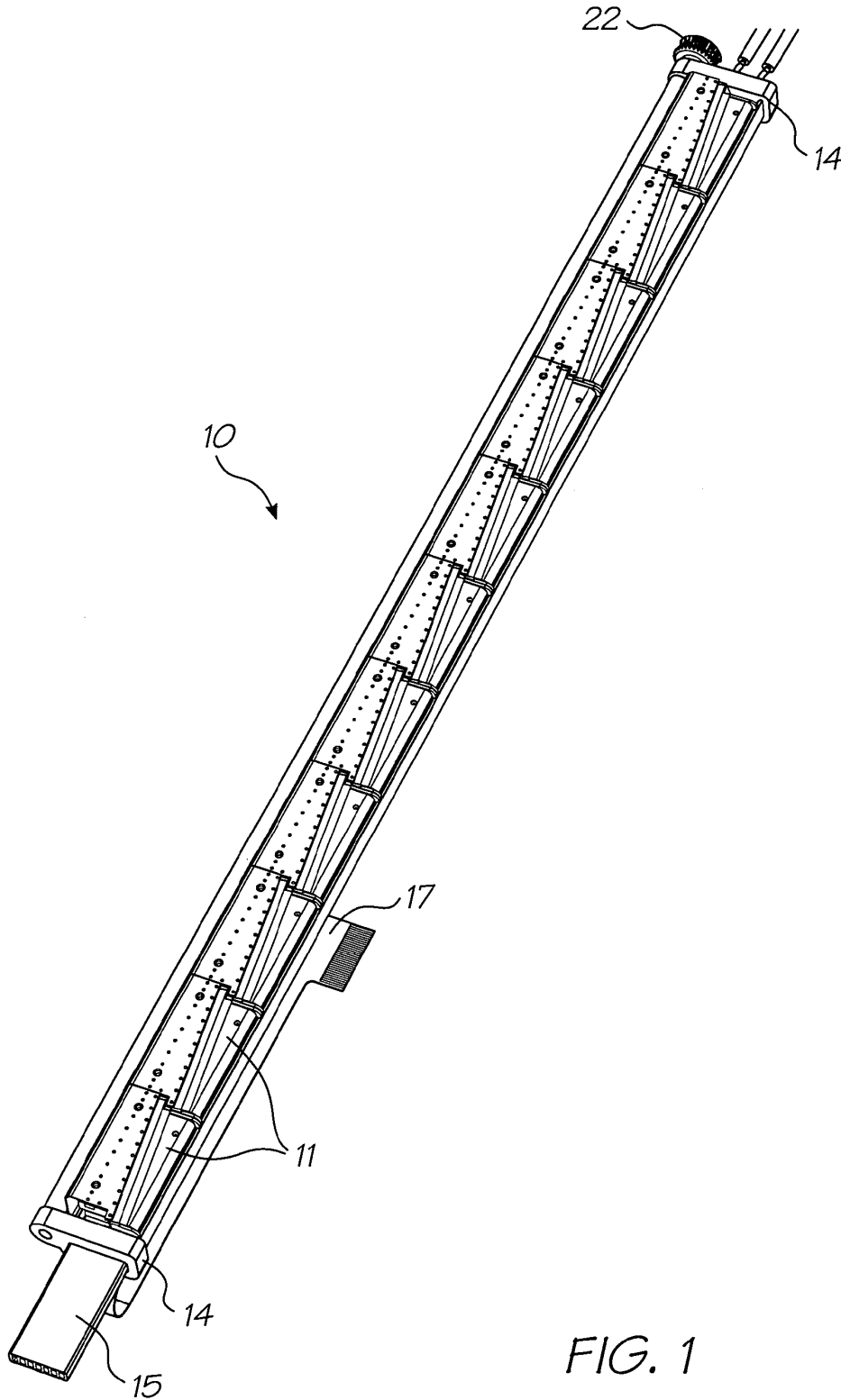


FIG. 1

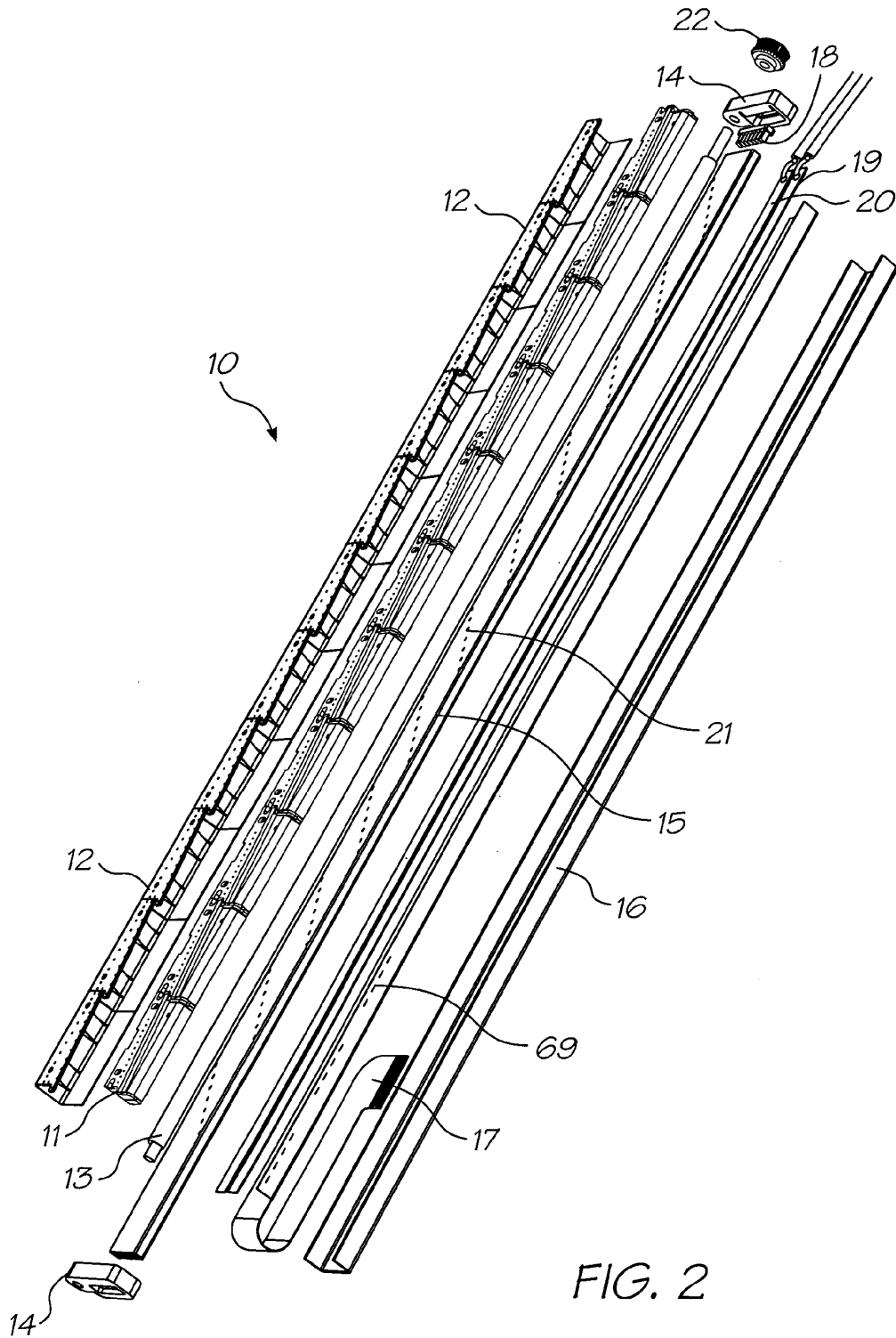


FIG. 2

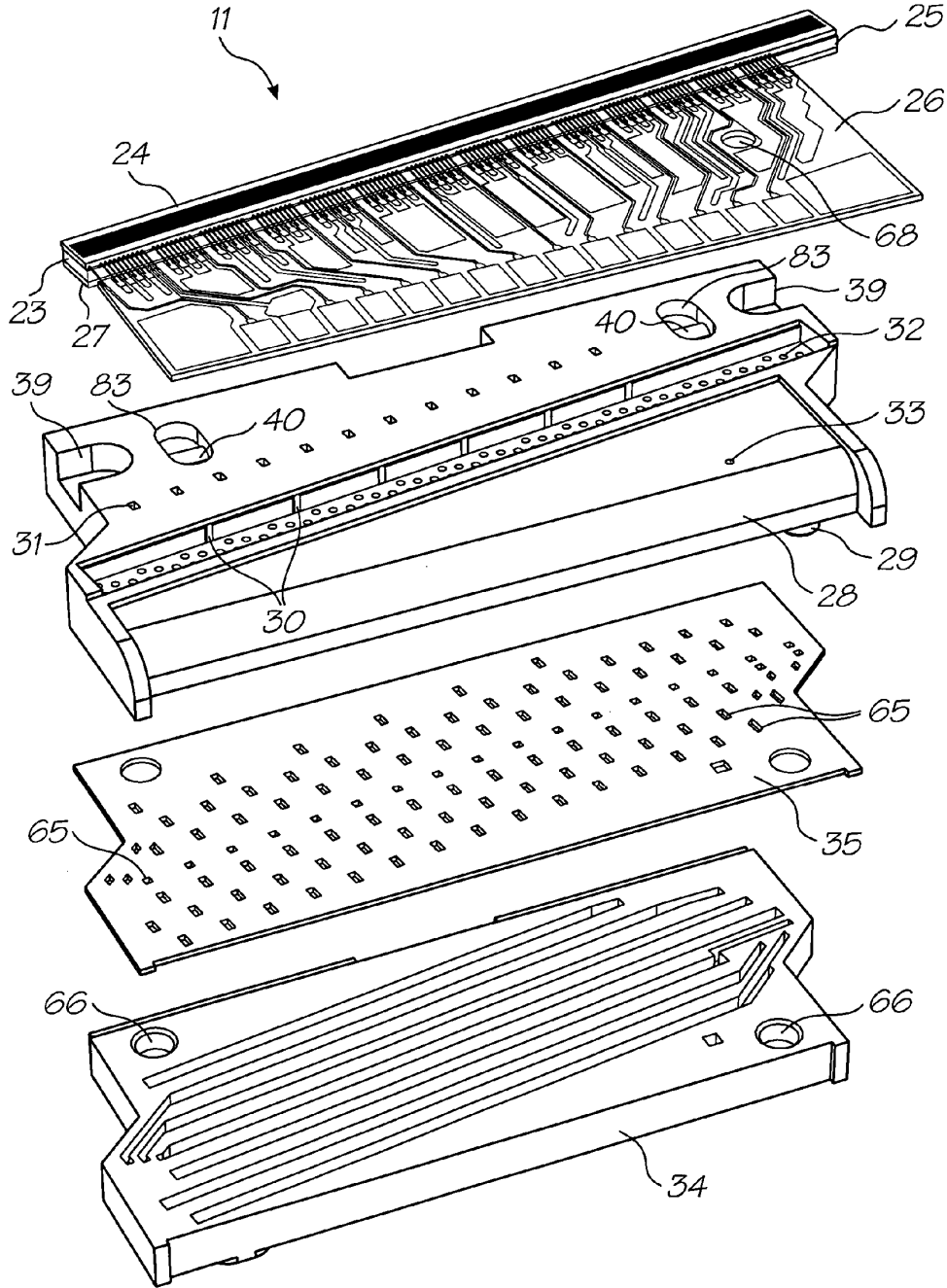


FIG. 3

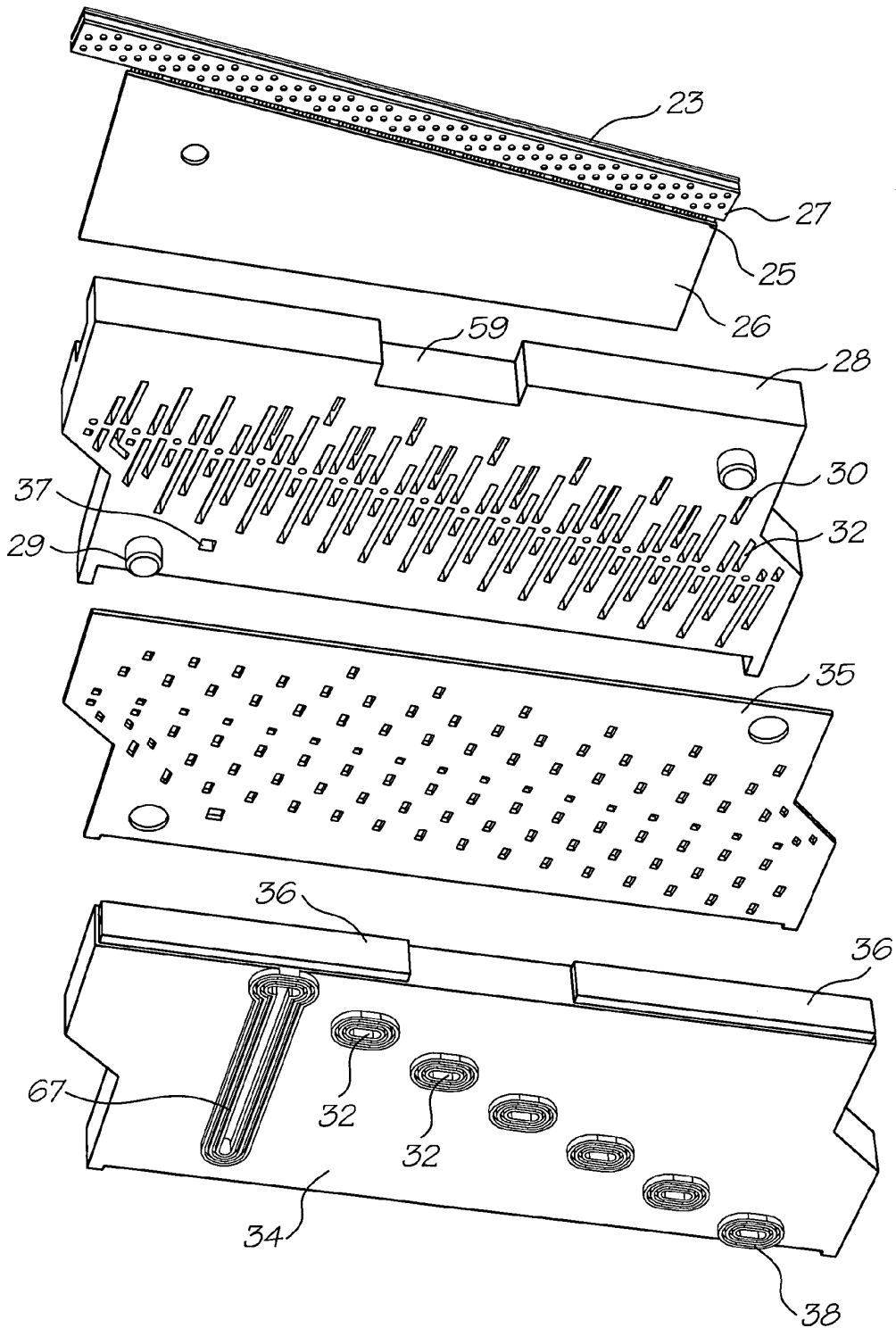


FIG. 3a

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