



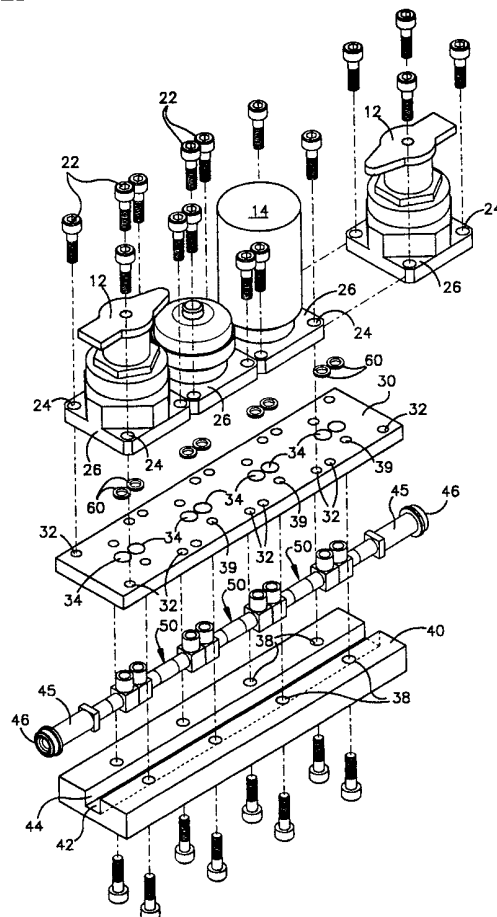
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : F16K 27/00	A3	(11) International Publication Number: WO 99/59392 (43) International Publication Date: 25 November 1999 (25.11.99)												
<p>(21) International Application Number: PCT/US99/10980</p> <p>(22) International Filing Date: 18 May 1999 (18.05.99)</p> <p>(30) Priority Data:</p> <table border="0"> <tr> <td>60/085,817</td> <td>18 May 1998 (18.05.98)</td> <td>US</td> </tr> <tr> <td>60/102,277</td> <td>29 September 1998 (29.09.98)</td> <td>US</td> </tr> <tr> <td>PCT/US99/04973</td> <td>5 March 1999 (05.03.99)</td> <td>US</td> </tr> </table> <p>(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application</p> <table border="0"> <tr> <td>US</td> <td>Not furnished (CIP)</td> </tr> <tr> <td>Filed on</td> <td>Not furnished</td> </tr> </table> <p>(71) Applicant (for all designated States except US): THE SWAGELOK COMPANY [US/US]; 29500 Solon Road, Cleveland, OH 44139 (US).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): EIDSMORE, Paul, G. [US/US]; 1700 Granite Creek Road, Santa Cruz, CA 95065 (US). MOHLENKAMP, Michael, J. [US/US]; 4422 Baintree Road, University Heights, OH 44118 (US). OLECHNOW-ICZ, Benjamin, J. [US/US]; 347 Lincoln Avenue, Cuyahoga Falls, OH 44221 (US). SCHILT-DEINES, Christine,</p>	60/085,817	18 May 1998 (18.05.98)	US	60/102,277	29 September 1998 (29.09.98)	US	PCT/US99/04973	5 March 1999 (05.03.99)	US	US	Not furnished (CIP)	Filed on	Not furnished	<p>M. [US/US]; 11905 Concord-Hambden Road, Concord, OH 44077 (US). NORDSTROM, Douglas [US/US]; 715 Castle Boulevard, Akron, OH 44313 (US). McCOY, James [US/US]; 6805 Mayfield Road #620, Mayfield Heights, OH 44124 (US).</p> <p>(74) Agents: RICKEY, June, E. et al.; Calfee, Halter & Griswold LLP, Suite 1400, 800 Superior Avenue, Cleveland, OH 44114-2688 (US).</p> <p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, 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, US, 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).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 8 June 2000 (08.06.00)</p>
60/085,817	18 May 1998 (18.05.98)	US												
60/102,277	29 September 1998 (29.09.98)	US												
PCT/US99/04973	5 March 1999 (05.03.99)	US												
US	Not furnished (CIP)													
Filed on	Not furnished													

(54) Title: MODULAR SURFACE MOUNT MANIFOLD ASSEMBLIES

(57) Abstract

A modular manifold system is provided for interconnecting fluid components of a fluid system in a reduced area. The system is comprised of one or more bridge fittings (50) having an internal fluid passageway which has an inlet end in fluid communication with an outlet port of a first fluid component (12, 14), and an outlet end in fluid communication with an inlet port of a second fluid component. The bridge fittings may additionally comprise two or more ports, which one of said ports may be in fluid communication with a manifold on another substrate level. The bridge fittings may be mounted within a channel (42) of a backing plate (40) for structural support or in channel blocks of varying sizes. An optional locator plate (30) may be utilized which is mounted over the ends of the bridge fittings in order to align the inlet and outlet ports of the fluid components with the inlet and outlet ends of the bridge fittings. The bridge fittings may also be mounted to the locator plate in multiple directions forming multiple flow paths. Additionally, the bridge fittings may be stacked to form multiple layers where bridge fittings of one layer may be in fluid communication with bridge fittings of another layer. The invention may further comprise fluid seals (60) provided in a recess between the fluid ports (34) and the mating bridge fittings ends.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

Intern. Application No
PCT/US 99/10980

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 F16K27/00

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)
IPC 6 F16K

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X A	EP 0 845 623 A (OHMI TADAHIRO ;FUJIKIN KK (JP)) 3 June 1998 (1998-06-03) page 5, line 37 - line 46; figure 3	1, 3, 5-7, 9, 12, 18 25-28
X	EP 0 715 112 A (MUELLER A & K GMBH CO KG) 5 June 1996 (1996-06-05) figures 2A, 2C, 6, 7	1, 4
X	EP 0 637 712 A (VYGON) 8 February 1995 (1995-02-08) figures 3, 7, 8	4, 5
A	DE 26 30 050 A (PALEY HYMAN W) 12 January 1978 (1978-01-12) figure 7	1, 4, 5, 12, 18
-/-		

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

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

Date of the actual completion of the international search 23 March 2000	Date of mailing of the international search report 03/04/2000
---	---

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 Christensen, J
--	---

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/10980

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 754 896 A (FUJIKIN KK) 22 January 1997 (1997-01-22) the whole document	1, 5, 12, 18

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/US 99/10980

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0845623	A	03-06-1998	CA 2221911 A JP 10205636 A SG 63775 A US 5983933 A	20-05-1998 04-08-1998 30-03-1999 16-11-1999
EP 0715112	A	05-06-1996	DE 4443081 A	05-06-1996
EP 0637712	A	08-02-1995	FR 2708702 A AT 155219 T CA 2129304 A DE 69404096 D JP 7067968 A US 5460204 A	10-02-1995 15-07-1997 07-02-1995 14-08-1997 14-03-1995 24-10-1995
DE 2630050	A	12-01-1978	NONE	
EP 0754896	A	22-01-1997	JP 9032954 A CA 2181527 A IL 118891 A US 5771919 A	07-02-1997 20-01-1997 14-07-1999 30-06-1998