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U1S S1184

(56) Documents cited
GB 2188115 A GB 2133850 A GB 1604444 A
GB 1474929 A GB 1419859 A GB 1329157 A

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(54) Connection assembly

(57) A connection assembly for a waste disposal unit comprises a stainless steel, open-ended tubular sink bush (35), which can be retained in a sink outlet hole by means of its flanges (36), a plastics material hopper (12), a lock ring (30), and a rubber seal (24). An end of the sink bush (35) has an annular groove (37) in its outer surface for engagement with a corresponding annular projection (25) on the internal surface of the hopper (12). Slots (28) divide one end of the hopper into flexible fingers (29) which allow the sink bush to be fitted in the end of the hopper as a snap-fit. Once the lock ring (30) is screwed up around the fingers (29) the hopper and sink bush are securely connected. The seal (24) is compressed by an end of the sink bush (35) and prevents leakage between the hopper and sink bush.

FIG 1

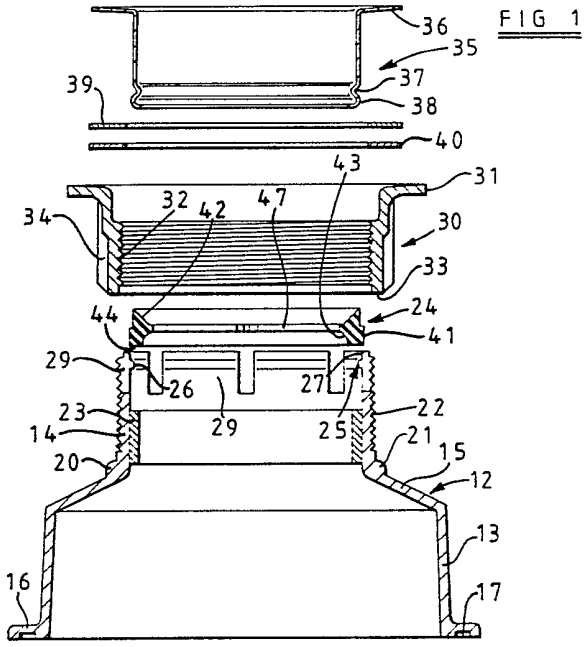

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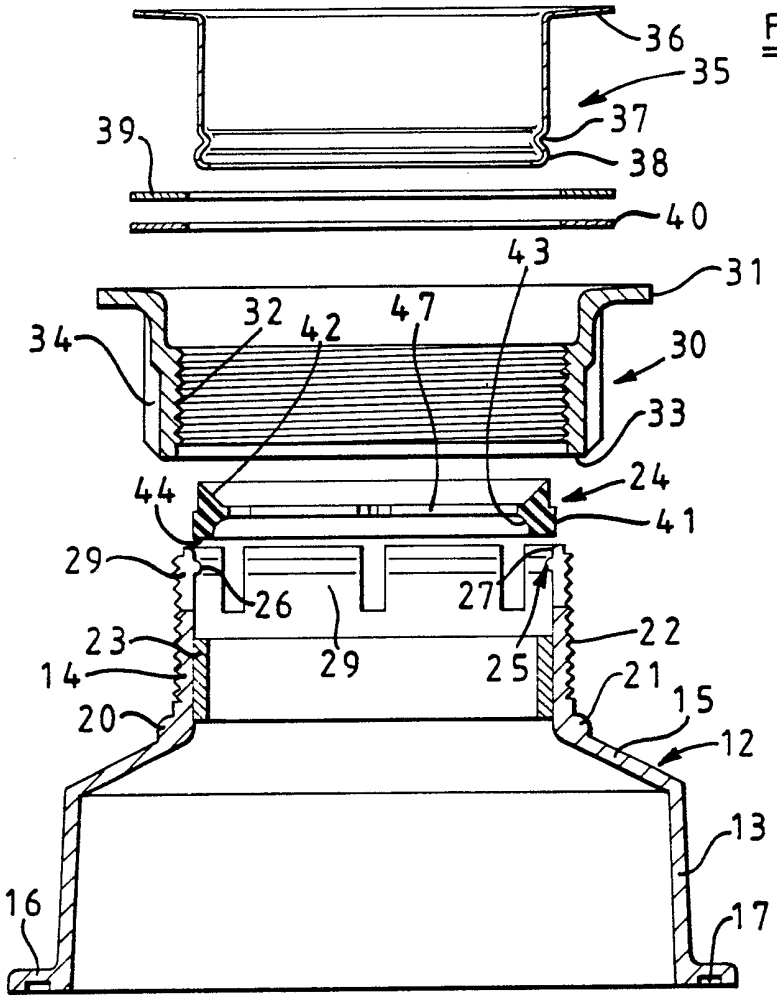
FIG 1



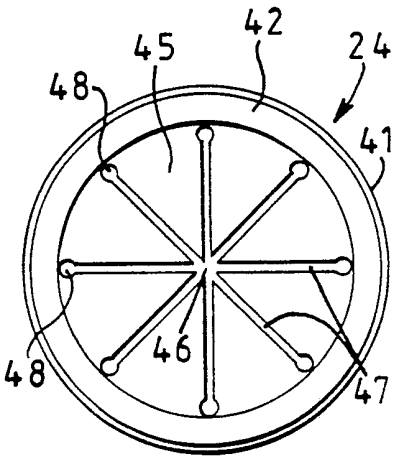


FIG 3

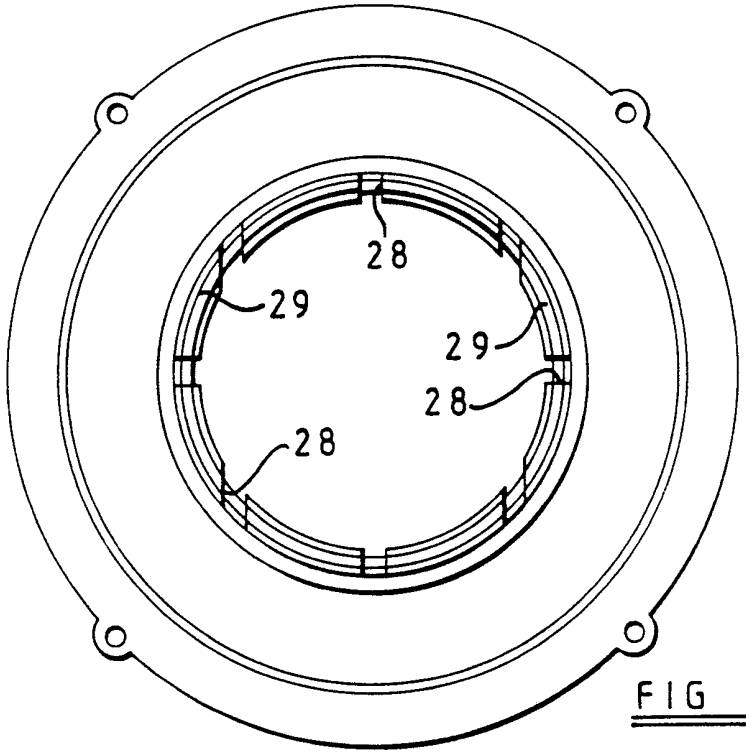


FIG 2

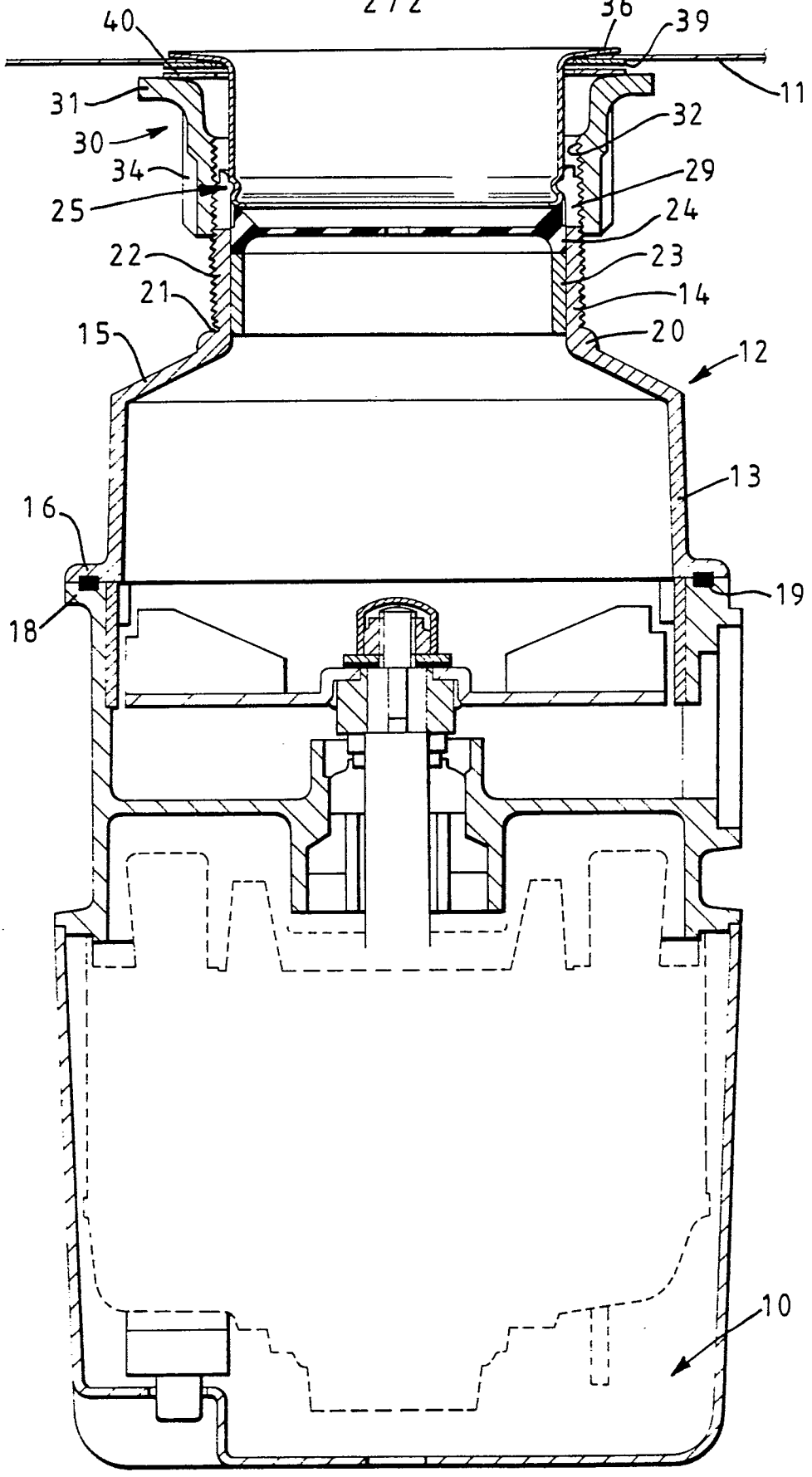


FIG 4

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CONNECTION ASSEMBLY

This invention relates to a connection assembly, and has particular, though not exclusive application to the attachment of a waste disposal unit to a sink.

At present the attachment of a waste disposal unit beneath a sink generally involves many parts, thus resulting in relatively high costs, and various fixing screws and bolts, which can be awkward to fit and present the risk that they can become lost if dropped.

An object of the invention is to provide a connection assembly in an efficient and convenient manner.

According to the invention a connection assembly comprises a first member having an end part of hollow tubular form, a second member receivable, in use, in said end part of the first member, the first and second members being engageable together by means of a projection and recess arrangement, and a locking member engageable with the exterior of the first member or the interior of the second member to prevent disengagement between the first and second members.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an exploded sectional side view of a connection assembly of the invention,

Figure 2 is a top plan view of one of the components shown in Figure 1,

Figure 3 is a top plan view of another of the components shown in Figure 1, and

Figure 4 is a sectional side view of a waste disposal unit attached to a sink by means of the connection assembly of the invention.

Figure 1 shows part 10 of a conventional waste disposal unit, which is attached to the base of a sink 11 by a connection assembly of the invention. Since the part 10 is of known construction and forms no part of the invention, it will not be further described.

Referring now to Figures 1 to 4, there is shown a plastics material hopper 12, having a lower, generally cylindrical wall 13 and an upper, reduced diameter cylindrical wall 14, which are integrally interconnected by a frustoconical wall 15. At its lower, wider end, the wall 13 has an external, radially directed, annular flange 16, which has an annular rectangular section groove 17 in its downwardly directed surface. Moreover, equi-angularly spaced around the periphery of the flange 16 are four integral lugs (not shown) with fixing holes therethrough. These enable the flange of the hopper to be secured to a similar flange 18 at the top of the part 10 as shown in Figure 4, with a seal 19 being contained in the groove 17 and a matching groove in the flange 18 of the part 10.

The external junction between the walls 14 and 15 is formed with an annular projection 20 providing an annular, upwardly facing, generally flat surface 21, which extends radially outwardly further than the outer surface of the wall 14 and forms a stop. This outer surface is provided with a screw thread 22.

Internally, just above its junction with the wall 15, the wall 14 has a plastics material sleeve 23 welded or otherwise secured thereto. The sleeve is in the form

of a rectangular section ring and serves to support, in use, a rubber, circular splashguard/sealing ring 24 as will be described. At its end remote from the wall 15, the wall 14 has an integral, internal annular projection or lip 25 formed by a sharply radiussed surface 26, from which a slightly radiussed surface 27 extends to the upper, free end of the wall 14.

This free end of the wall 14 at which the lip is formed is provided with eight rectangular slots 28 equi-angularly spaced therearound. One pair of facing slots are radially directed and these are the ones through which the sections are taken in Figures 1 and 4. Another pair of facing slots are also radially directed along a diagonal at 90° to the section containing the said one pair of slots. The remaining four slots are disposed parallel to a plane containing said diagonal. The slots terminate inwardly short of the sleeve 23, and form the end of the hopper into eight flexible fingers 29.

Intended to be carried on the neck of the hopper, constituted by the wall 14, is a plastics material lock ring 30. The ring 30 is stepped both internally and externally, and its wider, upper end has a radially outwardly directed, peripheral flange 31. The internal surface of the lower, reduced diameter part of the ring is screw-threaded as at 32 to match and engage with the screw-thread 22 on the hopper. The thread 32 terminates just short of the lower end of the ring and the lower annular end surface 33 of the ring is flat. The exterior of the ring is formed with ribs 34 to assist rotation of the ring when, as will be described, it is screwed up on the hopper to the position shown in Figure 4.

The connection assembly also includes a sink bush 35 which is of stainless steel and which is intended to fit in an outlet opening of the sink 11 as shown in Figure 4. The bush 35 is a cylindrical ring having an upper radially outwardly directed radial flange 36 which rests on the interior base surface of the sink 11 around the sink opening thereby retaining the bush in said opening. The bottom part of the bush has its thin wall deformed inwardly to form an annular recess or groove 37 of generally arcuate section, the short remaining part of the ring below the groove having an external surface 38 of arcuate, convex form. The cross-section of the groove is complementary to that of the lip 25. Circular upper and lower rubber gaskets 39, 40 respectively, are provided for use with the sink bush as will be described.

The sealing ring 24 has a straight, axially directed outer surface 41 which, approximately at its mid-point, is outwardly stepped, so that the top half of the outer surface is relieved relative to the bottom half. The ring has a flat, downwardly and inwardly sloping surface 42 extending from its upper end and a curved, upwardly and inwardly directed surface 43 extending from its lower flat surface 44, which surface 44 is normal to the ring axis. The surfaces 42, 43 meet approximately centrally of the ring to form an internal web 45 across the interior thereof. However the web has a central, generally circular opening 46 from which eight equi-angularly spaced, elongated, rectangular slots 47 radiate, each terminating in a part-circular opening 48. The slots thus allow the web to open and close flexibly, in use, to allow the passage of waste material from the sink into the waste disposal unit.

In use, the components of the waste disposal unit, including the connection assembly of the invention, would normally be supplied fitted together with the lock ring 30 securing the sink bush and hopper together, the gaskets 39, 40 being held on the sink bush between the flange 36 thereof and the flange 31 of the lock ring 30.

Accordingly it is firstly necessary to unscrew the lock ring 30 until it is fully down to the bottom of hopper wall 14 with its surface 33 in contact with the stop formed by the hopper surface 21. In this position the topmost one of the threads 32 is at or just below the level of the bottom of the slots 28. The sink bush, complete with gaskets 39, 40, can then be disengaged from the hopper by grasping the sink bush by its flange 36 and pulling upwardly, the fingers 29 flexing outwardly as the lip 25 contacts surface 38 of the sink bush, said fingers moving into the internal space provided by the upper stepped part of the lock ring.

Next, the sink bush, with the upper one of the gaskets 39 in place, is inserted into the waste outlet hole of the sink. It is important that the flange 36 of the sink bush lies at least flush with the base surface of the sink so that water will run freely over its edge and be drained away. If the flange 36 lies proud of the base surface of the sink, it is necessary to remove the gasket 39. In this case, in order to seal the sink bush to the sink, the underside of the sink bush should be coated with a suitable sealant. If the gasket 39 is not fitted above the base surface it can be received on the sink bush below the gasket 40. Then holding the hopper, and attached waste disposal unit, in the palm of one hand, and directly below the sink bush, the sink bush is held down whilst the hopper and unit is pushed

upwardly until the hopper snap-fits onto the sink bush. The surface 27 and then the surface 26 of the lip 25 contact the surface 38 of the sink bush during this upward movement of the hopper, and as a result the fingers are flexed outwardly until the lip 25 enters the groove 37 as a snap-fit, with the fingers returning to their normal positions thereafter. The lock ring 30 is then gripped by its ribs 34 and screwed up until it almost makes contact with gasket 39 or 40. Before the lock ring is finally tightened the unit can be rotated for fitting a waste outlet pipe thereto and for aligning the fitted outlet pipe with the plumbed waste pipe system and connecting the two together.

The lock ring can then be tightened until it engages tightly against the underside of the sink, ensuring that the sink bush is watertight in the sink and that the waste disposal unit is held rigid in relation to the waste plumbing. The lock ring does of course prevent any outward movement of the fingers 29 and the hopper is thus tightly secured against downward movement.

As shown in Figure 4, the seal 24 is arranged with its lower flat surface 44 supported on the sleeve 23, and when the hopper is snap-fitted to the sink bush its surface 42 engages the bottom of sink bush surface 38 to prevent leakage between the sink bush and the hopper. In use the slotted rubber web 45 acts as a splashguard through which waste material can be pushed by means of a spatula or the like. The relieving of the outer peripheral surface of the seal ensures that compression and outward expansion of the seal due to pressure exerted on its top face by the sink bush, does not interfere with the fingers of the hopper, since if this did cause the fingers to flex outwardly, the free rotation of the lock ring would be restricted.

Although in the embodiment of the invention described and illustrated the projection is on the hopper and the recess in the sink bush, the arrangement could of course be reversed so that the projection is on the sink bush and the recess in the hopper. Moreover the flexible fingers could be on the sink bush instead of the hopper and the lock ring replaced by a locking member engageable in the sink bush to hold the fingers against the interior of the hopper to prevent disengagement of the connection assembly.

The connection assembly of the invention is thus effective, uses less components than previous fixings, is quick and easy to complete and has no screws or bolts which might be lost. As the hopper and lock ring are preferably of plastics material the cost of the fixing can be reduced. It does, of course, clearly have application other than with waste disposal units.

CLAIMS

1. A connection assembly comprising a first member having an end part of hollow tubular form, a second member receivable, in use, in said end part of the first member, the first and second members being engageable together by means of a projection and recess arrangement, and a locking member engageable with the exterior of the first member or the interior of the second member to prevent disengagement between the first and second members.

2. A connection assembly as claimed in claim 1, wherein one of said projection and said recess extends around the interior of said end part of said first member, being interrupted by slots extending inwardly from a free end of the first member so as to form a plurality of flexible fingers which initially flex outwardly as the second member, with the other of said projection and said recess thereon or therein, is received in said end part, in use, and then return inwardly as the projection engages in the recess.

3. A connection assembly as claimed in claim 2, wherein the locking member is engageable with said first member around its exterior surface at a position to prevent said fingers flexing outwardly.

4. A connection assembly as claimed in claim 3, wherein the locking member is internally screw-threaded for engagement with a complementary screw-thread on said exterior surface of the first member, the locking member being movable from a release position on the first member, where it is clear of the part of the screw thread around the fingers which can thus flex outwardly, to a locking position where it engages said

part of the screw thread thereby preventing such outward flexing of the fingers and thus the release of the projection from the recess.

5. A connection assembly as claimed in claim 4, wherein the first member has a stop on its outer surface against which one end of the locking member abuts in its released position.

6. A connection assembly as claimed in claim 4 or claim 5, wherein the interior surface of the locking member is stepped to provide a portion wider than the internally screw-threaded portion, said wider portion being disposed at the level of said fingers in said released position of the locking member so that said fingers can flex outwardly.

7. A connection assembly as claimed in claim 6, wherein an outwardly extending peripheral flange is provided at the other end of the locking member.

8. A connection assembly as claimed in any one of claims 2 to 7, including a seal between the first and second members.

9. A connection assembly as claimed in claim 8, wherein a sleeve is secured to the interior of said end part of the first member, the sleeve being disposed further inward from said free end thereof than the termination of the slots, the seal being provided by a sealing member intended to be supported by said sleeve, in use, at one side and compressed at its oppositely facing side by said second member when engaged with said first member.

10. A connection assembly as claimed in claim 9, wherein a part of the outer peripheral surface of the sealing member is relieved, so that when compressed by said second member, in use, its outward expansion does not cause outward flexing of the fingers.

11. A connection assembly as claimed in claim 9 or claim 10, wherein the sealing member has a central web in which is a central aperture from which radial slots extend, to allow the web to flex between open and closed positions to allow material therethrough.

12. A connection assembly as claimed in any one of the preceding claims, wherein said projection extends around the interior of said end part of the first member and said second member is of hollow tubular form having the recess in and extending around its outer surface adjacent one end, the other end of the second member having an outwardly extending peripheral flange.

13. A connection assembly as claimed in claim 12, wherein the first member is a plastics material hopper, the second member is of stainless steel and the locking member is of plastics material.

14. A waste disposal unit including a connection assembly as claimed in any one of the preceding claims.

15. A connection assembly substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

16. A waste disposal unit including a connection assembly substantially as hereinbefore described with reference to and as shown in Figure 4.

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