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(54) A coupling for a pipe

(57) A pipe coupling consists of male and female tubular members 1 and 2 and an interposed double-lipped seal 3. The male member 1 has axially extending tongues 4 which are deformed radially inwardly when inserted into an annular recess 10 in the female member 2. The female member 2 has an outer wall provided with strengthening fins 12 and an inner wall provided with tongues which are internally thickened to define tapered serrated jaws 6. When a pipe is inserted into the member 2, the jaws 6 are expanded radially outwardly until the latter engage the tongues 4 so that double taper interlock occurs between the tongues so as to hold the members 1 and 2 firmly together without the need for a screw connection between the parts. The double-lipped seal 3 provides a good water-tight seal.

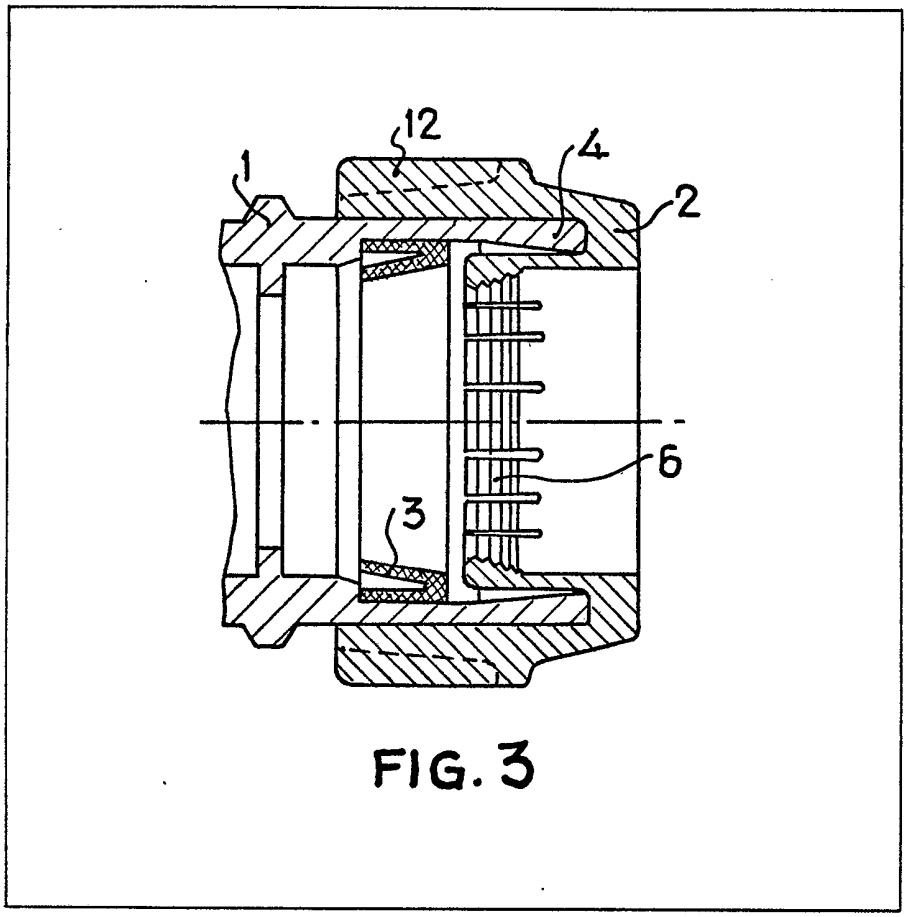

FIG. 3

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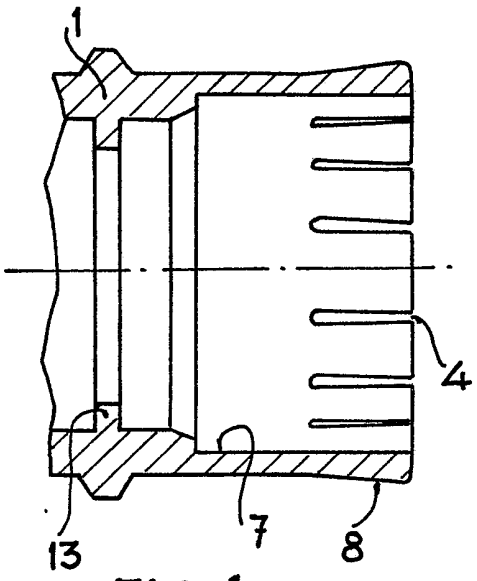

FIG. 1

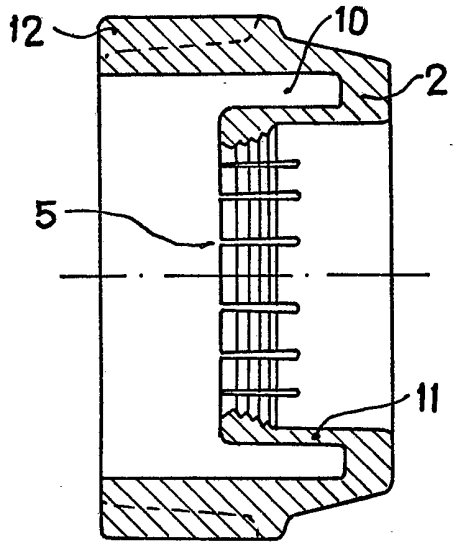

FIG. 2

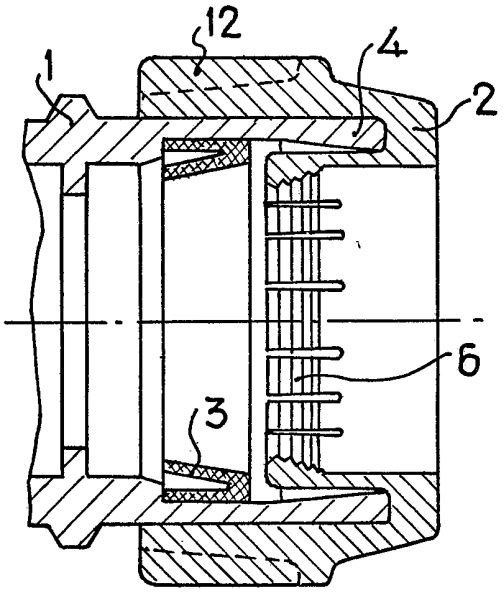

FIG. 3

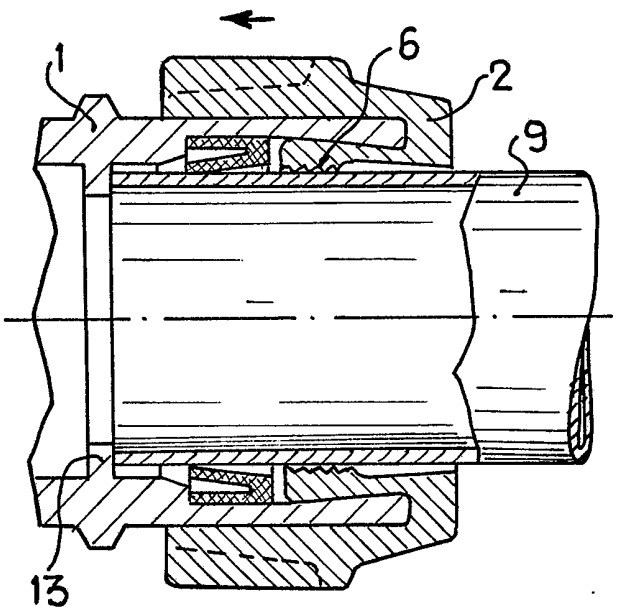

FIG. 4

SPECIFICATION

A coupling for a pipe

This invention relates to a coupling for a pipe, preferably for a plastics pipe.

An object of the present invention is to provide a coupling which enables rapid connection of two pipes.

According to the present invention there is provided a coupling for a pipe, comprising a male and a female tubular member which are axially interconnectible by interlocking, and an interposing double-lipped seal, the female member receiving the end of a pipe in use and having a portion which is expanded upon insertion of the pipe to interlock with the male member, thus producing a seal which is the greater the higher the service pressure.

The coupling is particularly suitable for incorporation in lengths of hose pipe and other installations likely to change direction and is characterised especially by the facility of fitting and its high degree of safety in use, in spite of its simplicity.

The double-lipped flexible seal serves to ensure a good seal in the coupling.

The two tubular members which unlike known devices do not have any thread, can be assembled by plugging one into the other by simple hand pressure, the assembly thus formed being used as a coupling because all it needs is to plug the pipe into the necessary for this to operate as soon as there is service pressure.

Inside one of the pieces, designed to receive the pipe axially when connected, there is an annular space for housing the seal which, instead of being toric as in other systems, is double-lipped so that fitting the pipe is easy and there in no need to bevel its end.

Fitting and disconnecting the coupling is done manually, forming a perfectly watertight coupling, capable of withstanding pressures greater than 10 kg/cm^2 without such pressure forcing the tubular members apart.

An embodiment of the present invention will now be described by way of example, with reference to the accompanying drawings, in which:—

Figure 1, is an axial section of part of a male tubular member forming part of a coupling according to the present invention,

Figure 2 is an axial section of a female tubular member of the coupling,

Figure 3 is an axial section of the male and female members of figure 1 and 2 assembled together with a double-lipped seal to form the coupling, and

Figure 4 is an axial section of the coupling shown fitted on a pipe, but without any water pressure acting on the coupling.

Referring now to the drawings, the coupling basically consists of a male tubular member 1, a female tubular member 2, and a double-lipped seal 3 which is interposed between the members 1 and 2, the coupling being assembled by hand pressure, thus obtaining a perfect seal in service.

The members 1 and 2 are essentially cylindrical and join together axially, as shown in figure 3.

One axial end portion of the male member (figure 1) is defined by a series of tongues 4, provided by a series of slots extending axially and diametrically into the member 1. This axial end portion has an outwardly divergent outer surface 8. Internally the male member 1 has a step 7 against which the double-lipped seal 3 is engaged with the lips of the seal facing away from the axial end of the member which has the outer surface 8 and which receives a pipe 9 (figure 4). Because of this orientation of the seal 3, the pipe 9 can be easily fitted into the member 1 so that its end abuts against an internal annular should 13 which serves as a stop for the pipe 9.

The female member (Figure 2) has an internal annular recess 10, defined between an internal cylindrical wall 11 and an outer wall of the member 2. The wall 12 is provided with several fins 12 which strengthen it to prevent deformation. Axially extending slots in the internal wall 11, define a plurality of tongues 5. The tongues 5 are inwardly thickened to form serrated jaws which are divergent in the direction of the end of the member 2 which is to receive the pipe 9.

The tongues 4 and 5 provide a relative flexibitity to the respective ends of the member 1 and wall 11 so that when the member 1 is inserted into the member 2 (figure 3) the tongues 4 of the male member 1 enter the annular recess 10 in the female member 2 and are thereby urged radially inwardly by the outer wall of the female member 2. The fins 12 prevent the outer wall from expanding radially and so the tongues 4 are inwardly deformed so that an internal inward taper is created, said inward taper being in the direction of said axial end of the member 1.

It will be appreciated from the above that the uncompressed outer diameter of the end of the member 1 defined by the tongues 4 is greater than the inner diameter of the outer wall of the member 2 and thus greater than the outer diameter of the recess 10. The tongues 4 are longer than the tongues 5. The tongues 4 and 5 form an integral part of the respective members 1 and 2.

Of course, before members 1 and 2 are connected together, the double-lipped sealing 3 has been inserted into the member 1 until the outer lip of the seal 3 has engaged against the bottom of the step 7 as shown in figure 3.

Once the two members 1 and 2 have been assembled, the end of pipe 9 is introduced until it seats against stop 13 (figure 4). Insertion of the pipe 9 causes the jaws 6 and thereby the tongues 5 of which they form part, to be urged outwardly as permitted by the flexibility thereof, created by the notches in the said tongues 5, so that the tongues 5 make surface contact with the inwardly tapering internal surfaces of the tongures 4. An effective pressure is established against tongues 4 of the male member 1 contained in the recess 10,

causing the two members 1 and 2 to be virtually inseparable so long as pipe 9 is not removed because of the interlocking double taper provided between the tongues 4 and 5. The watertightness of the assembly is guaranteed and supplemented by the double-lipped seal 3.

It must be emphasized that the arrangement as shown in Figure 4 is that which exists before water pressure acts on the pipe 9. When water pressure exists, a slight outward axial shifting of the pipe 9 occurs, thus causing it to pull on the female member 2 to produce a perfect fit and interlocking with the tongues 4 of male member 1.

Because of the effect of water pressure, it is necessary, when dismantling the coupling, to move the female member 2 back to its initial position in order to free the pipe 9 from the pressure which the interlocking exerts on it.

Consequently, for the pipe to be removed, there must be no pressure in it, since the greater the pressure therein, the greater the coupling pressure.

CLAIMS

1. A coupling for a pipe, comprising a male and female tubular member which are axially interconnectible by interlocking, and an interposing double-lipped seal, the female member receiving the end of a pipe in use and having a portion which is expanded upon insertion of the pipe to interlock the male member, thus producing a seal which is the greater the higher the service pressure.

2. A coupling as claimed in claim 1, wherein the male member has, at an end thereof to be engaged with the female member, a series of axially extending tongues which present an outer surface which diverges towards said end in an unassembled condition.

3. A coupling as claimed in claim 1 or 2, wherein the male member has an internal step against which the double-lipped seal seats, and in internal projection which limits insertion of the pipe in use.

4. A coupling as claimed in claim 2 or claim 3 when appending to claim 2 wherein the female member has an internal annular recess defined by an outer wall and an inner wall, the annular recess receiving the tongues of the male member upon assembly, and wherein the inner wall has a series of tongues which are internally thickened to provide tapered jaws so that, when the pipe is inserted into the pre-assembled male and female members, the tongues of the inner wall expand against the tongues of the male member to provide the interlock.

5. A coupling as claimed in claim 4, wherein the jaws are ribbed.

6. A coupling for a pipe, substantially as hereinbefore described with reference to the accompanying drawings.

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