



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> <b>E21B 29/00, B21D 17/04, 39/04</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 00/37767</b>  <b>(43) International Publication Date:</b> 29 June 2000 (29.06.00)		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <b>(21) International Application Number:</b> PCT/GB99/04248  <b>(22) International Filing Date:</b> 22 December 1999 (22.12.99)   <b>(30) Priority Data:</b>  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9828234.6</span> <span>22 December 1998 (22.12.98)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9900835.1</span> <span>15 January 1999 (15.01.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9923783.6</span> <span>8 October 1999 (08.10.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9924189.5</span> <span>13 October 1999 (13.10.99)</span> <span>GB</span> </div>   <b>(71) Applicants:</b> PETROLINE WELLSYSTEMS LIMITED [GB/GB]; Offshore Technology Park, Claymore Drive, Bridge of Don, Aberdeen AB23 8GD (GB). ASTEC DEVELOPMENTS LIMITED [GB/GB]; ODS Building, Greenbank Crescent, East Tullos, Aberdeen AB12 3BG (GB).   <b>(72) Inventors:</b> METCALFE, Paul, David; North Wing, Bucklerburn Steading, Peterculter AB14 0NP (GB). SIMPSON, Neil, Andrew, Abercrombie; Burn of Daff Farm, Downies, Portlethen, Aberdeen AB12 4QX (GB).   <b>(74) Agents:</b> McCALLUM, William, Potter et al.; Cruikshank &amp; Fairweather, 19 Royal Exchange Square, Glasgow G1 3AE (GB).         </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <b>(81) Designated States:</b> AU, BR, CA, NO, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).   <b>Published</b>  <i>With international search report.</i>   <b>(88) Date of publication of the international search report:</b>  <div style="text-align: right;">26 October 2000 (26.10.00)</div> </td> </tr> </table>			<b>(21) International Application Number:</b> PCT/GB99/04248 <b>(22) International Filing Date:</b> 22 December 1999 (22.12.99)  <b>(30) Priority Data:</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9828234.6</span> <span>22 December 1998 (22.12.98)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9900835.1</span> <span>15 January 1999 (15.01.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9923783.6</span> <span>8 October 1999 (08.10.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9924189.5</span> <span>13 October 1999 (13.10.99)</span> <span>GB</span> </div> <b>(71) Applicants:</b> PETROLINE WELLSYSTEMS LIMITED [GB/GB]; Offshore Technology Park, Claymore Drive, Bridge of Don, Aberdeen AB23 8GD (GB). ASTEC DEVELOPMENTS LIMITED [GB/GB]; ODS Building, Greenbank Crescent, East Tullos, Aberdeen AB12 3BG (GB).  <b>(72) Inventors:</b> METCALFE, Paul, David; North Wing, Bucklerburn Steading, Peterculter AB14 0NP (GB). SIMPSON, Neil, Andrew, Abercrombie; Burn of Daff Farm, Downies, Portlethen, Aberdeen AB12 4QX (GB).  <b>(74) Agents:</b> McCALLUM, William, Potter et al.; Cruikshank & Fairweather, 19 Royal Exchange Square, Glasgow G1 3AE (GB).	<b>(81) Designated States:</b> AU, BR, CA, NO, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>  <b>(88) Date of publication of the international search report:</b> <div style="text-align: right;">26 October 2000 (26.10.00)</div>
<b>(21) International Application Number:</b> PCT/GB99/04248 <b>(22) International Filing Date:</b> 22 December 1999 (22.12.99)  <b>(30) Priority Data:</b> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9828234.6</span> <span>22 December 1998 (22.12.98)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9900835.1</span> <span>15 January 1999 (15.01.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9923783.6</span> <span>8 October 1999 (08.10.99)</span> <span>GB</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>9924189.5</span> <span>13 October 1999 (13.10.99)</span> <span>GB</span> </div> <b>(71) Applicants:</b> PETROLINE WELLSYSTEMS LIMITED [GB/GB]; Offshore Technology Park, Claymore Drive, Bridge of Don, Aberdeen AB23 8GD (GB). ASTEC DEVELOPMENTS LIMITED [GB/GB]; ODS Building, Greenbank Crescent, East Tullos, Aberdeen AB12 3BG (GB).  <b>(72) Inventors:</b> METCALFE, Paul, David; North Wing, Bucklerburn Steading, Peterculter AB14 0NP (GB). SIMPSON, Neil, Andrew, Abercrombie; Burn of Daff Farm, Downies, Portlethen, Aberdeen AB12 4QX (GB).  <b>(74) Agents:</b> McCALLUM, William, Potter et al.; Cruikshank & Fairweather, 19 Royal Exchange Square, Glasgow G1 3AE (GB).	<b>(81) Designated States:</b> AU, BR, CA, NO, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>  <b>(88) Date of publication of the international search report:</b> <div style="text-align: right;">26 October 2000 (26.10.00)</div>			
<b>(54) Title:</b> PROFILE FORMATION				
<b>(57) Abstract</b>  <p>A method of forming a profile (10) in a section of tubing (12) comprises: providing an expander device (14) having at least one radially extendable expander member (22); positioning the device (14) at a predetermined location in the tubing (12); and extending the member (22) to deform the tubing (12) to create a profile (10).</p>				

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# INTERNATIONAL SEARCH REPORT

In. ational Application No

PCT/GB 99/04248

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B29/00 B21D17/04 B21D39/04

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)

IPC 7 E21B B21D

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)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 997 320 A (HWANG BIING-YIH) 5 March 1991 (1991-03-05) abstract; figures 8,9 ---	1-3,6,7, 9,11
X	US 3 820 370 A (DUFFY E) 28 June 1974 (1974-06-28) column 4, line 29-47; figures 1-7 ---	1-3,6,7, 9,11
A	US 3 191 677 A (M. M. KINLEY) 29 June 1965 (1965-06-29) the whole document ---	12
A	US 2 627 891 A (P.B. CLARK) 10 February 1953 (1953-02-10) the whole document ---	12
	-/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

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"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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"&" document member of the same patent family

Date of the actual completion of the international search

19 April 2000

Date of mailing of the international search report

16. 06. 2000

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04248

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

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 807 704 A (HSU FRANK H ET AL) 28 February 1989 (1989-02-28) figure 2	12
X	US 3 977 076 A (VIEIRA MANUEL ET AL) 31 August 1976 (1976-08-31) column 7, paragraph 3 figures 1-6	30,31

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 99/04248

### 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.:

#### 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: 1-11

A method of forming a profile in a section of tubing by deforming the tubing with a radially extendable expander member,

2. Claims: 12-29

A method of placing a ring of deformable material in a section of tubing,

3. Claims: 30-31

A method of cutting a section of tubing.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/04248

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4997320	A	05-03-1991	NONE	
US 3820370	A	28-06-1974	NONE	
US 3191677	A	29-06-1965	NONE	
US 2627891	A	10-02-1953	NONE	
US 4807704	A	28-02-1989	CA 1327036 A EP 0310215 A NO 884249 A	15-02-1994 05-04-1989 29-03-1989
US 3977076	A	31-08-1976	NONE	