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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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- with international search report (Art. 21(3))
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(54) **Title:** EXTRUSION-RESISTANT SEALS FOR EXPANDABLE TUBULAR ASSEMBLY

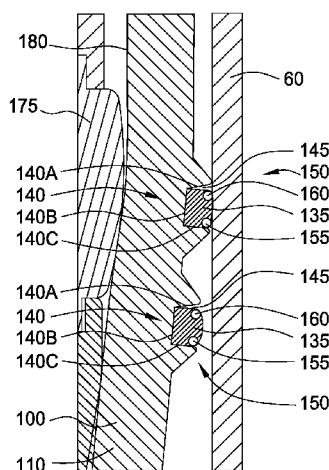


FIG. 3

(57) **Abstract:** The present invention generally relates to extrusion-resistant seals for an expandable tubular assembly. In one aspect, a seal assembly for creating a seal between a first tubular and a second tubular is provided. The seal assembly includes an annular member attached to the first tubular, the annular member having a groove formed on an outer surface of the annular member. The seal assembly further includes a seal member disposed in the groove, the seal member having one or more anti-extrusion bands. The seal member is configured to be expandable radially outward into contact with an inner wall of the second tubular by the application of an outwardly directed force supplied to an inner surface of the annular member. Additionally, the seal assembly includes a gap defined between the seal member and a side of the groove.



# INTERNATIONAL SEARCH REPORT

International application No  
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. E21B43/10 E21B33/12 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> 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		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 3 278 192 A (TAMPLEN JACK W) 11 October 1966 (1966-10-11) figures 7,8,10-12 -----	1,5-11, 22-24 2-4, 12-15,25
X A	US 2004/123983 A1 (COOK ROBERT LANCE [US] ET AL) 1 July 2004 (2004-07-01) figures 2a, 2b, 2c -----	1,16, 19-22,26 17,18,27
X	US 5 467 822 A (ZWART KLAAS J [GB] ) 21 November 1995 (1995-11-21) figures 1,3 -----	1,5-8, 16,22
X	US 5 333 692 A (BAUGH JOHN L [US] ET AL) 2 August 1994 (1994-08-02) figures 1,2,4,5 -----	26,28,29
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents : <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent 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> </div> <div style="width: 45%;"> <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>"&amp;" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search	Date of mailing of the international search report	
9 January 2013	18/01/2013	
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  Maukonen, Kalle	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2012/025508

## 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: 1-25

Seal assembly.

with respect to e.g. prior art document US3278192, the special technical feature (STF) of this invention appears to be that the gap that closes upon expansion of the annular member.

The effect of this STF can be seen as the adequate accommodation of the distortion of the seal upon the annular member's expansion.

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## 2. claims: 26-29

Seal assembly.

with respect to prior art document US3278192, the special technical feature of this invention appears to be the expander sleeve with a tapered outer surface and an inner bore.

The effect of this STF can be seen as the capability of expanding the annular member.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/025508

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3278192	A	11-10-1966	NONE
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