

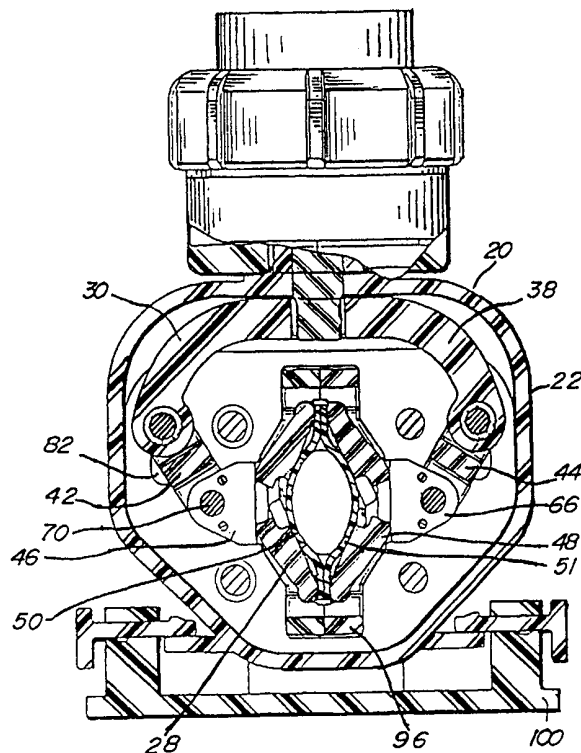


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>F16K 7/04</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 00/03165</b> <b>(43) International Publication Date:</b> 20 January 2000 (20.01.00)
<b>(21) International Application Number:</b> PCT/US99/15382 <b>(22) International Filing Date:</b> 9 July 1999 (09.07.99) <b>(30) Priority Data:</b> 60/092,248 10 July 1998 (10.07.98) US 09/349,317 8 July 1999 (08.07.99) US <b>(71) Applicant:</b> FLUOROWARE, INC. [US/US]; 102 Jonathan Boulevard North, Chaska, MN 55318 (US). <b>(72) Inventors:</b> MCPEAK, Thomas, J.; 389 Alexander Court, Shakopee, MN 55379 (US). LINDER, James, C.; 6150 Strawberry Lane, Shorewood, MN 55331 (US). MCKENZIE, Jeffrey, J.; 11746 State Highway 25 S.W., Watertown, MN 55388 (US). MELBOSTAD, Steven, A.; 1379 Thistle Lane, Shakopee, MN 55379 (US). JOHNSON, Michael, W.; 3435 40th Avenue South, Minneapolis, MN 55406 (US). <b>(74) Agents:</b> CHRISTENSEN, Douglas, J. et al.; Patterson & Keough, P.A., 4800 IDS Center, 80 South Eighth Street, Minneapolis, MN 55402-2100 (US).	<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <b>(88) Date of publication of the international search report:</b> 20 April 2000 (20.04.00)	

**(54) Title:** PINCH ELEMENT PLASTIC VALVE**(57) Abstract**

A valve (20) has a contractible valve element (28) formed of an inner laminae of PFA and an outer laminae of PTFE having bosses (54, 56). The contractible portion is welded to a PFA tubular end portion thus providing the advantages of a PTFE laminae with a boss and the PFA that it surfaces. The valve utilizes a valve mechanism (30) which has a yoke (38) which moves radially towards and away from the contractible valve element with linkages (42, 44) extending from the yoke arms which connect to the bosses. The valve element may thus be positively closed and positively opened. The hermetic seal between the outer PTFE laminae and the inner PFA laminae causes the inner laminae to extend outwardly when the outer laminae is positively distended thereby allowing the valve to function where the fluid being controlled is under a negative pressure. The invention also includes the method of manufacturing the multiple layered valve element.



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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/15382

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : F16K 7/04  
US CL : 251/7

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)

U.S. : 251/7, 9; 138/142, 170, 171, 177

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,297,773 A (COLLINS et al) 29 March 1994, entire document.	1,2,5
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Y		3,4,6-12
Y	US 4,929,293 A (OSGAR) 29 May 1990, entire document.	3,4,6-12
Y	US 3,791,617 A (PRESS) 12 February 1974, entire document.	4,7-12
Y	US 3,473,779 A (GUSTAFSON et al) 21 October 1969, entire document.	1-12
Y	US 4,326,695 A (LINCOLN) 27 April 1982, entire document.	1-12
Y	US 4,876,041 A (HANSELKA) 24 October 1989, entire document.	13-16

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	*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
*A* document defining the general state of the art which is not considered to be of particular relevance	*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
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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	

Date of the actual completion of the international search  
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Date of mailing of the international search report  
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Name and mailing address of the ISA/US  
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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/15382

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 4,927,999 A (HANSELKA) 22 May 1990, entire document.	13-16
A	US 5,526,985 A (MARTIN) 18 June 1996, entire document.	13-16

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/15382**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

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

Please 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 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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/15382

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING**

This ISA found multiple inventions as follows:

Group I, claims 1-12, drawn to a valve.

Group II, claims 13-16, drawn to a method of welding tubes.

The invention of group I describes a valve with a flexible valve element and a valve mechanism to open and close the valve, while the invention of group II describes a method of welding tubes. The two inventions do not share a common special technical feature since group I is directed at a valve and group II is directed at a welding method.