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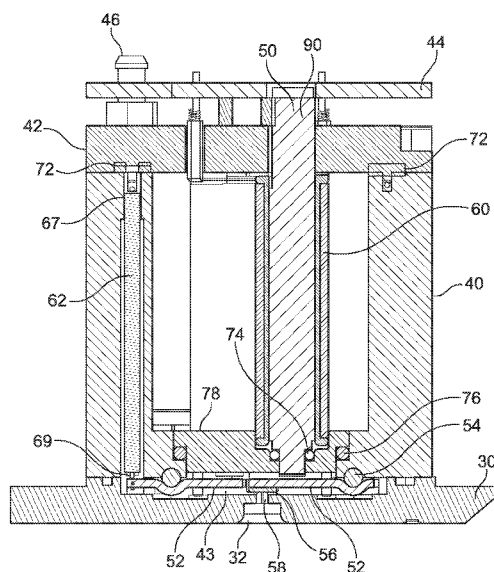


FIG. 5

(57) Abstract: A print head includes a fluid cavity and nozzle in fluid communication with the fluid cavity. A stopper is positioned adjacent the nozzle and adapted to control flow of fluid through the nozzle. An arm supports the stopper and is configured to pivotally move the stopper with respect to the nozzle. An electromagnet is positioned adjacent the arm and configured to move the arm toward the electromagnet to open the nozzle.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B41J F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 784 083 A (SCHUMANN MATTHEW ALEXANDER [GB] ET AL) 21 July 1998 (1998-07-21) column 2, line 29 - column 3, line 45 figures 3,4	1,5-26
A	----- WO 2009/097868 A1 (FESTO AG & CO KG [DE]; MUNZ GEBHARD [DE]; GASSMANN ANDREAS [DE]; GIOUS) 13 August 2009 (2009-08-13) the whole document	1,11,21, 26
A	----- US 5 090 441 A (RICHMOND JAMES W [US]) 25 February 1992 (1992-02-25) the whole document -----	1,11,21, 26



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5784083	A	21-07-1998	DE 69405712 D1	23-10-1997
			DE 69405712 T2	08-01-1998
			EP 0682602 A1	22-11-1995
			JP H08506287 A	09-07-1996
			US 5784083 A	21-07-1998
			WO 9418010 A1	18-08-1994

WO 2009097868	A1	13-08-2009	AT 509222 T	15-05-2011
			EP 2193298 A1	09-06-2010
			WO 2009097868 A1	13-08-2009

US 5090441	A	25-02-1992	NONE	
