

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Pipe Joints

We, HUMBS LIMITED, a Company incorporated under the laws of the State of Victoria, of Hume House, 185 William Street, Melbourne, in the State of Victoria, Commonwealth of Australia, 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 joints particularly to joints for concrete pipes constructed from pipe sections having faucets and spigots, the pipe sections being joined to form the pipe by fitting the faucet on one section around the spigot on the next adjacent section. To render the pipe fluid tight a resilient ring composed of rubber or other resilient material is inserted between the faucet and spigot in each joint and compressed therebetween.

Two main types of joints of the kind indicated are already well known.

In the first type of joint a resilient ring commonly called a 'rolling O-ring' is used. To form the joint the ring is placed around the end of the spigot and the faucet of the adjacent section is fitted over the spigot and the ring. As the pipe sections are pushed together the ring will roll along the faucet and spigot surfaces and when the sections are finally in position the ring will render the joint fluid tight even if one section is deflected with respect to the adjacent section. This type of joint is not completely satisfactory, however, as it is difficult to make the ring roll when joining pipe sections under wet conditions. Furthermore it is necessary to use relatively long and thick faucets and spigots because, in addition to the length necessary to make the joints fluid tight when one section is to be deflected with respect to the adjacent section additional length is required for the ring to be rolled thus unduly increasing the cost of producing the pipe sections.

In the second type of joint a resilient ring commonly called a 'skid' ring is used. To form

the joint the ring is held in position on the spigot and when the faucet of the adjacent section is fitted over the spigot the faucet will slide or 'skid' into position on the ring. This type of joint has the advantage that it can be made under wet conditions and that relatively short and thin faucets and spigots can be used. However as compared with the 'rolling O-ring' type of joint greater forces are required to slide or skid the faucet over the ring consequently the ring must be of a size in cross section which will permit it to be easily compressed and the faucet and spigot must be produced to a greater accuracy than in the 'rolling O-ring' type of joint (The force required to effect such a joint is proportional to the compression of the ring. As a certain minimum compression is necessary to obtain a fluid tight seal the maximum gap between the faucet and spigot must be controlled during manufacture of the pipe sections. The minimum gap between the faucet and spigot is then governed by the tolerance allowed on the joint dimensions and, as this tolerance increases, so does the maximum compression and the maximum jointing force).

The manufacture of joint dimensions to accurate tolerances is costly involving either more expensive plant or a subsequent 'repair' operation. Furthermore the ring must be prevented from moving on the spigot if the joint opens or deflects either by attaching it to the spigot with an adhesive, an operation which is costly and complicates laying of the pipe in the field or by forming a circumferential recess on the spigot to receive the ring, an operation which complicates the manufacture of the pipe sections.

The present invention is concerned with a joint of the 'skid' type and has for its primary object to overcome or minimize the disadvantages above referred to in relation to joints of this kind.

According to the invention a faucet and spigot joint of the 'skid' type for joining sec-

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tions of a concrete pipe, the joint having a resilient ring inserted between the faucet and spigot and compressed therebetween to form a substantially fluid tight joint, is characterized in that a circumferential groove is formed in the surface of the resilient ring facing the external surface of the spigot and that a circumferential ridge which is complementary to the groove in the ring is formed on the external surface of the spigot, the ridge fitting into the groove to restrain the ring from shifting along the spigot when the spigot is inserted in the faucet to form the faucet and spigot joint.

The compression characteristics of a resilient ring with a circumferential groove allow it to be easily compressed and hence allow greater manufacturing tolerances for the spigot and faucet. The circumferential ridge on the spigot, being small, is manufactured without additional or complicated process in either one piece or two piece moulds, the opening of the mould seam(s) allowing the mould to be removed without interfering with the ridge. Thus the above mentioned disadvantages of the 'skid' type joint are overcome or minimised by this invention.

In order that the invention may be readily understood reference is made to the accompanying drawings in which:—

Figure 1 is a view in longitudinal section of sections of concrete pipes,

Figure 2 is a detail view of a faucet and spigot joint in accordance with the invention, and

Figure 3 is a view in cross section of a resilient ring used in the joint of Figure 2.

Referring to the drawings Figure 1 illustrates sections of concrete pipes having faucets 4 on one end and spigots 5 on the other end, the upper part of the figure illustrating an enlarged faucet and the lower part a 'within the wall' faucet. The choice of the types of faucet depends upon the wall thickness of the pipe.

A resilient ring 6 is inserted between the faucet 4 and spigot 5 and is compressed therebetween to form a substantially fluid type joint.

As illustrated in Figures 2 and 3 a circumferential groove 7 is formed in the surface of the resilient ring 6 facing the external surface of the spigot and a circumferential ridge 8 which is complementary to the groove 7 is formed on the external surface of the spigot.

In the embodiment illustrated in Figure 3 the resilient ring 6 has a flattened internal surface and the groove 7 is of uniform semi circular configuration in the cross section. Alternatively the resilient ring may have, apart from

the groove, a circular or other cross section.

The resilient ring preferably has an internal diameter in its unstretched condition less than the external diameter of the spigot.

In operation when a joint is to be effected between two pipe sections the resilient ring 6 is stretched slightly and placed around the spigot 5, the ridge 8 on the spigot being fitted into the groove 7 in the resilient ring 6. The faucet 4 is then pushed over the spigot 5, sliding over the resilient ring 6 and compressing it to form a fluid tight seal between the spigot 5 and the faucet 4. If the length of the faucet 4 is sufficient the joint can be partially opened without the resilient ring losing its compression. The pipe sections can then be deflected and thus a flexible joint is provided.

The groove 7 in the resilient ring 6 will permit the resilient ring to be easily compressed when the faucet 4 is slid into position around the spigot 5 over the resilient ring 6 thus much less force is required to slide or 'skid' the faucet 4 into position around the spigot 5 than that required with the known type of 'skid' joint and is comparable to that required to complete a 'rolling O-ring' joint. In addition it is not necessary to maintain extremely accurate tolerances in the manufacture of the pipe sections. The compression characteristics of the resilient ring are controlled to a certain extent by the ridge 8.

WHAT WE CLAIM IS:—

1. A faucet and spigot joint of the 'skid' type for joining sections of a concrete pipe, the joint having a resilient ring inserted between the faucet and spigot and compressed therebetween to form a substantially fluid tight joint, characterized in that a circumferential groove is formed in the surface of the resilient ring facing the external surface of the spigot and that a circumferential ridge which is complementary to the groove in the ring is formed on the external surface of the spigot, the ridge fitting into the groove to restrain the ring from shifting along the spigot when the spigot is inserted in the faucet to form the faucet and spigot joint.

2. A faucet and spigot joint according to claim 1, wherein the groove is of uniform semi circular configuration in cross section.

3. A faucet and spigot joint according to claim 1 or claim 2, wherein the ring has an internal diameter in its unstretched condition less than the external diameter of the spigot.

4. A faucet and spigot joint of the 'skid' type for joining sections of a concrete pipe substantially as described with reference to the accompanying drawings.



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2. A faucet and spigot joint according to claim 1, wherein the groove is of uniform semi circular configuration in cross section.

3. A faucet and spigot joint according to claim 1 or claim 2, wherein the ring has an internal diameter in its unstretched condition less than the external diameter of the spigot.

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R. G. C. JENKINS & CO.,
Chartered Patent Agents,
Chancery House,
53/64 Chancery Lane,
London, W.C.2.
Agents for the Applicants.

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