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**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: MULTIPLE DROP WEIGHT PRINthead AND METHODS OF FABRICATION AND USE

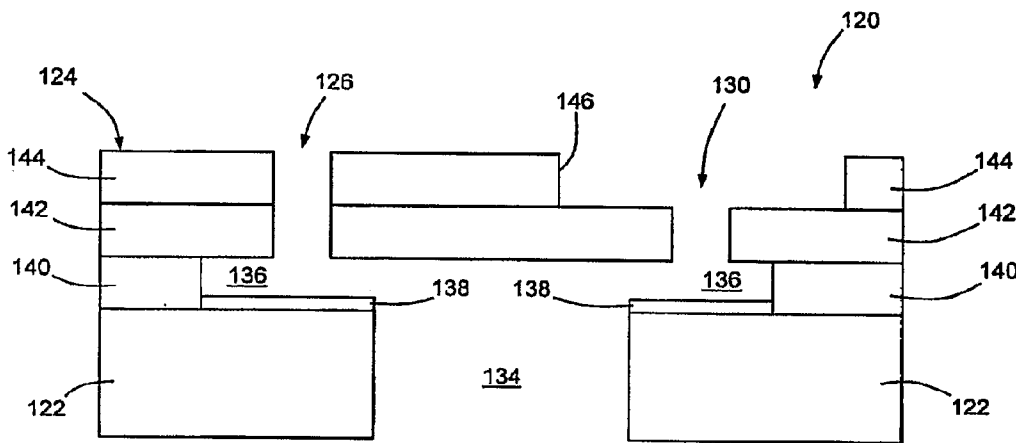


FIG. 4

(57) Abstract: A printhead (120) includes a chamber layer (140) and at least two orifice layers (142,144). A first orifice layer (142) is disposed on the chamber layer (140), and a second orifice layer (144) is disposed on the first orifice layer (142). The second orifice layer (144) has at least one counterbore (146) formed therein. A first nozzle (126) is formed through both orifice layers (142,144) and produces droplets of a first drop weight. A second nozzle is formed through the first orifice layer (142), coincident with the counterbore (146), and produces droplets of a second drop weight that is different than the first drop weight. In one embodiment, the printhead (120) is used in a stand-alone fluid-dispensing device (100).

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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Published:**

— *with international search report*

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21 August 2008

**INTERNATIONAL SEARCH REPORT**

International application No  
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. B41J2/21 B41J3/407 B01L11/00  
 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)  
 B01L B41J  
 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 practical, search terms used)  
 EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/067503 A1 (KATASE MAKOTO [JP]) 31 March 2005 (2005-03-31) paragraphs [0045] - [0064]; figures 2,3	1
A Y		2,3 10
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A	US 2003/065294 A1 (PICKUP RAY L [US] ET AL) 3 April 2003 (2003-04-03) paragraphs [0038] - [0047]; figures 1-3	1-3
	-/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

*A* document defining the general state of the art which is not considered to be of particular relevance	*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
*E* earlier document but published on or after the international filing date	*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
*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)	*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.
*O* document referring to an oral disclosure, use, exhibition or other means	*&* document member of the same patent family
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  13 June 2008	Date of mailing of the international search report  24/06/2008
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Kulhanek, Peter
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## INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006/007270 A1 (KAWAMURA NAOTO [US]) 12 January 2006 (2006-01-12) paragraphs [0020] - [0025]; figure 2	1-3
A	US 2006/061622 A1 (SUZUKI YOSHIHUMI [JP]) 23 March 2006 (2006-03-23) paragraphs [0117] - [0145]; figure 1	4-9
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2007/019769

## 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 additional sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
  
2.  As all searchable claims could be searched without effort justifying an 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.:

### 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.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3

A fluid dispensing device having a printhead for producing droplets of differing weights

2. claims: 4-9

A printhead and a method of fabricating a printhead having several layers and where two nozzles are formed through said layers and where one nozzle is coincident with a counterbore

3. claim: 10

A method of determining a dispensing geometry of a fluid dispensing device for obtaining a desired droplet weight by firing a plurality of nozzles producing differing droplet weights and determining which nozzle produced the desired droplet weight

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/019769

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