METHOD AND APPARATUS FOR CURING LINERS IN LARGE DIAMETER PIPE

Abstract: An apparatus and method for repairing the juncture or intersection of a first conduit (15) and a second conduit (8) is disclosed. The apparatus includes a main body (1) for transporting and positioning a repair material impregnated with a heat curable resin system or matrix. An inflation device and caul plates carried by the main body position and compress the repair material against the intersection. This includes a portion of the interior of the second conduit and flange portion in the first conduit. The inflation device and caul plates include conductive fibers that are electrically resistively heated to effect curing of the resin in the repair material. Additionally, a method and liner apparatus for the in-situ repair of conduits having large diameters is disclosed. The liner comprising a plurality of discrete heating zones, where each zone impregnated with a curable resin.
(88) Date of publication of the international search report:
21 February 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F16L55/165 F16L55/16

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 F16L

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

<table>
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<tr>
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<th>Relevant to claim No.</th>
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<td>X</td>
<td>FR 2 542 416 A (VERNHE FREDERIC) 14 September 1984 (1984-09-14) abstract page 1, line 30 -page 2, line 2 page 3, line 30 -page 4, line 41 claims 1-5,11 figures 4,5 page 6, line 2 - line 4</td>
<td>1,3, 10-12,48</td>
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<td>X</td>
<td>US 5 010 440 A (ENDO MAMIKO) 23 April 1991 (1991-04-23) the whole document</td>
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

Date of the actual completion of the international search: 10 May 2001

Date of mailing of the international search report: 14.09.2001

**Special categories of cited documents:**

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Authorized officer: Schaeffler, C.
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<td>US 5 451 284 A (IKEDA SHINTARO ET AL) 19 September 1995 (1995-09-19) abstract figures 18, 22, 23 column 2, line 8 - line 31 column 9, line 53 - column 10, line 16 claim 1</td>
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INTERNATIONAL SEARCH REPORT

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:

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.:

   1-57

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (1)) (July 1998)
1. Claims: 1-57

Method and apparatus for repairing pipes or pipe intersections by an internal liner.

2. Claims: 58-69

Method of forming a composite pipe
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<td>FR 2542416 A</td>
<td>14-09-1984</td>
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