SPOUT CONNECTOR APPARATUS

Filed April 14, 1969

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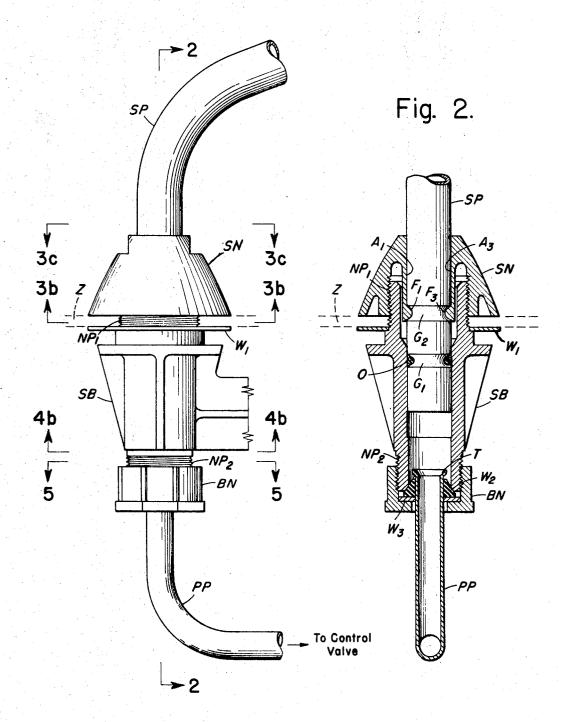


Fig. I.

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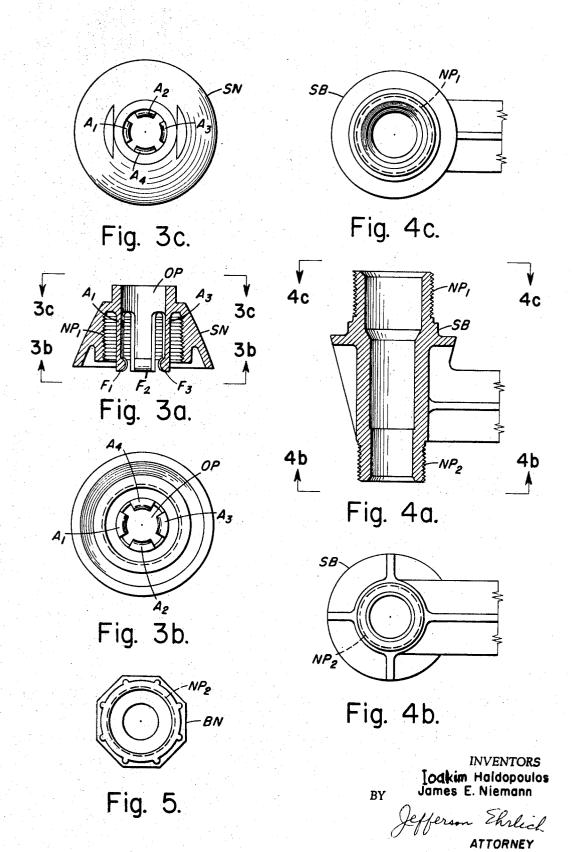
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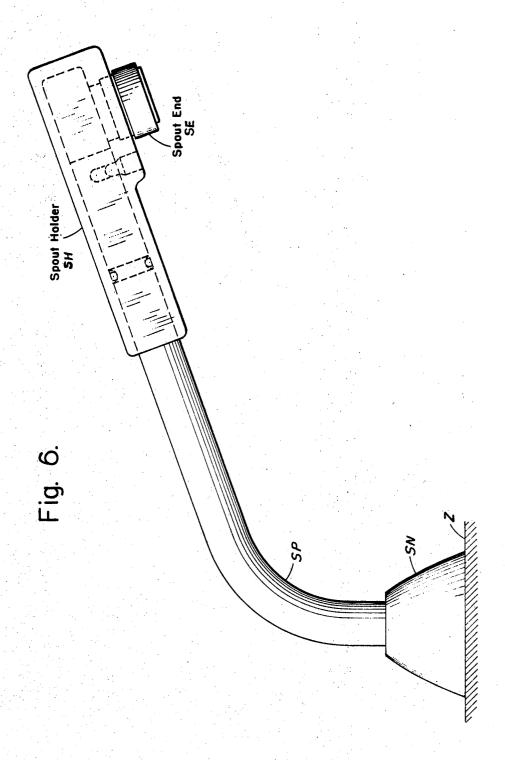
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SPOUT CONNECTOR APPARATUS

Filed April 14, 1969

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3,565,467 SPOUT CONNÉCTOR APPARATUS Ioakim Haldopoulos and James E. Niemann, Louisville, Ky., assignors to American Standard Inc., New York, N.Y., a corporation of Delaware
Filed Apr. 14, 1969, Ser. No. 815,982
Int. Cl. F161 5/00

U.S. Cl. 285-161

8 Claims

ABSTRACT OF THE DISCLOSURE

Covers an improved coupling arrangement for interconnecting fluid emitting spout mechanism to a plumbing fixture, such as a sink or lavatory, after the plumbing fixture has been otherwise installed in its assigned location. 15 The arrangement includes two inter-coupling members, i.e. a spout nut and a spout body, which are to be positioned on opposite sides of the deck of the plumbing fixture and are to be coupled to each other through the deck of the plumbing fixture so that they may not only grip the spout pipe on which the spout end may be assembled but also so that they may grip each other, and thereby prevent the spout pipe from being vertically movable with respect to the deck of the plumbing fixture, while permitting the spout pipe to be rotatable about the axis or centerline of the spout pipe. The spout nut has one or more arms with projecting fingers, and the spout pipe has a groove in its surface for receiving the project-

This invention relates to coupling mechanism for spout structures suitable for and employed with plumbing fixtures, such as sinks or lavatories or bathtubs or other fluid conveying fixtures. More particularly, this invention relates to improved apparatus for interconnecting a spout structure to a plumbing fixture by means of intercoupling devices positioned about the spout pipe in or near the region where the spout pipe enters the opening in the deck of the plumbing fixture.

In conventional sinks, lavatories and other plumbing fixtures, fluid conveying piping is first installed to connect an incoming city water supply pipe through other piping on the underside of the deck of the plumbing fixture so that spout equipment may later be afixed to the plumbing fixture by the use of a plumber's wrench, thereby connecting the spout device to the piping of the plumbing fixture. All of the piping and coupling mechanism is installed in advance so that a selected spout structure may be joined thereto at a later time.

According to the present invention, the coupling mechanism which includes a so-called spout escutcheon nut which is to be assembled upon the spout pipe on the upperside of the deck of the sink or other plumbing fixture, and a so-called spout body to be positioned on the lower side of the deck of the fixture, may be readily assembled on the plumbing fixture along with the spout end structure. The spout nut and the spout body are screw-threaded or otherwise coupled to each other so as to be joined to each other and at the same time prevent the spout pipe from being movable vertically, i.e., upwardly or downwardly, with respect to the deck of the plumbing fixture.

In the particular arrangement of equipment of this invention to be illustrated and described, the spout nut embodies a plurality of concentric parallel arms which are arranged to fit about the periphery of the spout pipe, and each such arm includes a finger or other protrusion which reaches toward the axis of the pipe so that the several fingers may be inserted into a groove circumferentially arranged about the surface of the pipe. The groove is designed to hold the fingers and yet permit them to slide therein. When the spout nut and the spout body are so

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assembled with the spout pipe, the several fingers of the arms, by being embodied in the circumferential groove or slot of the pipe, will prevent the pipe from being vertically movable with respect to the deck of the plumbing fixture as already explained. On the other hand, the spout pipe is arranged to be rotatable about the axis of the opening in the deck of the plumbing fixture, so that the spout pipe may be turned about that axis to any desired position, i.e., to or through any horizontal angle whatever, so that fluid may be dispensed through the pipe through a wide range of available positions.

This invention, together with its objects and features, will be better understood from the more detailed description hereinafter following when read in connection with the accompanying drawing in which FIG. 1 illustrates a lateral view of the assembled equipment which may be employed in the practice of the present invention; FIG. 2 shows a lateral cross-sectional view taken through the center line or axis 2—2 of the equipment shown in FIG. 1: FIG. 3a shows a cross-sectional view of the spout escutcheon nut which is one of the principal components of the combination of this invention; FIG. 3b shows a bottom plan view of the spout escutcheon nut of FIGS. 1 and 3a when seen from along the lines 3b-3b of FIG. 1; FIG. 3c shows a top plan view of the spout escutcheon nut of FIGS. 1 and 3a when viewed along the lines 3c-3c and FIGS. 1 and 3a; FIG. 4 a shows a lateral view of the spout body, partly in cross-section, which is another important component of the arrangement of this invention; 30 FIG. 4b shows an underside plan view of the spout body of FIGS. 1 and 4a when viewed along the lines 4b—4b of FIGS. 1 and 4a when observed along the lines 4c—4c of FIG. 5 shows a top plan view of a so-called holding nut, when viewed along the lines 5 of FIG. 1; and FIG. 6 illustrates another lateral view of the apparatus of this invention, this figure showing the spout end structure that may be used in this invention.

It may be stated at this point that one of the main objects and features of this invention is to provide a simple coupling arrangement for enabling the average householder to interconnect the spout structure and related piping to the previously installed sink or other plumbing fixture so that the arrangement may quickly and easily be put into service. It is the object of this invention to embody simple parts which are relatively low in cost and can be readily assembled without any requirement for special skills such as those usually expected of a plumber.

In accordance with the present invention, the spout structure including its related spout pipe are preliminarily assembled on the spout escutcheon nut of this invention before the spout structure or the escutcheon nut become actually affixed to, for example, the kitchen sink or to the piping and other parts on the underside of the kitchen sink to which the escutcheon nut and the spout structure are to be thereafter connected. When the spout pipe and spout end structure are initially so connected to the escutcheon nut, the combination is then aligned with the movable spout body and the other underbody components so that all of the parts may be fastened and coupled to each other and properly aligned, quickly and easily, as may be desired so as to be ready for service through and with the plumbing fixture.

Referring more particularly to the drawing, there is shown, in FIG. 1, an external view of the combination of parts required in the practice of this invention. The spout holder SH bearing a spout end SE, which are shown in FIG. 6 and are disclosed in our copending application, Ser. No. 815,797, filed on the same date as the present application and assigned to the same assignee, may be positioned and assembled on a spout

pipe SP which serves as a conduit. The spout pipe SP is so bent that one end of the spout pipe SP may be fitted into the usual or appropriate opening in the deck of a sink Z constituting a representative plumbing fixture or in the corresponding opening of any other plumbing fixture. The spout escutcheon nut designated SN is then positioned on the upper side of the deck of sink Z, at the upper side of said opening. The spout body or underbody designated SB is then to be positioned on the under side or underneath the deck of sink Z adjacent to the 10 same deck opening. The spout nut SN and the spout body SB are to be aligned and affixed to each other when the spout pipe SP is to be installed and assembled on the deck of sink Z.

composite arrangement. One of these is a washer designated W1 which is a flat washer and is to be used when a steel sink is to be installed, but the washer W1 will be omitted when a cast iron sink is to be employed. Another is a slip joint washer W2, which may be a 20 rubber washer, tapered as shown, to establish a leakproof connection between the spout body SB and pipe PP which is to be interconnected between the spout body SB and a control valve (not shown). The third washer designated W3 is preferably a flat steel washer. This washer is interposed at the inner end wall of a threaded holding nut BN which may be fastened to the threaded lower side of the spout body SB as shown in FIG. 1. The washer W2 is pressured by the holding nut BN against the pipe PP and also against the inner wall of the spout body SB 30 to establish a leak-proof connection. The arrangement also includes an O-ring designated O for sealing the spout pipe SP and the spout body SB against leakage.

It will be observed from FIGS. 3a, 3b and 3c that the spout escutcheon nut SN has a central opening OP through which the lower end of the pipe SP may be inserted. The spout nut SN embodies, for example, four arms A1, A2, A3 and A4, each of which has a corresponding finger F1, F2, F3 and F4 at its lower end. Only three of the arms and fingers are shown in FIG. 3a. The pipe SP has two parallel circumferential grooves G1 and G2, as shown in FIG. 2. The O-ring O may be assembled and positioned in the lower groove G1 so that it is held in that groove continually, while the upper groove G2 will receive all of the several fingers F of all 45 of the several arms. Fingers F1 and F3, the diametrically opposite fingers, are shown in FIGS. 2 and 3a. The corresponding arms A1 and A3, which are also shown in FIGS. 2 and 3a, are positioned adjacent to the outer periphery of the pipe SP within the region of the inner 50 wall of the spout nut SN.

The spout nut SN is initially assembled about the spout pipe SP (along with its related spout holder and the spout end), as already suggested. When fingers F1, F2, F3 and F4 are moved into place in the cavity of the circumferential groove G2, the spout nut SN will be held against vertical movement and it will be retained by the spout pipe SP so that, after the assembly is completed, neither the spout pipe SP nor the spout nut SN may be disassembled from each other, nor even moved verti- 60 cally one with respect to the other.

The spout body SB, as shown in FIGS. 2 and 4, includes a necked cylindrical segment NP1 which is externally threaded so that it may be joined to the internally threaded cylindrical wall segment of the spout nut SN. The lower end of the spout body SB, which is designated NP2, is also a necked cylindrical segment which is externally threaded and is to be joined to the internally threaded cylindrical segment of the holding nut BN.

As already suggested, the spout nut SN includes a 70 central or axial opening OP which is to receive the necked threaded segment NP1 of the spout body SB, so that both parts may be connected to each other. When these two parts SN and SB are threaded to each other (see FIG. 2), the spout pipe SP having previously been placed 75 cause the washer W3 to urge the flexible washer W2

in position in the spout nut SN, the arms A1 to A4 of the spout nut SN will become aligned along the periphery of the outer wall of pipe SP and the fingers F1 to F4 will be retained and confined by the spout body SB within circumferential groove G2 of the pipe SP. The O-ring O will be in its position in groove G1 and retained in this position for leakage protection. The joinder of the spout nut SN and the spout pipe SP with the spout body SB under these conditions will thus provide a firm backing and support for the arms A1 to A4 of the spout nut SN, as is clearly seen in FIG. 2, to prevent the fingers F1 to F4 from being withdrawn from the groove G2 of the spout pipe SP. The backing provided by the arms A1 to A4 and by the necked member NP1 of the spout Three washers are included for the assembly of the 15 body SB will bar the removal of the fingers F1 to F4 from groove G2. The spout pipe SP, therefore, will not be movable, upwardly or downwardly, while the spout nut SN and spout body SB are threaded together in this combination. However, the spout pipe SP and the spout end are rotatable as a unit about the axis of pipe SP. The O-ring O will be retained in groove G1 to prevent

After the pipe SP and the nut SN are assembled and therefore held in their respective substantially vertical positions, the pipe PP may then be inserted into the spout body SB below the deck of sink Z as shown in FIG. 2. Then the assembly or installation may be further advanced by connecting the back nut BN to the necked segment NP2 of the spout body SB. The nut BN will be used to assemble the washers W2 and W3 between the parts SN and BN as is clearly shown in FIG. 2. When the installed arrangement is to be disassembled, the back nut BN may be first uncoupled from the spout body SB and then the spout body SB may be likewise uncoupled from the spout 35 nut SN.

Although the fingers F1 to F4 are four in number in a practical arrangement, it will be apparent that any number of such gripping and flexible fingers may be employed in the practice of the invention. Furthermore, the several arms A1 to A4 and the corresponding fingers F1 to F4 need not be physically part of the spout nut SN as shown and described, but they may be fully severable or severed from the spout nut SN so that they may be separately inserted into the appropriate gap between the spout body SB and the spout pipe SP. It is important to have the finger portions F1 to F4 held within the groove G2 of pipe SP to bar vertical removal of pipe SP.

When the parts of the combination are assembled as shown in FIGS. 1 and 2, the spout pipe SP will be firmly gripped within the spout body SB so the spout body SB will be retained in its position within the appropriate opening of the deck of the sink Z. The spout pipe SP will be rotatable about the axis of the opening in the deck of sink Z as in conventional constructions. Notwithstanding the rotatability of the spout pipe SP together with its spout holder and spout end as a unitary combination, the O-ring O will serve to prevent any leakage of water between the segments of the arrangement. The parts may be assembled to one end of a pipe PP which is not un-

It will be apparent from the foregoing that when the deck of the sink Z is a thin member as in a stainless steel sink, in contrast of the thick deck of a cast iron or other sink, the washer W1 may be retained as desirable to the assembly.

The piping PP may interconnect the lower end of the spout body SB with a main control valve mechanism in any well known manner. It will be seen from FIG. 2 that the upper end of the piping PP is tapered at T and that two washers W2 and W3 are positioned about the outer surface of the piping PP. When the back nut BN is threaded about the external threads at the necked segment NP2 of the spout body SB, pressure applied to the back nut BN, by means of a wrench, for example, will

against and between the sides of the piping PP and the inner wall of the spout body SB. As is clearly shown in FIG. 2, these washers will also seal the structure against

All of the parts may be made of plastic materials if desired although the O-ring O is preferably made of flexible material, such as rubber. Likewise, the washer W2 may preferably be made of a like flexible material, such as rubber as already noted. The back nut BN may be octagonal in shape as shown in FIG. 5, but any other shape will suffice.

Although the intercoupling structure has been shown and described as applicable to a spout arrangement for a kitchen sink installation, it is equaly applicable to other types of fluid coupling structures for plumbing fixtures for the bathroom or for the kitchen or for other localities. One of the main features of the construction resides in the configuration of the necked cylindrical segment NP1 of the spout body SB which is inserted into a corresponding threaded opening in the spout nut SN. The arrangement employs the featured fingered arms, i.e., arms A1 to A4, and the corresponding fingers F1 to F4, which are retained between the neck portion NP1 and the outer wall of the spout pipe SP, all arranged so that the pipe SP will be held against vertical movement after the assembly is completed. The pipe SP and the spout nut SN will remain fixed against the upper deck of the sink Z, but the spout pipe SP is rotatable at all times through any desired angle about the sink deck.

shown and described as related to mechanism for assembling a spout structure, including a spout pipe and a spout end, for use on a plumbing fixture, it will be readily understood that any spout structure arrangement, including one in which the spout pipe and the spout end are joined together as a single or unitary structure, may be employed in the practice of the present invention.

Although this invention has been shown and described in certain particular arrangements merely for illustration and explanation, it will be clearly understood that the constructional features of this invention may be applied to many other and widely varied organizations.

What is claimed is:

1. Apparatus for mounting a spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture, comprising a nut having an opening through which a portion of said pipe of said spout structure is inserted, a body positioned on the underside of said plumbing fixture, said pipe having a groove, said nut having an arm which is positioned adjacent the outer surface of said pipe and having a finger which is inserted into said groove to guide the rotation of said pipe about said nut, said nut and said body having corresponding cylindrical meshed threaded sections, said body having means thereon preventing removal of said 55 finger from said groove, and means for clamping said body against the underside of said plumbing fixture.

2. Apparatus for mounting a spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture according to 60 claim 1, in which the groove is circumferentially arranged about the pipe, so that the spout structure may be moveable to any position about the axis of said pipe but cannot be moved along the length of said pipe.

3. Apparatus for mounting spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture according to claim 2,

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in which there are a pluralty of parallel arms positioned adjacent the outer surface of said pipe and each arm has a finger which is inserted into the circumferential groove.

4. Apparatus for mounting a spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture according to claim 1, including means inserted between the pipe and the body to prevent leakage.

5. Apparatus for mounting a spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture according to claim 1, in which the clamping means includes a second nut which is threaded against the body.

6. Apparatus for mounting spout structure which may be supported on a pipe and which is insertable through an opening in a plumbing fixture according to claim 5, in which the clamping means also includes a resilient washer which is pressed by said second nut against said body.

7. Apparatus for mounting a spout structure which 20 is supported on a pipe and which is insertable through an opening in a plumbing fixture so that said spout structure will be rotatable about the axis of said opening but may not be moved longitudinally along the axis of said opening, a groove circumferentially cut about said pipe, an extended, slender, flexible arm positioned longitudinally along the surface of said pipe and having a terminal finger which may be inserted in said groove, holding means for retaining the finger of said arm within said groove, and means for gripping said holding means Although the arrangement of this invention has been 30 against said plumbing fixture thereby preventing the removal of said finger from said groove.

8. Apparatus for mounting a spout structure which may be supported on a pipe and which is to be installed upon the deck of a sink or other plumbing fixture, com-35 prising an escutecheon nut which fits over the pipe of said spout structure and above the deck of said sink, a spout body which is to be positioned over the pipe of said spout structure, the pipe structure having a circumferential groove, the escutecheon nut having a cylindrical 40 threaded section and a plurality of arms which are to be positioned adjacent and parallel to the outer surface of the pipe, each of said arms having a finger which extends into the groove of said pipe to hold the nut against movement along the pipe, the spout body having a cylindrical threaded section which is insertable through the opening in the deck of the sink and into the cylindrical threaded section of said nut, said spout body having means thereupon preventing removal of said finger from said groove, and means for retaining the spout body fixedly against the underside of the sink.

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U.S. Cl. X.R.

285-272, 319