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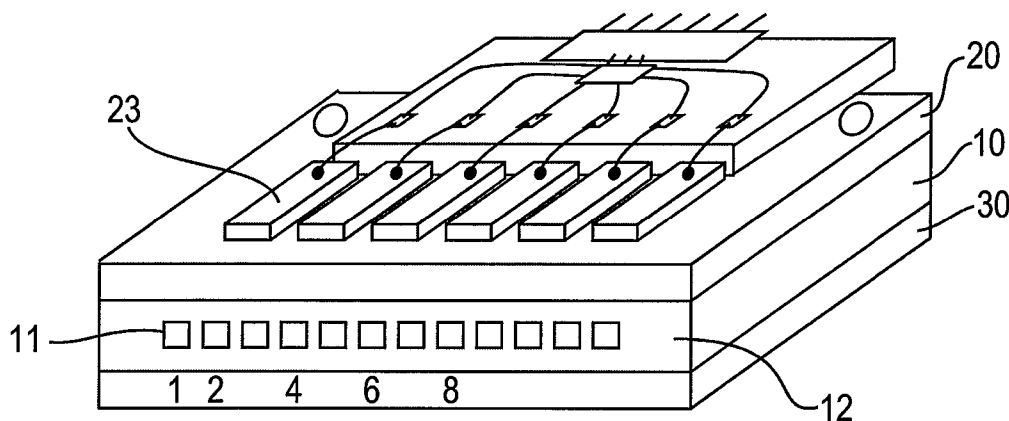
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(54) Title: FLUID JET PRINT MODULE



(57) Abstract: A print module having nozzles which are centrally disposed in a nozzle face of the module is disclosed. The arrangement of the nozzles is symmetric with respect to fluidic paths in the nozzle plates or chamber plates. The connecting channels between chambers and nozzles can also be symmetric, allowing improved performance and uniformity of drop formation, drop size and drop velocity. The module does not suffer from fluid path differences between chamber plates, uses materials similar to the completed print module without the use of bonding agents such as adhesives, and greatly improves the jetting quality by using uniform or symmetric nozzles. In addition, the print module is slim, flat, robust, and can be slanted in order to increase resolution. A variety of fluids may be dispensed by the print module, including ink. The nozzles and nozzle arrangements in the print module can be made using advanced laser structuring.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/64641

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B41J 2/16 (2007.01) USPC - 347/47 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) IPC(8) - B41J 2/16 (2007.01) USPC - 29/890.1; 347/37,47,68-72 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) USPTO EAST System (US, USPG-PUB, EPO, JPO, FPRS, DERWENT), GoogleScholar		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,769,654 A (TANAKA et al) 06 September 1988 (06.09.1988) Fig. 7, column 4, lines 37-56	1-8, 11, 12
X	US 4,905,017 A (SUGITANI et al) 27 February 1990 (27.02.1990) Fig. 4, column 5, lines 3-7	1-3, 5, 8, 9, 11, 12
X ---	US 5,208,604 A (WATANABE et al) 04 May 1993 (04.05.1993) Fig. 9, Fig. 14, Fig. 22, column 15, lines 32-39, 56-62	1-3, 5, 10-12, 14-19 ---
Y		13
Y	US 5,870,117 A (MOORE) 09 February 1999 (09.02.1999) column 6, lines 9-35	13
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 30 August 2007	Date of mailing of the international search report <div style="font-size: 1.5em; font-weight: bold; text-align: center;">08 FEB 2008</div>	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver <div style="text-align: right; margin-top: 10px;"> </div> PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/64641

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-19

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.