

PATENT SPECIFICATION (11)

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- (21) Application No. 15928/74 (22) Filed 10 April 1974 (19)
 (31) Convention Application No. 351 742 (32) Filed 16 April 1973 in
 (33) United States of America (US)
 (44) Complete Specification published 5 May 1976
 (51) INT. CL.³ F16L 47/00
 (52) Index at acceptance
 F2G 24B2 24B5 2J
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(54) PIPE COUPLINGS

(71) We, AMP INCORPORATED, a corporation organised and existing under the laws of the State of New Jersey, United States of America, of Eisenhower Boulevard, Harrisburg, State of Pennsylvania, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to pipe couplings for interconnecting the adjacent ends of two plastics pipes.

According to the present invention a pipe coupling for interconnecting the adjacent ends of two plastics pipes comprises a pair of rigid tubular inserts each having a flange at one end and adapted to be received in a pipe end so that the flange protrudes from the pipe end, means for maintaining the flanges in abutting relationship, a tubular member deformable at portions adjacent each end and adapted to encompass the pipe ends and a pair of rigid sleeves, each sleeve being received slidably over an individual end of the tubular member so that the deformable portions are radially compressed thereby compressing the pipe ends between the tubular member and the respective inserts.

An embodiment of the invention will now be described, by way of example, reference being made to the Figures of the accompanying diagrammatic drawings in which:—

Figure 1 is an exploded, partially sectional, perspective view of a pipe coupling;

Figure 2 is a cross-sectional view of the pipe coupling of Figure 1 connecting together two pipe ends;

Figure 3 is a perspective view of a collar; and

Figure 4 is a perspective view of the pipe coupling of Figures 1 and 2 using the collar of Figure 3.

As shown in Figures 1 and 2 a pipe coupling for interconnecting the adjacent ends 52, 52¹ of two plastics pipes 50, 50¹ comprises a pair of rigid tubular inserts 10, 10¹,

a pair of semi-circular clips 22, 22¹, one deformable tubular member 26 and a pair of rigid sleeves 40, 40¹. As each of the elements of the pipe coupling constituting a pair are substantially identical, one reference numeral assigned to each feature on one element will apply to the same feature on the other element but to distinguish one element from the other, the reference numerals on one will include a "prime" mark.

Each tubular insert 10, 10¹ made, for example, from steel has a body 11, 11¹ having a flange 16, 16¹ at one end. The body 11, 11¹ is adapted to be received snugly in a pipe end 52, 52¹ so that the flange 16, 16¹ protrudes from the pipe end (see Figure 2). A portion 18, 18¹ of the outer surface of the body 11, 11¹ is formed with serrations 19, 19¹.

Means for maintaining the flanges 16, 16¹ in abutting relationship comprises the pair of semi-circular clips 22, 22¹. Each clip 22, 22¹ has a groove 24, 24¹ on its inside surface adapted to receive a portion of a flange 16, 16¹. The clips 22, 22¹ are made of rigid material such as steel.

The tubular member 26 is made of a deformable plastics material which is preferably transparent and includes on its outer surface a pair of spaced ribs 30 defining an annular centre section 28. Between each end 32 and the adjacent rib 30 are a plurality of serrations 36. At each end 32 is a rim 34. Each rim 34 and each serration 36 has a bevelled side facing towards its respective end 32 and a perpendicular side facing towards the centre section 28. The tops of the serrations 36 are flat.

Each sleeve 40, 40¹ is made, for example, from steel and has a flange 44, 44¹ at one end. Each sleeve 40, 40¹ is an interference fit on the serrations 36 of the tubular member 26.

In use, the ends 52, 52¹ of the pipes 50, 50¹ are prepared by squaring them off. The pipes 50, 50¹ are then displaced laterally with respect to each other to obtain access to each pipe end 52, 52¹. The sleeves 40, 40¹ are then threaded over respective pipe

ends 52, 52¹. Next, the tubular member 26 is threaded over one pipe end 52 or 52¹. The tubular inserts 10, 10¹ are next inserted into their respective pipe ends 52, 52¹ so that the pipes 50, 50¹ at least cover the portions 18, 18¹ with the ends 52, 52¹ spaced from their respective flanges 16, 16¹. The pipes 50, 50¹ are now brought back into axial alignment. If necessary, the tubular inserts 10, 10¹ may be moved longitudinally within their pipes 50, 50¹ so that the flanges 16, 16¹ abut. The clips 22, 22¹ are slipped over the flanges 16, 16¹ which are received in the grooves 24, 24¹. The grooves 24, 24¹ are dimensioned to maintain the flanges 16, 16¹ together in abutting relationship. The tubular member 26 is then slid over the pipe ends 52, 52¹ so as to encompass the pipe ends 52, 52¹ and the clips 22, 22¹, the centre section 28 substantially overlying the clips 22, 22¹. If the tubular member 26 is transparent the positioning will be simplified. In this position of the tubular member 26, the serrations 35 are in alignment with the corresponding serrations 19, 19¹. Finally, each sleeve 40, 40¹ is forced over its respective rim 34 on the tubular member 26 until the flange 44, 44¹ abuts a rib 30. Since the sleeves 40, 40¹ are in interference fit on their respective serrations 36, the serrations 36 will be deformed inwardly. The inward deformation of the serrations forces the plastics material of the pipes 50, 50¹ inwardly into interlocking engagement with the serrations 19, 19¹ of the tubular inserts 10, 10¹. As the rear end of the sleeves 40, 40¹ pass over their respective rims 34, 34¹ the rims spring back to their original position thereby locking the sleeves 40, 40¹ on the tubular member 26 between the rims and the ribs 30.

Although the tubular member 26 described above is made completely of deformable material, it is envisaged that the portions only of the tubular member adjacent each end 32, in which portion the serrations 36 are formed, need be made of deformable material.

Referring now to Figures 3 and 4, a collar 82 of polyethylene and having a width slightly less than the width of the centre section 28 can be mounted on the tubular

member 26. The collar 82 is placed around the centre section 28 and tightened until a hole 90 in an ear 84 at one end of the collar 82 is in alignment with holes 92 in spaced ears 86 on the opposite end of the collar. A pin 88 is passed through the holes 90, 92 locking the collar 82 in position.

An advantage of the pipe coupling described above is that it can be fitted to adjacent pipe ends without the necessity of moving the pipes longitudinally with respect to each other. When a pipe is buried in the earth it frequently cannot be moved longitudinally without digging out substantial amounts of earth. The use of the tubular inserts removes the necessity for moving the pipes longitudinally.

WHAT WE CLAIM IS:—

1. A pipe coupling for interconnecting the adjacent ends of two plastics pipes comprising a pair of rigid tubular inserts each having a flange at one end and adapted to be received in a pipe end so that the flange protrudes from the pipe end, means for maintaining the flanges in abutting relationship, a tubular member deformable at portions adjacent each end and adapted to encompass the pipe ends and a pair of rigid sleeves, each sleeve being received slidably over an individual end of the tubular member so that the deformable portions are radially compressed thereby compressing the pipe ends between the tubular member and the respective inserts.
2. A pipe coupling as claimed in claim 1, in which the maintaining means is a pair of substantially identical semi-circular clips each having a groove on its inside surface adapted to receive a portion of the flanges.
3. A pipe coupling as claimed in claim 1 or 2, in which a collar surrounds the tubular member at a position along its length in alignment with the maintaining means.
4. A pipe coupling for interconnecting the adjacent ends of two plastics pipes, constructed and arranged substantially as described, with reference to and as illustrated in Figures 1 and 2 or Figure 4 of the accompanying drawings.

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member 26. The collar 82 is placed around the centre section 28 and tightened until a hole 90 in an ear 84 at one end of the collar 82 is in alignment with holes 92 in spaced ears 86 on the opposite end of the collar. A pin 88 is passed through the holes 90, 92 locking the collar 82 in position.

An advantage of the pipe coupling described above is that it can be fitted to adjacent pipe ends without the necessity of moving the pipes longitudinally with respect to each other. When a pipe is buried in the earth it frequently cannot be moved longitudinally without digging out substantial amounts of earth. The use of the tubular inserts removes the necessity for moving the pipes longitudinally.

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