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[Continued on next page]

(54) Title: TELESCOPIC FRACTURING ISOLATION SLEEVE

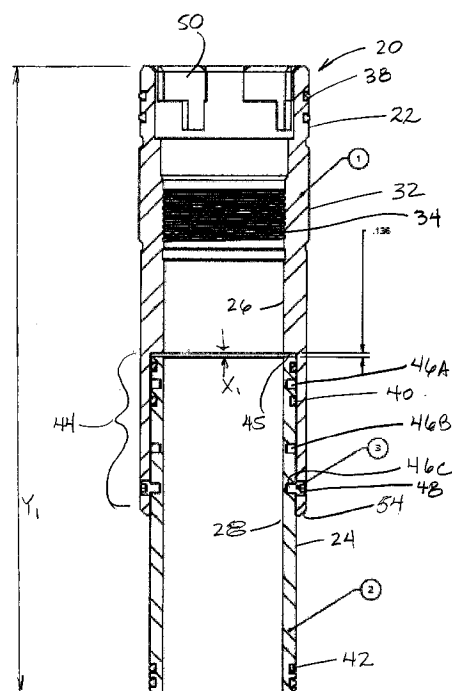


FIG. 2

(57) Abstract: The disclosure provides a fracturing isolation sleeve for a wellhead assembly including a fracturing adapter and tubing head. In at least one embodiment, the sleeve can be telescopic to different lengths to fit different assemblies without necessitating switching the sleeve or portions thereof. The sleeve can be coupled to the wellhead assembly by threaded and non-threaded connections. The sleeve upper portion (22) can be threadably engaged with the wellhead assembly, and/or the sleeve lower portion (24) can be threadably engaged with a packoff bushing rotationally coupled to the wellhead assembly through an anti-rotation mechanism. Further, the sleeve can include a retaining nut to be threadably engaged with the wellhead assembly without necessarily rotating the sleeve upper or lower portions. The sleeve can be also coupled with the wellhead assembly through a mandrel coupled to the sleeve having an actuating cam surface to actuate a lock ring with the wellhead assembly.



MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, 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))*

**Published:**

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

**(88) Date of publication of the international search report:**

18 March 2010

# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2009/035815

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. E21B33/068 E21B17/07

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                | Relevant to claim No. |
|-----------|-------------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | US 6 220 363 B1 (DALLAS L MURRAY [US])<br>24 April 2001 (2001-04-24)<br>column 7, lines 13-25; figure 4a<br>----- | 1-21                  |
| A         | US 5 785 121 A (DALLAS MURRAY L [US])<br>28 July 1998 (1998-07-28)<br>column 2, lines 47-66; figures 1,2<br>----- | 1-21                  |
| A         | US 6 447 021 B1 (HAYNES MICHAEL JONATHON [CA]) 10 September 2002 (2002-09-10)<br>claim 1; figure 1<br>-----       | 1-21                  |

☐ 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 document but published on or after the international filing date

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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

"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 January 2010

Date of mailing of the international search report

01/02/2010

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2009/035815

## 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-21

Isolation sleeve comprising two portions in a teleopic relationship  
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2. claims: 22-32

Isolation sleeve comprising two portions, the upper portions comprising a retention mechanism to retain the sleeve inside a wellhead  
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3. claims: 33-38

Isolation sleeve comprising two portions, the lower portions comprising means for anchoring to a packoff bushing  
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No

PCT/US2009/035815

| Patent document<br>cited in search report |    | Publication<br>date |      | Patent family<br>member(s) |  | Publication<br>date |
|-------------------------------------------|----|---------------------|------|----------------------------|--|---------------------|
| US 6220363                                | B1 | 24-04-2001          | CA   | 2299683 A1                 |  | 16-01-2001          |
| US 5785121                                | A  | 28-07-1998          | NONE |                            |  |                     |
| US 6447021                                | B1 | 10-09-2002          | CA   | 2296195 A1                 |  | 24-05-2001          |
|                                           |    |                     | US   | 2003029621 A1              |  | 13-02-2003          |