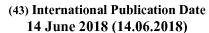


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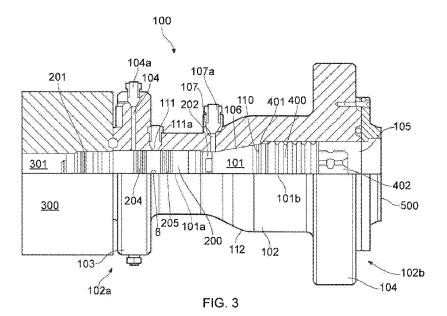
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(54) Title: VALVE DEVICE AND METHOD



(57) Abstract: A valve device (100) having a valve (200) with first connection elements (201) for mounting the valve (200) in a port (301) of a wellhead (300), a spool unit (102) having a through-channel (101), second connection elements (110) arranged in the through-channel (101), and a flange (103), the flange (103) configured for sealingly mounting the spool unit (102) to the wellhead (300), aligning the through-channel (101) with the port (301), and a plug (400) comprising third connection elements (401) configured for sealingly and removably engaging the second connection elements (110) and attach the plug (400) in the through-channel (101). A method for removing, replacing or arranging a valve (200) located in a port (301) of a wellhead (300) is also provided.



MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER INV. E21B34/02

ADD.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) E21B

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				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
Х	WO 2012/009451 A1 (WHITE RICHARD [US]; HOMFELD ALFRED [US])	1-4,14		
А	19 January 2012 (2012-01-19) paragraphs [0002] - [0051] figures 1-5	5-13		
Χ	US 2 250 244 A (YANCEY JOHN R) 22 July 1941 (1941-07-22)	1-4,14		
А	page 2, left-hand column, line 13 - page 4, left-hand column, line 51 figures 1-4	5-13		
Х	US 2008/087439 A1 (DALLAS L MURRAY [US]) 17 April 2008 (2008-04-17) paragraphs [0002] - [0065] figures 1-24	1		
	-/			

Y Further documents are listed in the continuation of Box C.	X See patent family annex.
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filling date "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) "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
8 May 2018	08/08/2018
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 Kecman, Ivan

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International application No. PCT/N02017/050313

INTERNATIONAL SEARCH REPORT

Box No. 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 No. 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
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 fees, this Authority did not invite payment of additional fees.
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.: 1-14
Remark on Protest The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee. The additional search fees were accompanied by the applicant's protest but the applicable protest
Tee was not paid within the time limit specified in the invitation. 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: 1-14

A valve mounted in a port of a wellhead; a spool unit with a through-channel extending between a first and a second end, second connection elements arranged in the through-channel, and a flange for mounting to the wellhead, aligning the through-channel with the port; and a plug comprising third connection elements configured for engaging the second connection elements and attach the plug in the through-channel.

2. claims: 15-23

A method for installing, removing or replacing a valve located in a port of a wellhead, comprising: mounting a valve unit and a placement and removal tool to the wellhead; inserting an arm of the placement and removal tool into the spool unit, operating the arm to disengage the plug from the spool unit, and withdrawing the arm and the plug out of the spool unit; detaching the placement and removal tool and the plug from the valve unit; reattaching the placement and removal tool to the valve unit; inserting the arm into the spool unit to install or remove the valve to/from the port, and withdrawing the arm out of the spool unit; and detaching the placement and removal tool from the valve unit.

INTERNATIONAL SEARCH REPORT

International application No
PCT/N02017/050313

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
\ \	WO 01/57360 A1 (FMC CORP [US]) 9 August 2001 (2001-08-09) the whole document	1-14
	the whole document	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/N02017/050313

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012009451	A1 19-01-2012	US 2012012341 A1 WO 2012009451 A1	19-01-2012 19-01-2012
US 2250244	A 22-07-1941	NONE	
US 2008087439	A1 17-04-2008	US 2008087439 A1 US 2009283277 A1	17-04-2008 19-11-2009
WO 0157360	A1 09-08-2001	AT 329134 T AU 3476401 A BR 0108291 A CA 2399079 A1 EP 1255912 A1 MX PA02007502 A NO 20023657 A US 2001027865 A1 WO 0157360 A1	15-06-2006 14-08-2001 05-03-2003 09-08-2001 13-11-2002 23-08-2004 27-09-2002 11-10-2001 09-08-2001