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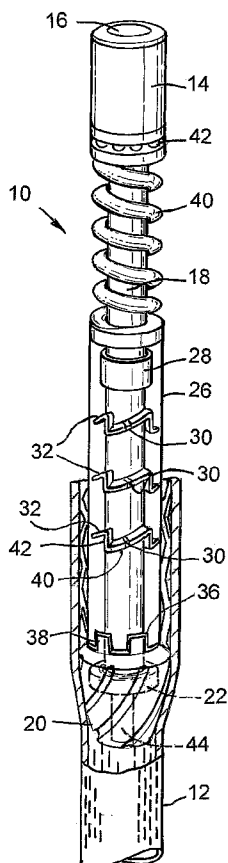
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[Continued on next page]

(54) Title: TUBING EXPANSION



(57) Abstract: A method of expanding tubing comprises the steps: providing a length of expandable tubing; locating an expansion tool, such as a cone, in the tubing; and applying impulses to the tool to drive the tool through the tubing and expand the tubing to a larger diameter. The tubing may be located downhole and may have a solid wall or a slotted wall.

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**INTERNATIONAL SEARCH REPORT**

International Application No  
PCT/GB 02/02797

|   |   |   |
|---|---|---|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>  |   |   |
| IPC 7   | E21B43/10   | E21B4/10                                    |
|   |   | E21B4/14                                    |
|   |   | E21B17/20                                   |
| 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)   |   |   |
| IPC 7 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  |   |   |
| <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   | US 3 191 677 A (KINLEY MYRON M)<br>29 June 1965 (1965-06-29)  | 1,2,6-9,<br>14,24,<br>25,32,<br>37,46,48    |
| Y   | column 2, line 42 - line 53<br>column 4, line 4 - line 14   | 3-5,<br>10-12,<br>28-30,<br>33,35,<br>38-43 |
| Y   | ---<br>US 3 616 868 A (BASSINGER GREY)<br>2 November 1971 (1971-11-02)<br>abstract<br>---   | 3,4,<br>28-30                               |
|   | -/--  |   |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <span style="margin-left: 200px;"><input checked="" type="checkbox"/> Patent family members are listed in annex.</span>  |   |   |
| * Special categories of cited documents :   |   |   |
| "A" document defining the general state of the art which is not considered to be of particular relevance<br>"E" earlier document but published on or after the international filing date<br>"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)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"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<br>"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<br>"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.<br>"&" document member of the same patent family |   |
| Date of the actual completion of the international search   | Date of mailing of the international search report  |   |
| 15 October 2002   | 10. 01. 2003  |   |
| Name and mailing address of the ISA   | Authorized officer  |   |
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016   | Garrido Garcia, M   |   |

## INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages                                   | Relevant to claim No.                              |
|------------|--|--|
| Y          | US 4 890 682 A (WORRALL ROBERT N ET AL)<br>2 January 1990 (1990-01-02)<br>abstract; figure 1<br>---                  | 5,12,33,<br>35,43                                  |
| Y          | US 3 528 498 A (CAROTHERS WILLIAM F)<br>15 September 1970 (1970-09-15)<br>column 2, line 69 -column 3, line 3<br>--- | 10-12  |
| Y          | US 2 153 883 A (POSTER WALTER L)<br>11 April 1939 (1939-04-11)<br>page 2, line 43 - line 71<br>---                   | 38-42  |
| X          | US 3 424 244 A (KINLEY MYRON M)<br>28 January 1969 (1969-01-28)<br><br>column 4, line 21 - line 32<br>-----          | 1,2,7,8,<br>14,16,<br>24,25,<br>36,46,<br>48,49,51 |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 02/02797

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
  
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.:

1-12, 14-19, 24-43, 46-54

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- 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: 1-12,14-19,24-43,46-54

Expansion of tubing by means of mechanical impacts

2. Claims: 13,44,45

Expansion of tubing by means of electromagnetic impulses

3. Claims: 20-23,55-60

Expansion of tubing by means of fluid pressure

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 02/02797

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date   |
|--|------------------|-------------------------|--|
| US 3191677                             | A                | 29-06-1965              | NONE   |
| US 3616868                             | A                | 02-11-1971              | NONE   |
| US 4890682                             | A                | 02-01-1990              | CA 1319675 A1 29-06-1993<br>DE 3776959 D1 09-04-1992<br>EP 0245892 A2 19-11-1987 |
| US 3528498                             | A                | 15-09-1970              | NONE   |
| US 2153883                             | A                | 11-04-1939              | NONE   |
| US 3424244                             | A                | 28-01-1969              | NONE   |