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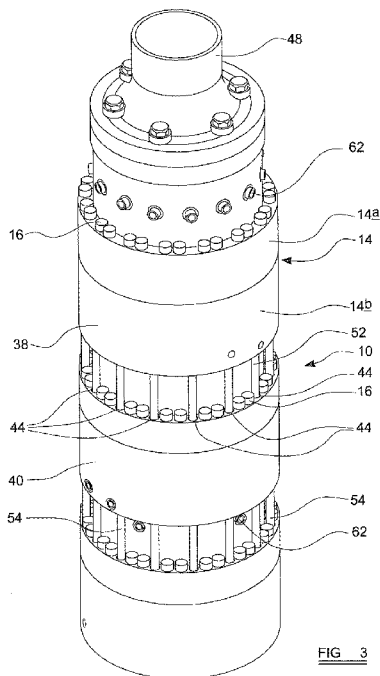
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[Continued on next page]

(54) Title: BLOW OUT PREVENTER



(57) Abstract: A blow out preventer (BOP), in particular a new configuration of BOP which may have a smaller outer diameter for a given operating force than conventional BOPs comprises a housing which has a longitudinal axis and which is divided in a first housing part (14a) and a second housing part (14b), movement of the first housing part relative to the second housing part being prevented by fasteners (16), each fastener including a shaft which extends through a fastener receiving passage provided in the first housing part into a fastener receiving passage provided in the second housing part, the housing being further provided with fluid flow passages (44) which extend from the first part of the housing to the second part of the housing, the fluid flow passages being interspersed between fastener receiving passages. In one embodiment of the invention, three annular BOPs according to this design are integrated to form a stack. A seal assembly is mounted in a central bore of the bore, the lowermost end of the seal assembly being supported on a locking dog (56) which extends from the BOP housing into the central bore. The locking dog is movable, for example using hydraulic actuation means, and can be retracted into the wall of the BOP housing.





DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT,  
LU, LV, 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, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments (Rule 48.2(h))*

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— *with international search report (Art. 21(3))*

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30 May 2013

INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2012/050615

A. CLASSIFICATION OF SUBJECT MATTER  
INV. E21B33/06 E21B33/08  
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)  
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 326 615 A (WILLIAM ARTHUR TROUT; CHESTER ADOLPH RASMUSSEN) 20 March 1930 (1930-03-20)	1,2, 5-12, 16-21,24
Y	figures 1-12 the whole document	13-15, 22,23
X	US 3 561 723 A (CUGINI EDWARD T) 9 February 1971 (1971-02-09)	25-29
Y	claim 11; figure 1 the whole document rotatable preventor	13-15, 22,23
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Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

"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 filing 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  20 March 2013	Date of mailing of the international search report  28/03/2013
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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  van Berlo, André
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB2012/050615

## 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

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 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.:

### 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 fee 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: 1-20

Blowout preventer with flow passages interspersed between fastener passages

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2. claims: 21-24

Three annular blow out preventers coaxially arranged

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3. claims: 25-29

Blow out preventer comprising a fluid pressure actuated locking part

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## INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2012/050615

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	WO 2011/128690 A1 (MANAGED PRESSURE OPERATIONS PTE LTD [SG]; LEUCHTENBERG CHRISTIAN [SG];) 20 October 2011 (2011-10-20)	21-23, 25,26, 28,29
A,P	figure 15 fig 15 showing reference 142, corresponding to bolts in fig 3. page 4, lines 10-12; figure 3 page 8, line 25 - page 9, line 7 page 24, line 29 - page 26, line 13 -----	1,13-15

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2012/050615

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 326615	A	20-03-1930	NONE
US 3561723	A	09-02-1971	NONE
WO 2011128690	A1	20-10-2011	AU 2011241973 A1 25-10-2012
			CA 2795212 A1 20-10-2011
			CN 102892971 A 23-01-2013
			EP 2558676 A1 20-02-2013
			GB 2489265 A 26-09-2012
			SG 184552 A1 29-11-2012
			WO 2011128690 A1 20-10-2011
			WO 2012127180 A2 27-09-2012
			WO 2012127227 A2 27-09-2012