

TITLE

## IMPROVED PIPE JOINT SYSTEM ✓

FIELD OF THE INVENTION

5 The present invention relates to an improved pipe joint system and relates particularly, though not exclusively, to such a pipe joint system for UPVC pipe joints.

BACKGROUND TO THE INVENTION

10 Poly Vinyl Chloride (PVC) pipes and Ultraviolet Protected Poly Vinyl Chloride (UPVC) are now used extensively for plumbing of sewerage, drainage and water supply lines. The PVC and UPVC pipes come in a variety of grades and diameters in accordance with international standards such as SS 213:1979 and others. When a UPVC pipe is joined to a pipe fitting, for example underneath a wash basin, a conventional "male and female" method is employed, ie, the UPVC pipe is fitted into a female portion provided on the fitting and glued with  
15 a suitable solvent cement. With this conventional pipe joint method there is no way of checking that the pipe is fully inserted into the female portion after installation, since the UPVC material of the fitting is opaque. This problem may be overcome by using a pipe fitting made from transparent material, such as an acrylic resin, so that the end of the pipe is visible through the female portion of  
20 the fitting. Such transparent fittings are available in Japan. However, in practice pipe joints using such transparent fittings can be rather unsightly, particularly when the pipes are exposed to view.

If a pipe joint has been incorrectly installed it can lead to leakage at the pipe joint. Such leakage may not be immediately apparent but may occur over time.  
25 Incorrect installation, due to the pipe not being fully inserted into the fitting, may arise in the following circumstances:

- (i) when an unskilled worker is employed to do the plumbing;

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- (ii) when the pipe is not cut perpendicularly; and,
- (iii) when poor workmanship occurs resulting in a less-than-thorough job.

#### SUMMARY OF THE INVENTION

5 The present invention was developed with a view to providing an improved pipe joint system that facilitates visual checking for full pipe overlap at pipe joint areas.

Throughout this specification the term "comprising" is used inclusively, in the sense that there may be other features and/or steps included in the invention  
10 not expressly defined or comprehended in the features or steps subsequently defined or described. What such other features and/or steps may include will be apparent from the specification read as a whole.

According to the present invention there is provided an improved pipe joint system for joining a pipe to a pipe fitting, the system comprising:

15 providing a male portion on the pipe fitting, said male portion being adapted to slidably fit into an end of the pipe and having an end marking to provide a visual indication whether or not the male portion has been inserted into the end of the pipe to its full extent.

Preferably said male portion is of slightly reduced diameter relative to the  
20 remainder of the pipe fitting so that either side of the joint the internal diameter is substantially the same. Advantageously said end marking is formed with a short sleeve member having an inside diameter adapted to slidably fit over the end of the pipe whereby, in use, when the male portion has been inserted into the end of the pipe to its full extent said sleeve member will overlap the end of  
25 the pipe.

If desired, said male portion may be provided on the pipe and said pipe fitting will act as the female portion. However, it is preferred that the male portion be provided on the pipe fitting so that standard pipe can be employed with the modified pipe fitting.

5     **BRIEF DESCRIPTION OF THE DRAWINGS**

In order to facilitate a better understanding of the nature of the invention, a preferred embodiment of the improved pipe joint system will now be described in detail, by way of example only, with reference to the accompanying drawings, in which:

10     Figure 1 illustrates a conventional prior art pipe joint;

Figure 2(a) and (b) illustrate problems that occur with conventional prior art pipe joints;

Figure 3 illustrates a preferred embodiment of the improved pipe joint system according to the present invention; and,

15     Figure 4 illustrates the improved pipe joint system of Figure 3 when it has been incorrectly installed.

**DETAILED DESCRIPTION OF PREFERRED EMBODIMENT**

20     A conventional pipe joint 10 as illustrated in Figure 1 has the pipe 12 acting as a male portion fitting into a female portion 14 on the pipe fitting 16. Problems that can arise with incorrect installation of this type of conventional pipe joint are illustrated in Figures 2(a) and (b). In Figure 2(a), the pipe 12 has not been cut perpendicularly and therefore although one edge of the pipe has been inserted some distance into the female portion 14 of the fitting, at the opposite edge there is barely any overlap with the female portion 14 of the pipe fitting.

25     It is at the point of minimum overlap that leakage will most likely occur, particularly if either the pipe or fitting is subject to any movement or vibration.

On the other hand, Figure 2(b) illustrates another example of poor workmanship where the pipe 12 has been cut too short and has not been correctly inserted into the female portion 14 of the pipe fitting. Once again, due to minimum overlap there is a high probability of leakage at the pipe joint arising from incorrect  
5 installation. However, in both instances it is not possible to tell by a visual inspection that the pipe joint has been incorrectly installed. Hence, when building inspectors view the pipe joint, they have no way of verifying that the pipe 12 has been correctly inserted into the female portion 14 of the fitting 16.

In order to overcome this problem, an improved pipe joint system has been  
10 designed, a preferred embodiment of which is illustrated in Figure 3. In the improved pipe joint system 20 of Figure 3, a male portion 22 is provided on the pipe fitting 24. The male portion 22 is adapted to slidably fit into an end of the pipe 26 and has an end marking 28 to provide a visual indication whether or not the male portion 22 of the fitting has been inserted into the end of the pipe 26  
15 to its full extent. It will be appreciated that the end marking 28 extends around the full outer circumference of the pipe fitting 24, at the point where the male portion 22 ends and the pipe fitting 24 begins. In this embodiment, the male portion 22 is of slightly reduced diameter relative to the remainder of the pipe fitting 24 so that either side of the joint 20 the internal diameter is substantially  
20 the same.

Advantageously the end marking 28 is formed with a short sleeve member 30 having an inside diameter adapted to slidably fit over the end of the pipe 26. Hence, when the male portion 22 has been inserted into the end of the pipe 26 to its full extent, the sleeve member 30 will overlap the end of the pipe as shown  
25 in Figure 3. This overlap will provide a proper capping to the end of the pipe 26 for aesthetic purposes and will also provide an additional seal against leakage. However, it is to be understood that the main purpose of the end marking 28 is to provide a visual indication of the extent to which the male portion 22 has been inserted into the end of the pipe 26. For this purpose, the  
30 sleeve member 30 is not essential.

If the pipe 26 is not cut to the proper length or incorrectly installed at the pipe joint, it will be immediately evident as shown in Figure 4 due to the gap which is visible between the end of the pipe 26 and the sleeve member 30 of the end marking 28 on the pipe fitting. Thus the supervisor or building inspector can  
5 reject the installation and the potential problem with the pipe joint can be immediately rectified. All types of pipe fittings, eg. 3 or 4 way junctions, bends, etc, can adopt the improved pipe joint system to ensure proper pipe overlap and thereby reduce pipe leakages.

Now that a preferred embodiment of the improved pipe joint system has been  
10 described in detail, it will be apparent that the improved pipe joint system provides a number of advantages over the prior art, including the following:

- (a) it provides an easy way of visually checking that the pipe is fully inserted at the pipe joint;
- (b) it is of low cost requiring minimum modifications to existing  
15 moulds for pipe fittings;
- (c) it is simple to use and is installed using conventional plumbing techniques; and,
- (d) it does not interfere with the normal operation of the pipe.

Some variations or modifications may suggest themselves to persons skilled in  
20 the plumbing and building arts, in addition to those already described, without departing from the basic inventive concepts. All such variations and modifications are to be considered within the scope of the present invention, the nature of which is to be determined from the foregoing description and the appended claims.



CLAIMS

1. An improved pipe joint system for joining a pipe to a pipe fitting, the system comprising:  
  
providing a male portion on the pipe fitting, said male portion being adapted to slidably fit into an end of the pipe and having an end marking to provide a visual indication whether or not the male portion has been inserted into the end of the pipe to its full extent.
2. An improved pipe joint system as defined in claim 1, wherein said male portion is of slightly reduced diameter relative to the remainder of the pipe fitting so that either side of the joint the internal diameter is substantially the same.
3. An improved pipe joint system as defined in claim 1, wherein said end marking is formed with a short sleeve member having an inside diameter adapted to slidably fit over the end of the pipe whereby, in use, when the male portion has been inserted into the end of the pipe to its full extent said sleeve member will overlap the end of the pipe.
4. An improved pipe joint system as defined in claim 3, wherein said short sleeve member is between 0.5 to 2.0cm in length.
5. An improved pipe joint system as defined in claim 1, wherein the pipe and pipe fitting are both manufactured from UPVC.
6. An improved pipe joint system substantially as herein described with reference to and as illustrated in Figures 2 to 4 of the accompanying drawings.