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(71) Applicant *(for all designated States except US)*: UPONOR ALDYL LIMITED [GB/GB]; Hilcote Plant, P.O. Box 1, Blackwell, Nr. Alfreton, Derbyshire DE55 5JD (GB).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)* : HARRISON, Gordon [GB/GB]; 131 Ball Hill, Derbyshire DE55 2EB (GB). LEES, George, Albert [GB/GB]; 10 Crossdale Drive, Keyworth, Nottingham NG12 5HP (GB). STENNER, Nigel, Wayne [GB/GB]; Milford Lea, 4 Aston Lane, Shardlow, Derbyshire DE7 2GX (GB).

(74) Agent: HALL, Robert, Leonard; Dibb Lupton Broomhead, Fountain Precinct, Balm Green, Sheffield S1 1RZ (GB).

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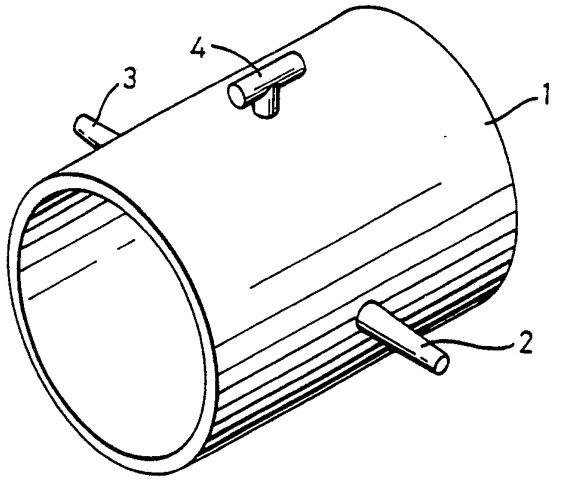
(54) Title: ELONGATE HOLLOW MEMBER



(57) Abstract

An elongate hollow member (1) having at least one open end, the hollow member being a pipe, a sleeve, a pipe fitting, or a connecting piece for a pipe, and having on its external surface means (2, 3, 4) for lifting, moving or rotating the hollow member by hand, which lifting, moving or rotating means comprises: a) at least one functional member secured to the hollow member or integrally moulded therewith, and extending outwardly therefrom, said functional member being shaped so that it can be gripped or held by hand; or b) at least one securing or mounting means adapted to co-operate and engage with a functional member so shaped that it can be gripped or held by hand; or c) at least one surface feature or indentation adapted to provide hand gripping means. The arrangement is such that the hollow member or pipe can be lifted, moved or rotated by hand using the functional member or hand gripping means, without touching the internal surface of the hollow member, and without passing the hands underneath the hollow member.

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ELONGATE HOLLOW MEMBER

This invention relates to elongate hollow members, and more particularly to elongate hollow members in the form of pipes and conduits, especially plastic pipes and pipe fittings.

Plastics pipes are now widely used in place of the more traditional earthenware and metal pipes for carrying fluids, for example, in the water, water treatment, and gas industries. Various fittings are used to join lengths of plastic pipe, of which thermoplastic heat-fusion pipe fittings are extremely popular. The designs for such fittings fall into three basic types. Firstly, those having an electric heating element which is embedded in the body of the fitting and located in close proximity to the surface of the fitting that is to be joined to the pipe by heat fusion. In the second type, the fitting may have a metal core embedded in the body thereof, in which eddy currents can be induced by the action of an induction coil thereby producing a heating effect in the core. Thirdly, there are those fittings which are intended to be heated by the application of an external heat source, for example, heat recoverable pipe fittings.

In recent years, both the pipes and the pipe fittings have become larger and more difficult to manoeuvre by hand. Once a pipe or pipe fitting becomes of such a size that it is too large for the hand to extend more than part way round the

circumference, it is necessary to use two hands to lift the pipe, either by passing the hands underneath the pipe, or by inserting the fingers into the ends of the pipe if the pipe length is short enough to do so. This situation pertains to most pipes and pipe fittings of an external diameter greater than about 180 mms.

Long lengths of plastic pipe are often laid in a trench, and joined using thermoplastic heat-fusion pipe fittings. It is frequently necessary to manhandle the pipe fitting, in order to locate the fitting in the correct position, by rotation, swivelling, and/or sliding the fitting into place. In addition, it is often necessary to turn the fitting in order to attach electrical connections to the heating element. In carrying out these operations, particularly under wet or muddy conditions, difficulties in manhandling the heavier, larger diameter pipes and pipe fittings are frequently experienced, and it is also not uncommon for the internal surface of the pipe fitting to become contaminated with mud from the trench. The present invention provides a pipe or pipe fitting which can be readily lifted, moved, rotated, or otherwise manhandled by hand thereby alleviating the difficulties hitherto experienced.

In one aspect, the present invention provides an elongate hollow member having at least one open end, the hollow member being a sleeve, a pipe fitting or a connecting piece for a pipe, and having on its external surface means for lifting,

moving, or rotating the hollow member by hand, which means comprises:-

(1) at least one functional member secured to the hollow member or integrally moulded therewith, and extending outwardly therefrom, said functional member being so shaped that it can be gripped or held by hand; or

(2) at least one securing or mounting means adapted to co-operate and engage with a functional member so as to secure or mount the functional member on the hollow member, the functional member being so shaped that it can be gripped or held by hand; or

(3) at least one surface feature or indentation on or in the hollow member adapted to provide hand gripping or holding means.

The arrangement being such that the hollow member can be lifted, moved or rotated by hand using the functional member without touching the internal surface of the hollow member and without passing the hands underneath the hollow member.

In this invention the functional member is preferably dedicated to its purpose, that is to say it preferably should not be associated with secondary functions such as, for example, making electrical connections, connections to another member, or passing a fluid into or out of said hollow member. The functional member may be subjected to quite severe mechanical stresses in use, and such secondary functions may well be hindered or damaged if associated therewith.

In another aspect, therefore, the invention provides a pipe with means to facilitate manhandling having secured thereto or integrally moulded therewith at least one member, at least a portion of the member extending outwards from the outer surface of the pipe, said member being shaped so that it can be gripped or held by the hand so as to be able to lift or move the pipe, and said member not being associated with electrical connections, not being adapted to be connected to another member, not being adapted to pass a fluid into or out of said pipe, and not being a strengthening member.

Although the invention may find application with elongate hollow members such as lightweight metal sleeves, pipe fittings and connecting pieces, for example those made of iron, copper or steel, it is particularly advantageous for use with plastics sleeves, pipe fittings and connecting pieces, for example, those made from plastics materials such as polyolefins, for example, polyethylene or polypropylene. Other suitable plastics materials are vinyl resins for example, polyvinylchloride; polystyrene; or acrylic resins. Preferably the plastics material is a thermoplastic material, or a cross-linked thermoplastic material, for example, cross linked polyethylene.

The invention is primarily applicable to relatively short hollow members, for example sleeves or fittings adapted for sliding over or into other pipes, or connecting pieces. However, the invention is applicable to any length of pipe

sleeve, pipe fitting or connecting piece and the longer the hollow member, the greater the number of functional members which is desirable. Thus the length of the hollow member may range from a few cms, say for example about 5 cms, to several metres, for example up to 3 metres. Preferably the length of the hollow member is from about 10 cms to about 60 cms. The invention finds particular application when the maximum diameter of the pipe is about 180 mms or greater, especially 250 mms or greater and particularly up to and including 315 mms or more, for example up to and including 400 mms.

The functional member may be secured to the hollow member, for example, by welding or fusion or may be integrally moulded to the hollow member. The integral moulding is especially suitable when the hollow member is made of plastics material and relatively short. In another embodiment, the functional member can be a separate item, having means for attachment to a boss or other mounting means moulded into the external surface of the hollow member.

In a preferred aspect of the invention, the functional member can take the form of a handle which is so shaped that it can be gripped or held by the hand so as to be able to lift or move the hollow member. Thus, one form of handle primarily designed for lifting the hollow member from one place to another is a T-shape member integrally moulded with or attached to the hollow member, for example, by means of a screw-threaded boss or similar mounting means so that the top of the T is spaced

from the hollow member. The top of the T can run substantially parallel to the axis of the hollow member, or at an angle thereto. Clearly, the "vertical" portion of the T will have to be long enough for the fingers of the hand to be able to be inserted between the "horizontal" portion of the T and the pipe. Another suitable form of handle would be a loop in which the fingers could be inserted, or a ball, disc or other suitable means to gain purchase.

Other forms of handle which are primarily intended to facilitate the manoeuvring of the hollow member as opposed to facilitating the lifting of the hollow member are simple rods extending outwards from the surface of the hollow member, ie, extending radially outwards if the hollow member is of circular cross-section. These rods may have indentations for the fingers, and may be slightly tapered if desired but these features are not essential. For lifting the hollow member, it will usually be necessary to provide two directly opposed rods, and if the pipe is circular, they can be diametrically opposed. However, one suitably shaped rod may be used in some cases, particularly where its function is mainly to facilitate rotation of the hollow member.

In a preferred construction, the elongate hollow member may comprise a pipe of circular section having a T-shaped handle and/or two diametrically opposed rods, which may be tapered handles.

In another embodiment, the hollow member is provided with a least one surface feature or indentation adapted to provide hand gripping means. The surface feature may be proud of the surface of the hollow member, for example, it may comprise corrugations, or a knurled region extending around the hollow member circumference. Alternatively, the hand gripping means may comprise indentations having recessed or under-cut portions into which the fingers can be inserted so as to grip the hollow member. In the latter embodiment the gripping means may be flush with the surface, which can provide an advantage in certain circumstances.

The functional member is preferably not associated with electrical connections, not adapted to be connected to another member, not adapted to pass a fluid into out of the pipe, and not a strengthening member. Thus, for example, the functional member preferably does not have an electrical cable inserted therein and is not a sleeve or chimney surrounding an electrical connection. Also, for example, it is preferably not adapted to be connected to other pipes or electrical cables, e.g. a flange, and it is preferably not a branch pipe whereby fluid would be able to leave or enter the pipe of the invention. Finally, the functional member is preferably not a strengthening member such as, for example, a tension-sustaining reinforcing member.

As previously mentioned, the invention is particularly adapted for use with thermoplastic heat-fusion pipe fitting systems which are used, for example, for joining lengths of thermoplastic or cross-linked plastic pipe. In these systems, the pipe fitting has a body portion adapted to accommodate plastic pipes at both ends. The pipe fitting has an electrical heating element which is embedded therein and which is connected to terminals outside the body portion, to which terminals electric power is supplied on installation. When the heating element is powered, the pipe fitting softens in the locality of the heating element and fuses the fitting to the pipes located in the ends of the body portion. Some fusion of the pipe surface may also occur when thermoplastic pipes such as, for example, polyethylene pipes are used, thus strengthening the bond. In an alternative embodiment, the pipe fitting may be provided with an adhesive on its internal surface, which is activated by heat from the heating element to melt and form a bond.

Preferably both the pipes to be joined and the hollow member of the invention are made from the same plastics material, most preferably a thermoplastic, for example, polyethylene.

The invention provides a great advance in easing the carrying or transporting of sleeves, pipe fittings and connecting pieces around a site, but there are also further advantages. It has been found that operators can handle a pipe fitting without gripping the internal (fused area) surface of the fitting,

thereby eliminating a potential source of contamination. Particularly for polyethylene pipes, the surfaces of which are glossy and slippery, it has been found that the presence of one or more functional members improves the ability of the operator to locate the fitting in the correct position by rotating, swivelling and/or sliding the fitting or coupling into place. Additionally it has been found that when the pipes are buried underground, the functional members which protrude from the pipe, provide additional anchorage against pipe displacement due to expansion and contraction of the system. They thus act as soil stress anchors along the pipeline.

An embodiment of the invention will now be described with reference to and as illustrated in figures 1 and 2 of the drawings in which

Figure 1. is a perspective view of a pipe fitting of the invention; and

Figure 2. shows in perspective the handling of the pipe fitting.

Referring to the figures, pipe fitting 1 is provided with two diametrically located, tapered handles 2 and 3. Also provided is a T-shaped handle 4, disposed on a radius transverse to the axis of the tapered handles.

From figure 2 the manoeuvring of the fitting over two pipes 5 and 6 is shown.

The reader's attention is directed to all papers and documents which are filed concurrently with this specification and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps or any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

CLAIMS

1. An elongate hollow member having at least one open end, the hollow member being a sleeve, a pipe fitting, or a connecting piece for a pipe, and having on its external surface means for lifting, moving or rotating the hollow member by hand, which lifting, moving or rotating means comprises:

(a) at least one functional member secured to the hollow member or integrally moulded therewith, and extending outwardly therefrom, said functional member being shaped so that it can be gripped or held by hand; or

(b) at least one securing or mounting means adapted to co-operate and engage with a functional member so shaped that it can be gripped or held by hand; or

(c) at least one surface feature or indentation adapted to provide hand gripping means.

The arrangement being such that the hollow member can be lifted, moved or rotated by hand using the functional member or hand gripping means, without touching the internal surface of the hollow member, and without passing the hands underneath the hollow member.

2. A pipe having secured thereto or integrally moulded therewith at least one member, at least a portion thereof extending outwards from the outer surface of the pipe, said member being shaped so that it can be gripped or held y the hand so as to be able to lift or move the pipe, and said member not being associated with electrical connections, not being adapted to be connected to another member and not being adapted to pass a fluid into or out of said pipe.

3. A pipe according to Claim 2 wherein the pipe is a sleeve, fitting or connecting piece.

4. An elongate hollow member or pipe according to any of the preceding claims, which is made of thermoplastic material, preferably polyethylene.

5. An elongate hollow member or pipe according to any of the preceeding claims, having a length of from 10 cms to 60 cms and a diameter of from 180 mms to 400 mms.

6. An elongate hollow member or pipe according to any of the preceding claims, which has a circular cross-section and has a T-shaped handle and/or two diametrically opposed tapered handles.

7. An elongate hollow member or pipe according to any of the preceeding claims, that comprises a heat-fusion pipe fitting.

8. An elongate hollow member or pipe according to claim 1 or 2 substantially as hereinbefore described with reference to the accompanying drawings.

9. The manhandling of an elongate hollow member having at least one open end, the hollow member being a sleeve, a pipe fitting, or a connecting piece for a pipe, and having on its external surface means for lifting, moving or rotating the hollow member by hand, which lifting, moving or rotating means comprises:

(a) at least one functional member secured to the hollow member or integrally moulded therewith, and extending outwardly therefrom, said functional member being shaped so that it can be gripped or held by hand; or

(b) at least one securing or mounting means adapted to co-operate and engage with a functional member so shaped that it can be gripped or held by hand; or

(c) at least one surface feature or indentation adapted to provide hand gripping means.

The arrangement being such that the hollow member can be lifted, moved or rotated by hand using the functional member or hand gripping means, without touching the internal surface of the hollow member, and without passing the hands underneath the hollow member.

10. The manhandling of a pipe wherein the pipe has secured thereto or integrally moulded therewith at least one member, at least a portion of the member extending outwards from the outer surface of the pipe, said member being shaped so that it can be gripped or held by the hand so as to be able to lift or move the pipe.

11. The lifting or moving of an elongate hollow member or pipe according to claims 7 or 8 wherein the pipe is as claimed in any one of claims 1 to 6.

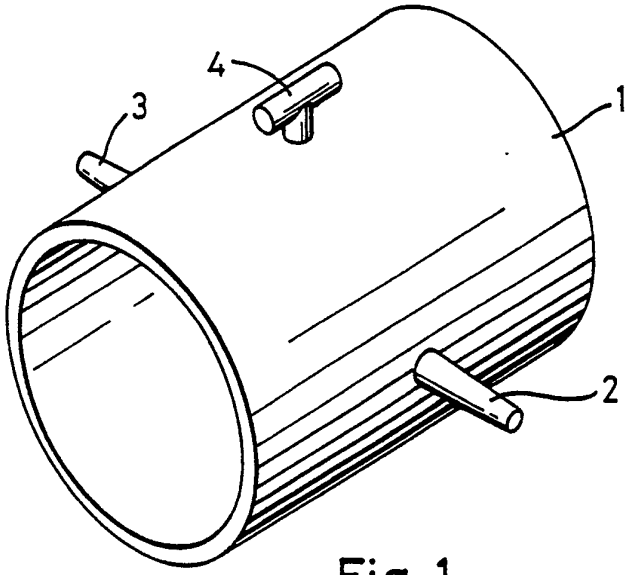

Fig. 1

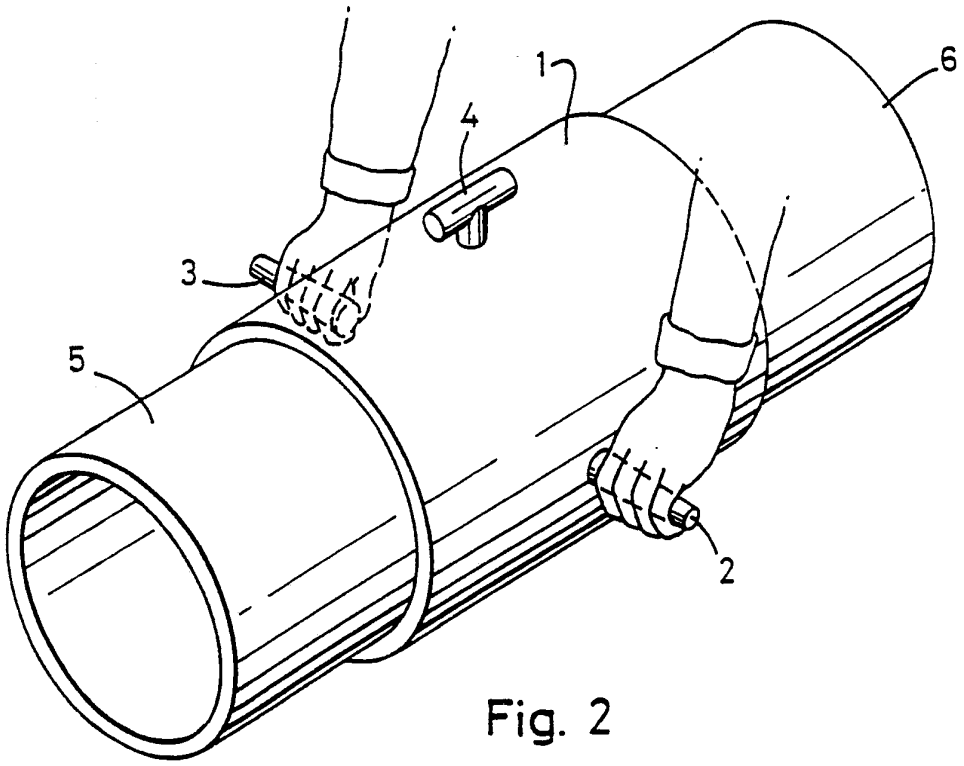

Fig. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 92/00965

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 F16L1/08; F16L1/06; B65G7/12

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	F16L ; B65G ; B25B

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X	US,A,4 723 800 (SANDERS) 9 February 1988 see abstract; figures see column 3, line 22 - column 2, line 26	1-3,8-11
A		6

X	US,A,4 697 830 (WOOD ET AL.) 6 October 1987 see abstract; figures	1-4,8-11
A		6

X	US,A,2 749 173 (PETERSON) 5 June 1956 see column 1, line 67 - column 2, line 2; figures see column 2, line 57 - column 2, line 72	1-3,8-11
A		6

X	US,A,4 915 422 (CHACON ET AL.) 10 April 1990 see abstract; figures	1,8,9,11
A		3,6,10

° Special categories of cited documents :[10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
20 AUGUST 1992	01. 09. 92
International Searching Authority	**Signature of Authorized Officer**
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 9200965 SA 60013

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 20/08/92
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4723800	09-02-88	None	
US-A-4697830	06-10-87	None	
US-A-2749173		None	
US-A-4915422	10-04-90	None	