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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS AND METHODS TO DISPENSE FLUID FROM A BANK OF CONTAINERS AND TO REFILL SAME

(57) Abstract: An example cascade system includes a manifold having a fluid outlet port to dispense fluid and a fluid valve engaged to the manifold. First and second fluid storage containers are coupled to the manifold. The fluid valve is configured to control a first fluid flow path between the second fluid storage container and the fluid outlet port.

WO 2007/108876 A3

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. F17C5/06 F17C7/00

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)
F17C

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.
E	EP 1 800 930 A (HONDA MOTOR CO LTD [JP]) 27 June 2007 (2007-06-27) the whole document	1-12
X	FR 2 874 247 A1 (AIR LIQUIDE [FR]) 17 February 2006 (2006-02-17) the whole document	1-12
P,X	FR 2 878 312 A1 (AIR LIQUIDE [FR]) 26 May 2006 (2006-05-26) the whole document	1-12
X	EP 1 398 603 A (AIR PROD & CHEM [US]) 17 March 2004 (2004-03-17) the whole document	1-12

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[X] Further documents are listed in the continuation of Box C.

[X] 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

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"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	Date of mailing of the international search report
18 July 2007	23/10/2007

Name and mailing address of the ISA/	Authorized officer
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1

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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.
X	EP 1 146 277 A (AIR LIQUIDE [FR]) 17 October 2001 (2001-10-17) the whole document	1-12
X	FR 2 841 890 A1 (AIR LIQUIDE [FR]) 9 January 2004 (2004-01-09) the whole document	1-12
E	FR 2 891 347 A (AIR LIQUIDE [FR]) 30 March 2007 (2007-03-30) the whole document	1-12
X	US 2005/016185 A1 (EMMER CLAUS D [US] ET AL) 27 January 2005 (2005-01-27) the whole document	1-12
X	WO 2005/010427 A (TOYOTA MOTOR CO LTD [JP]; MIKI YOSHIYUKI [JP]; SHIRAI KAZUNARI [JP]; K) 3 February 2005 (2005-02-03) the whole document	1-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/004123

Box 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 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 fee, this Authority did not invite payment of any additional fee.

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.:

1-12

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ 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: 1-12

A fluid dispensing system comprising a manifold having a fluid outlet port to dispense fluid, a fluid valve engaged to the manifold, a first fluid storage container coupled to the manifold, and a second fluid storage container coupled to the manifold, wherein the fluid valve is configured to control a first fluid flow path between the second fluid storage container and the fluid outlet port.

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2. claims: 13-18

A valve comprising a bonnet having a bonnet cavity defining a bonnet inner surface, a bonnet outer surface, and a first pressure sensing passageway extending between the bonnet outer surface and the bonnet cavity, a base coaxiaily coupled to the bonnet and having a base outer surface, a base cavity defining a base inner surface, a fluid inlet passageway extending between the base outer surface and the base cavity, a fluid outlet passageway extending between the base outer surface and the base cavity, and a second pressure sensing passageway extending between the base outer surface and the base cavity, and a valve element within the base and bonnet cavities to control a fluid flow path through the fluid inlet passageway and the fluid outlet passageway.

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3. claims: 19-27

A manifold comprising a first cavity to receive a first fluid valve, a fluid outlet port, a first fluid inlet port to couple to a first fluid storage container, and a second fluid inlet port to couple to a second fluid storage container, wherein the outlet port is configured to dispense fluid received via the first
fluid inlet port and the second fluid inlet port.

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4. claims: 28-31

A dual check ?valve device comprising a housing, a first check valve in the housing, and a second check valve located in the housing adjacent the first check valve and in substantial axial alignment with the first check valve.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2007/004123

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