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- (71) Applicant (for all designated States except US): **IMI VISION LIMITED** [GB/GB]; Tything Road, Alcester, Warwickshire B49 6EU (GB).

[GB/GB]; 4 High Street, Easton on the Hill, Stamford PE9 3LR (GB).

(74) Agent: **BARKER BRETTELL LLP**; 138 Hagley Road, Edgbaston, Birmingham B16 9PW (GB).

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[Continued on next page]

(54) Title: PISTON PUMP AND DRIVER THEREFOR

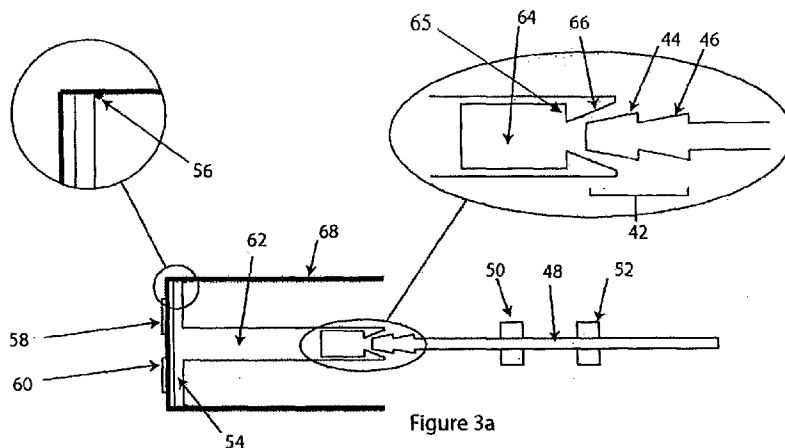


Figure 3a

(57) Abstract: A pump driver, a disposable pump cartridge for use with the pump driver and a beverage dispenser employing the pump drive are disclosed. The disposable pump cartridge comprises at least one barrel (20) having an inlet valve (24) and an outlet valve (26) associated therewith. A piston (28) movable within the barrel (20) is retained in a minimum volume position during transit by a protrusion (22) on the internal surface of the barrel (20). The piston (28) has a piston shaft (28) with a hollow end arranged, in use, to releasably engage a piston driver to drive the piston (28) from its minimum volume position to an operative position, and to reciprocate the piston (28) within the barrel (20) in its operative position to draw fluid into and pump fluid from the barrel (20) via the inlet valve (24) and outlet valve (26) respectively. Methods of engaging, disengaging and changing the disposable pump cartridge are also disclosed.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. B67D1/10 B67D1/00

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)
B67D

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	WO 2006/097724 A (IMI VISION LTD [GB]; WALLACE MARK [GB]; CHESSAR RYAN JOHN [GB]; JOHTY) 21 September 2006 (2006-09-21) page 12, line 28 - line 31 page 16, line 4 - line 13	1-3
A	GB 2 416 757 A (IMI VISION LTD [GB]) 8 February 2006 (2006-02-08) page 16, line 4 - line 16	1
A	US 3 727 799 A (NIXON P) 17 April 1973 (1973-04-17) column 6, line 8 - line 44; figure 7	1

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
- *E* earlier document 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

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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.
Fax: (+31-70) 340-3016

Authorized officer

Desittere, Michiel

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2008/000080

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 all searchable 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.:

1-7

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: 1-7

pump driver with a chamfered or radiused end for engaging a drive shaft with a hollow end

2. claims: 8-12

pump driver with a cam mechanism

3. claims: 13-39

pump driver with disengagement means to disengage the piston shaft from the engagement means

4. claims: 40-42,44,46-51

beverage dispenser with means for controlling the concentrate-to-diluent ratio; method therefor.

5. claim: 43

beverage dispenser capable of dispensing a plurality of differently flavoured beverages.

6. claim: 45

method for disengaging a disposable pump cartridge

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
WO 2006097724	A	21-09-2006	EP	1863723 A2	12-12-2007
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			WO	2006013362 A1	09-02-2006
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US 3727799	A	17-04-1973	NONE		