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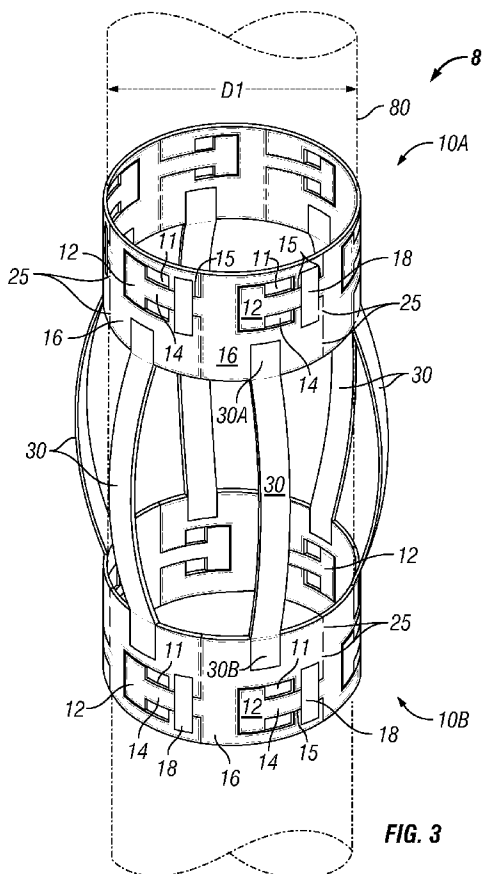
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(54) Title: EXPANDABLE CENTRALIZER FOR EXPANDABLE PIPE STRING



(57) Abstract: A close-tolerance expandable bow spring centralizer (8) having a first expandable collar (10A) coupled to and spaced apart from a second expandable collar (10B) through a plurality of bow springs (30) wherein expandable collars (10A, 10B) comprise a plurality of slidably coupled links (16) that separate to expand the diameter of the collars (10A, 10B), e.g., upon expansion of an expandable pipe string (80) on which the centralizer (8) is received. Expandable bow spring centralizer (8) may grip the expandable pipe string (80) when in the collapsed configuration to eliminate the need for a stop collar. Additionally or alternatively, a fin (32) may be connected to each bow spring (30), and then connected to one or more adjacent fins (32) upon collapse of the bow springs (30) to form a restraining band (39) that may be ruptured, e.g., upon expansion of the expandable pipe string (80).

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ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,
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CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
 INV. E21B17/10 E21B43/10

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 practical, search terms used)
 EPO-Internal

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 148 985 A (BAKER OIL TOOLS INC) 5 June 1985 (1985-06-05) page 3, lines 96-11; figure 1 -----	1-10, 18-22
A	US 3 356 147 A (WILFRED DREYFUSS) 5 December 1967 (1967-12-05) column 2, lines 51-56; figure 4 -----	1-10, 18-22
A	US 3 566 965 A (SOLUM JAMES R) 2 March 1971 (1971-03-02) figure 5 -----	1-10, 18-22
A	US 2 718 266 A (BERRY JOHN R ET AL) 20 September 1955 (1955-09-20) figure 4 -----	1-10, 18-22
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Further documents are listed in the continuation of Box C. See patent family annex.

- * Special categories of cited documents :
- | | |
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| <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> |
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Date of the actual completion of the international search 21 November 2008	Date of mailing of the international search report 28/11/2008
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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 Bellingacci, F
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/063163

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 312 600 A (ALEXANDER STEPS ROBERT) 2 March 1943 (1943-03-02) page 2, left-hand column, lines 55-60 page 3, right-hand column, lines 3-9; figures 1,2	11-13, 15,23,24
A	US 5 261 488 A (GULLET PAUL D [GB] ET AL) 16 November 1993 (1993-11-16) the whole document	11-17, 23-28

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/063163

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 allsearchable 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: 1-10, 18-22

Expandable bow spring centralizer comprising mutually slidable links connected so as to form expandable collars.

2. claims: 11-17, 23-28

Expandable bow spring centralizer comprising bow springs provided with mutually connectable fins.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/063163

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
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US 2312600	A	02-03-1943	NONE	
US 5261488	A	16-11-1993	AT 119234 T CA 2073332 A1 EP 0511254 A1 WO 9110806 A1 NO 922736 A	15-03-1995 18-07-1991 04-11-1992 25-07-1991 10-07-1992