

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN AND RELATING TO FIXTURES FOR MOUNTING ON THE END OF A TUBULAR MEMBER, SUCH AS THE DISCHARGE SPOUT OF A GAS BOTTLE

(71) We, A/S TEKNØVA, 2990 Nivaa, Denmark, a Company organised under the laws of Denmark, 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:—

This invention relates to a coupling or fixture of the type which comprises a socket to be mechanically secured on the end of a tubular member, such as the discharge spout of a gas bottle, and having means for opening a closure valve located in said tubular member, said fixture further comprising a locking member arranged in use to cooperate with an external annular groove in the tubular member and associated with a shaft which extends substantially radially of the socket and upon rotation causes the locking member to enter into the groove and clamps it against a wall thereof.

In a known structure of this type the shaft is journaled in such a way in the housing of the fixture that by rotation in one direction it is positively displaced towards the tubular member, and by rotation in the opposite direction is displaced away from this member. The locking member is formed by a cam provided at the end of the shaft adjacent the tubular member and eccentric relative to said shaft so that by rotation of the shaft the cam is forced against the upper wall of the external groove of the tubular member, thus forcing the socket more or less firmly against the outside of the tubular member. By this operation a tube which is mounted centrally inside the socket engages the closure valve of the tubular member and opens this valve. The required firm securing depends on a considerable pressure between the locking cam and the wall of the groove which means that a substantial friction must be overcome during the composite movement of the shaft, i.e. the simultaneous rotation and displacement thereof. Therefore,

the parts which by the rotation of the shaft are to cause it to be displaced must be rather tough in order to be able to stand the wear, and the dimensions of the fixture must be greater than otherwise desirable. Further, an increased manual force is required for rotating the shaft in order to overcome the frictional resistance.

A purpose of the invention is to provide a coupling or fixture which due to a simplified design can be made more compact and safer in its operation than the known embodiment, and is easier to use.

According to the invention there is provided a fixture comprising a housing having a socket for mounting on the end of a tubular member, such as the discharge spout of a gas bottle, and having means for opening a closure valve located in said tubular member, said fixture comprising a locking member for engagement with an external groove in the tubular member and associated with a shaft which extends substantially radially of the socket and upon rotation causes the locking member to enter into the groove and clamps it against a wall thereof, the shaft comprising a first eccentric section for directly controlling the valve opening means, and a second eccentric section extending through an opening in the shank of a hook forming the locking member which hook is further guided in such a way in the housing of the fixture that its hook portion is moved radially into the groove of the tubular member when, by rotation of the shaft, the hook is displaced in its clamping direction.

In this case the shaft need only be rotatable, and not also displaceable, in the housing because the required radial movement of the locking member due to its particular guiding in the housing is derived from the rotation of the shaft and does not necessitate displacement of any element of the fixture. In this way it becomes easier to establish and maintain the

required sealing around the shaft because the sealing means used for this purpose will be less subjected to wear than in case the shaft must be rotated as well as displaced.

5 Another advantage is that the opening motion of the closure valve of the tubular member does not depend on the firm clamping of the housing of the fixture upon said member but is derived from the rotation of the shaft and
10 via the valve opening member. This makes possible a favourable coordination of both operations, for instance by a suitable design of both eccentric sections of the shaft.

The radial movement, referred to above, of
15 the hook member may advantageously be ensured by providing said hook member with a heel portion supported by an inclined guide surface in the housing of the fixture. By such arrangement it becomes easy to obtain any desired transmission ratio between the rotation
20 of the shaft and the displacement of the hook portion and to carefully adjust this transmission ratio if necessary for any special purpose.

In a preferred embodiment of the invention
25 the guide surface of the housing is provided in a separate piece of wear resistant material accommodated in a recess in the housing and held in place by a centric or coaxial section of the shaft. Such wear resistant piece can
30 without trouble be replaced when needed, and it can be produced with a sufficient degree of accuracy by casting without substantial finishing work. It would be more complicated and more expensive to work out the guide surface
35 in the housing itself.

An embodiment of the fixture according to the invention will now be more fully described with reference to the accompanying drawings which with certain portions broken away shows
40 an axial section through the fixture as mounted on the top of the tubular member or neck portion, shown in dot-and-dash lines, of a gas bottle.

The gas bottle neck portion 1 is formed in
45 its external surface with an annular groove 2 or a similar recess. The housing 3 of the fixture comprises a socket 4 surrounding the tubular member or neck portion 1 and provided with an axial tube portion 5 which at its
50 lower end carries a sealing ring 6 for engagement with a closure valve (not shown) in the bottle neck, the tube portion 5 forming a guide for a displaceable valve opening member 7 that is urged upwardly by a pressure spring
55 8. Thus, the upper end of the valve opening member 7 is held against an eccentric pin 9 carried by the end of a shaft 10 and forming the first eccentric section, referred to in the foregoing, of this shaft. The shaft 10, which
60 extends substantially radially of the socket 4 is journaled in a bore 11, the right hand end of which forms a gas outlet 12 that may be connected to a flexible tube, not shown. By
65 13 is indicated a filter inserted upstream of the outlet 12. Backwards gas leakage along the

shaft 10 is prevented by a pair of ordinary sealing rings 14. The shaft is held against displacement by means of an arresting pin 15 engaging loosely into an annular groove 16 in the shaft. 17 is a knob for manual rotation of the shaft and 18 indicates a stop for limiting such rotational movement.

In the position illustrated on the drawing the valve opening member 7 is pressed farthest downwardly, and the fixture is locked onto the
75 gas bottle neck 1 by means of a hook member 19, the hook portion 20 of which engages the annular groove 2 of the neck portion 1. The hook member 19 is, together with a wear resistant piece 21, accommodated in a recess 22
80 in the fixture housing 3, and the hook member comprises a heel portion 23 which is supported by a guide surface, including an inclined section 24, in the wear resistant piece 21. This piece 21 is held in place in the recess 22 by
85 means of a centric or coaxial section 25 of the shaft 10 extending through a closely fitting aperture in the wear resistant piece. This centric section is followed by an eccentric shaft section 27 which with a sufficient clearance extends through an opening 28 in the shank of the hook member 19 and is angularly off-set
90 through 180° relative to the eccentric pin 9 of the shaft. On the drawing the eccentric section 27 and thus the hook member 19 are shown in their uppermost positions in which the guide surface of the wear resistant piece 21 forces the hook portion 20 into the annular
95 groove 2. At the same time the hook portion 20 is drawn upwardly to engage firmly the upper wall of the groove so that the housing of the fixture is clamped under a sufficient pressure against the tubular member 1. By rotation of the shaft 10 the hook member 19
100 will be downwardly displaced and moves, possibly under a positive force, into the recess 22 in the piece 21 so that its hook portion 20 is withdrawn from the groove 2. At the same time the eccentric pin 9 is turned upwardly so that the valve opening member 7
105 may yield in the same direction, thus causing a re-closing of the valve, not shown, within the neck portion 1.

A fixture as shown may form an integral part of a gas flow regulator intended for
115 mounting on the top of a gas bottle but it may also form a separate element which like a snap action coupling can provide connection between a source for pressurized fluid and a fluid consuming device.

WHAT WE CLAIM IS:—

1. A fixture comprising a housing having a socket for mounting on the end of a tubular member, such as the discharge spout of a gas bottle, and having means for opening a closure valve located in said tubular member, said
125 fixture comprising a locking member for engagement with an external groove in the tubular member and associated with a shaft which extends substantially radially of the socket and
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2. A fixture as claimed in claim 1, in which the hook portion is provided with a heel portion supported by an inclined guide surface in the housing of the fixture.

3. A fixture as claimed in claim 2, in which the guide surface is provided in a separate piece of wear resistant material accommodated in a recess in the housing and held in place by a centric or coaxial section of the shaft.

4. A fixture comprising a housing having a socket for mounting on the end of a tubular member, substantially as described with reference to the accompanying drawing.

For the Applicants,
FRANK B. DEHN & CO.,
Chartered Patent Agents,
Imperial House, 15—19 Kingsway,
London, W.C.2.

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