



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 181 998 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
06.03.2002 Bulletin 2002/10

(51) Int Cl.7: **B22D 17/14**

(43) Date of publication A2:
27.02.2002 Bulletin 2002/09

(21) Application number: **01830543.3**

(22) Date of filing: **16.08.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **The designation of the inventor has not yet been filed**

(74) Representative: **Manzoni, Alessandro
MANZONI & MANZONI, UFFICIO
INTERNAZIONALE BREVETTI, P.le Arnaldo 2
25121 Brescia (IT)**

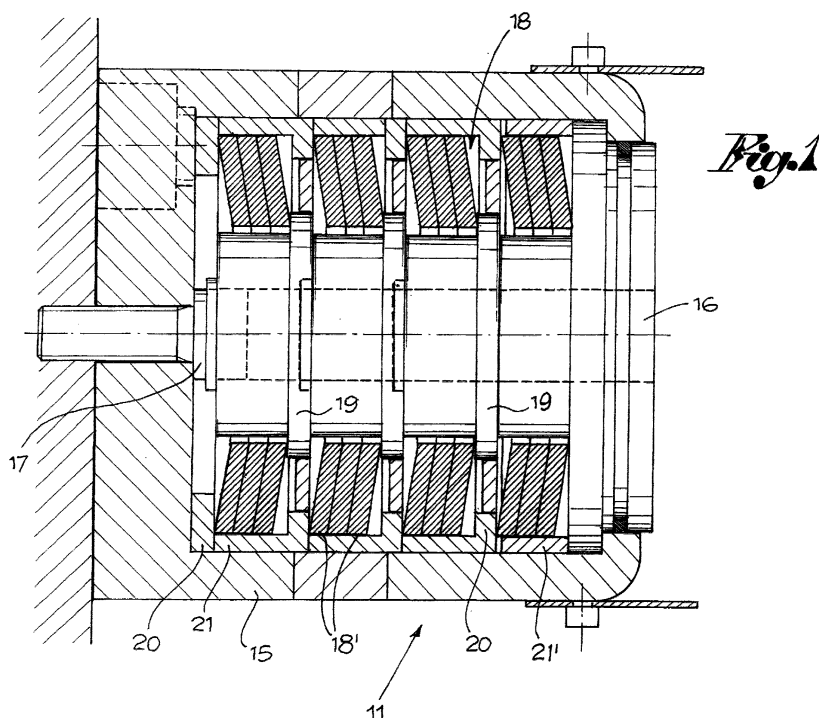
(30) Priority: **24.08.2000 IT BS000060 U**

(71) Applicant: **Bresciani, Edoardo
25070 Sabbio Chiese (Brescia) (IT)**

(54) Equaliser for forced closure of suction valves in die-casting moulds

(57) The invention concerns an equaliser for the forced closure of a suction valve in die-casting moulds. It consists of an external body or casing (11), a central thrust piston (16) guided axially on a guide head (17) and a multiplicity of Belleville washers (18) placed con-

centrically between piston and body. The Belleville washers (18') are set out in groups on several parallel levels defined by spacers, and each group of Belleville washers lies axially with one part on a collar (19) around the thrust piston and the other part on a support washer (20) in the said body.



EP 1 181 998 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0543

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 027 726 A (HODLER FRITZ) 7 June 1977 (1977-06-07) * column 2, line 11 - line 61; figures 2-6 * ----	1	B22D17/14
A	US 3 885 618 A (HODLER FRITZ) 27 May 1975 (1975-05-27) * column 3, line 41 - column 5, line 50; figures 1-4 *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 372 (M-544), 11 December 1986 (1986-12-11) & JP 61 165262 A (TOSHIBA MACH CO LTD), 25 July 1986 (1986-07-25) * abstract *	1	
A	FR 1 416 039 A (HODLER FRITZ) 29 October 1965 (1965-10-29) * page 2, right-hand column, line 34 - page 3, right-hand column, line 8; figures 1,2 *	1	
A	CH 454 369 A (BUEHLER AG GEB) 15 April 1968 (1968-04-15) * the whole document *	1	
A	US 5 488 985 A (WYSER JOHANN) 6 February 1996 (1996-02-06) * figures 1,5 *	1	<div>TECHNICAL FIELDS SEARCHED (Int.Cl.7)</div> <div>B22D B29C B22C</div>
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 January 2002	Examiner Mailliard, A
<div>CATEGORY OF CITED DOCUMENTS</div> <div> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document </div> <div> T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document </div>			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 83 0543

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-01-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4027726	A	07-06-1977	DE 2427970 A1	18-12-1975
			CH 588905 A5	15-06-1977
			FR 2273612 A1	02-01-1976
			GB 1477589 A	22-06-1977
			IT 1038536 B	30-11-1979
			JP 980429 C	18-12-1979
			JP 51008121 A	22-01-1976
			JP 54013851 B	02-06-1979
US 3885618	A	27-05-1975	AU 6097373 A	10-04-1975
			BE 804805 A1	02-01-1974
			CA 1020715 A1	15-11-1977
			CH 547138 A	29-03-1974
			DE 2249417 A1	11-04-1974
			ES 419182 A1	16-04-1976
			FR 2201940 A1	03-05-1974
			GB 1384853 A	26-02-1975
			IT 984140 B	20-11-1974
			JP 1126938 C	14-12-1982
			JP 49073329 A	16-07-1974
			JP 57015982 B	02-04-1982
			NL 7313613 A	09-04-1974
			SU 476735 A3	05-07-1975
JP 61165262	A	25-07-1986	NONE	
FR 1416039	A	29-10-1965	NONE	
CH 454369	A	15-04-1968	NONE	
US 5488985	A	06-02-1996	DE 4302798 C1	16-06-1994
			AT 163584 T	15-03-1998
			AU 674903 B2	16-01-1997
			AU 5484294 A	04-08-1994
			CA 2114581 A1	03-08-1994
			CN 1095000 A ,B	16-11-1994
			CZ 9400147 A3	17-08-1994
			DE 59405330 D1	09-04-1998
			DK 612573 T3	28-09-1998
			EP 0612573 A2	31-08-1994
			ES 2114671 T3	01-06-1998
			FI 940460 A	03-08-1994
			HK 1003593 A1	30-10-1998
			HU 66978 A2	30-01-1995
			IL 108454 A	05-12-1996
			JP 6277818 A	04-10-1994

EPO FORM P0469

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 83 0543

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-01-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5488985	A	LV 12087 A	20-07-1998
		LV 12087 B	20-09-1998
		PL 302100 A1	08-08-1994
		RU 2082546 C1	27-06-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82