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- (71) Applicant: **WEATHERFORD/LAMB, INC.** [US/US];
2000 St. James Place, Houston, TX 77056 (US).
- (72) Inventor: **TREVINO, Jose, A.**; P.O. Box 55389, Houston,
TX 77055 (US).
- (74) Agents: **PATTERSON, William, B.** et al.; Patterson &
Sheridan, LLP, 24 Greenway Plaza, Suite 1600, Houston,
TX 77046 (US).
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[Continued on next page]

(54) Title: LATCH ASSEMBLY

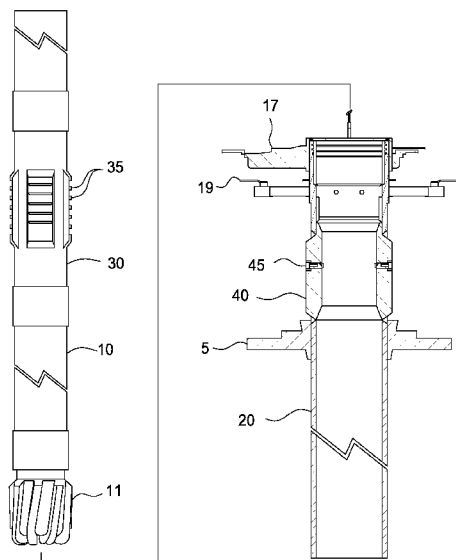


FIG. 1A

FIG. 1B

(57) Abstract: A releasable latch system used to releasably couple a surface casing to a conductor casing. In one embodiment, a latch assembly for coupling a first tubular to a second tubular includes a mandrel having a plurality of key slots; a housing for receiving the mandrel; a plurality of keys radially movable into engagement or out of engagement with a respective key slot; a collet configured to engage the housing and a respective key; and a retainer ring configured to hold the plurality of keys in engagement with the respective key slot.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B17/046 E21B7/20
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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/192704 A1 (FORD DAVID L [US] ET AL) 16 October 2003 (2003-10-16) paragraphs [0024] - [0027] figures 2,3	1-12
A	WO 2004/079151 A2 (WEATHERFORD LAMB [US]; GIROUX RICHARD L [US]; THOMPSON GARY [US]; ODEL) 16 September 2004 (2004-09-16) figures 3A-3C, 4A-4C	1-12



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

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"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

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Schouten, Adri

INTERNATIONAL SEARCH REPORT

International application No.
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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.:

"see additional sheet(s)"

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/US2013/027495

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003192704	A1	16-10-2003	NONE

WO 2004079151	A2	16-09-2004	CA 2517978 A1 16-09-2004
		GB 2416360 A 25-01-2006	
		NO 327517 B1 27-07-2009	
		US 2004216892 A1 04-11-2004	
		WO 2004079151 A2 16-09-2004	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-12

A latch assembly for coupling a first tubular to a second tubular comprising a retainer ring.

2. claims: 13-15

A latch assembly for coupling a first tubular to a second tubular comprising a load block releasably coupled to a mandrel, the load block having slots for mating with keys.

3. claims: 16, 17

A latch assembly for coupling a first tubular to a second tubular comprising a rotatable sleeve for radially moving a respective key and coupled to the key using a shearable thread connection.

4. claim: 18

A latch assembly for coupling a first tubular to a second tubular comprising a mandrel coupled to a first tubular and having a longitudinal groove and an arcuate groove.
