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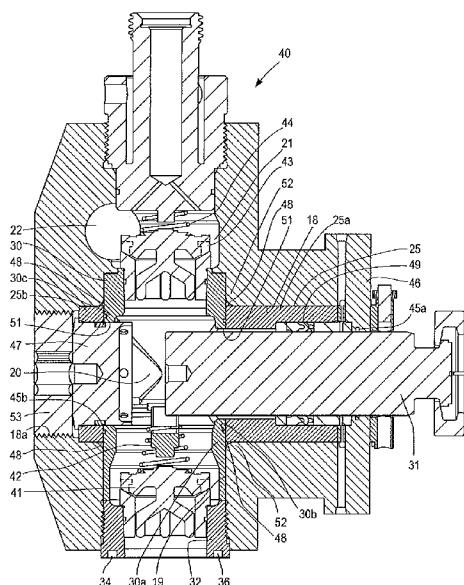
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(54) **Title:** FLUID END WITH PROTECTED FLOW PASSAGES

Fig. 22



(57) **Abstract:** Fluid end for high pressure reciprocating pump, in particular for hydraulic fracturing pumps, comprising: a body having a first bore (18) for receiving a reciprocating plunger (31), a second bore (19) for accommodating a suction valve (41), and a third bore (21) for accommodating a discharge valve (43), the second bore (19) and the third bore (21) being perpendicular to the first bore (18); at least a tubular sleeve (30) in said first bore (18); at least a tubular cartridge (30) in the second bore and/or third bore; and a fluid tight seal between contacting surfaces of said sleeve (30) and said cartridge (30).

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**INTERNATIONAL SEARCH REPORT**

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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. F04B53/00 F04B53/16  
 ADD.  
 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)  
 F04B

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)  
 EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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X	GB 1 235 173 A (BURCKHARDT AG MASCHF [CH]) 9 June 1971 (1971-06-09)  page 4, lines 18-26; figure 1 -----	1-13,28, 32-35, 37-39
A	US 6 910 871 B1 (BLUME GEORGE H [US]) 28 June 2005 (2005-06-28) the whole document -----	1-39
A	US 2008/080994 A1 (GAMBIER PHILIPPE [US] ET AL) 3 April 2008 (2008-04-03) cited in the application the whole document -----	1-39

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search  4 September 2014	Date of mailing of the international search report  17/09/2014
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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  Olona Laglera, C
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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