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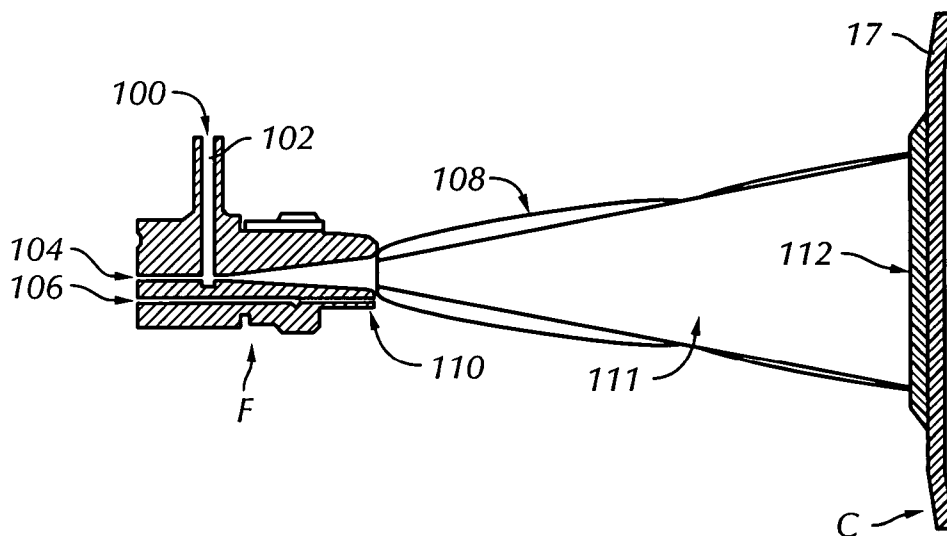
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Published:

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- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
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24 July 2008

(54) Title: IMPROVED PROTECTIVE SLEEVE FOR PIPE JOINT INFILL CLADDING



(57) Abstract: A protective sleeve is applied as a permanent outer cladding shield over a joint infill at the welded end portions of adjacent coated sections of pipe for a pipeline in a body of water. The sleeve takes the form of a sheet of synthetic resin mounted to form a cylinder about the area to receive the joint infill. An electrically conductive mesh or wire element mounted with the sheet is provided with electrical current to fuse circumferential portions of the sleeve to the weight-coated cover sections of the pipe and to fuse longitudinal portions of the sleeve together.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/21519

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F16L 47/00, 53/00 (2008.04)

USPC - 285/294.2

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(8)- F16L 47/00, 53/00 (2008 04)

USPC: 285/294.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC: 285/294.2, 294.1, 41, 55 (see search terms)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO -West -DB- PGPB, USPT, EPAB, JPAB

Search terms- pipe, sleeve, sheet, seal, stub, coating, spraying, flame, epoxy, polyurethane, welded, resin, weight, insulating, joint, conductive, electrical and heat, clamp, pipe, sleeve, joint, welded, synthetic resin, seam, droplets, heat, holding, sealing, coating and band

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,049,296 A (HARRISON) 20 September 1977 (20.09 1977), figure 1-5, column 2, line 45 to column 5, line 11.	2 1
Y	US 4,147,381 A (SCHWARZ) 03 April 1979 (03.04.1979), figure 1-6, column 1, line 45 to column 5, line 9	1-3, 4A, 4B, 5A, 5B, 6A, 6B and 7-20
Y	US 4,958,857 A (SIXSMITH) 25 September 1990 (25 09 1990), figure 1-4, column 2, line 33 to column 6, line 27.	1-3, 4A, 4B, 5A, 5B, 6A, 6B and 7-20
Y	US 4,808,031 A (BAKER) 28 February 1989 (28 02 1989), figure 1-6; column 2, line 34 to column 4, line 54	6A, 6B and 10-20

☐ Further documents are listed in the continuation of Box C.
D

* 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 application or patent but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"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

21 April 2008 (21.04 2008)

Date of mailing of the international search report

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Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/21519

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:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group I: claims 1-3, 4A, 5A, 6A, 4B, 5B, 6B and 7-20 are directed to a method of applying protective cladding over welded end stubs of coated sections of pipe for a pipeline, comprising: applying a sheet of synthetic resin with an electrically conductive element to form a cylindrical sleeve about the welded end portions and overlapping onto portions of the coated pipe sections adjacent the end stubs; introducing components into the interior of the cylindrical sleeve to allow a synthetic resin to form and fill the interior of the sleeve as joint infill between the adjacent pipe sections; sending electrical current into the conductive element to heat adjacent portions of the sleeve to bond together and seal the sleeve over the joint infill; and spraying a resin onto bonded / overlapping portions of sleeve and the portions of the coated pipe sections to further seal the sleeve over the pipe joint.

— Continued in Extra 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 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.

Box III/2

Group II claim 21 is directed to a clamp for holding a heat fusible protective cladding sleeve in sealing contact on a protective cladding sleeve as a coating of synthetic droplets is being applied to seams of the protective cladding sleeve and a pipe joint of welded end portions of adjacent synthetic resin coated sections of the pipe, comprising a clamp band fitting circumferentially over portions of the cladding sleeve leaving a longitudinal seam between overlapping longitudinal edges of the cladding sleeve accessible to the droplets, the clamp band having circumferentially spaced end portions defining a gap to allow the applicator clamp to be brought into position over the cladding sleeve on the pipeline, the clamp band extending along the length of the cladding sleeve between end seams formed extending longitudinally between end portions of the cladding sleeve and the adjacent synthetic resin coated sections of the pipe, and a mounting mechanism for bringing the clamp band into sealing contact with the cladding sleeve

Groups I and II do not relate to a single general inventive concept under PCT Rule 13 1 because under PCT Rule 13 2 they lack the same or corresponding technical features for the following reasons

Group II does not include the inventive concept of applying a sheet of synthetic resin with an electrically conductive element to form a cylindrical sleeve, introducing components into the interior of the cylindrical sleeve, sending electrical current into the conductive element to heat adjacent portions of the sleeve to bond together and seal the sleeve over the joint infill of Group I

Group I does not include the inventive concept a clamp comprising a clamp band over portions of the cladding sleeve leaving a longitudinal seam between overlapping longitudinal edges of the cladding sleeve accessible to the droplets the clamp band having circumferentially spaced end portions defining a gap to allow the applicator clamp to be brought into position over the cladding sleeve on the pipeline, the clamp band extending along the length of the cladding sleeve between end seams, and a clamp mounting mechanism of Group II

Thus, the inventions identified as Groups I and II lack unity of invention under PCT Rule 13 because they do not share a same or corresponding special technical feature