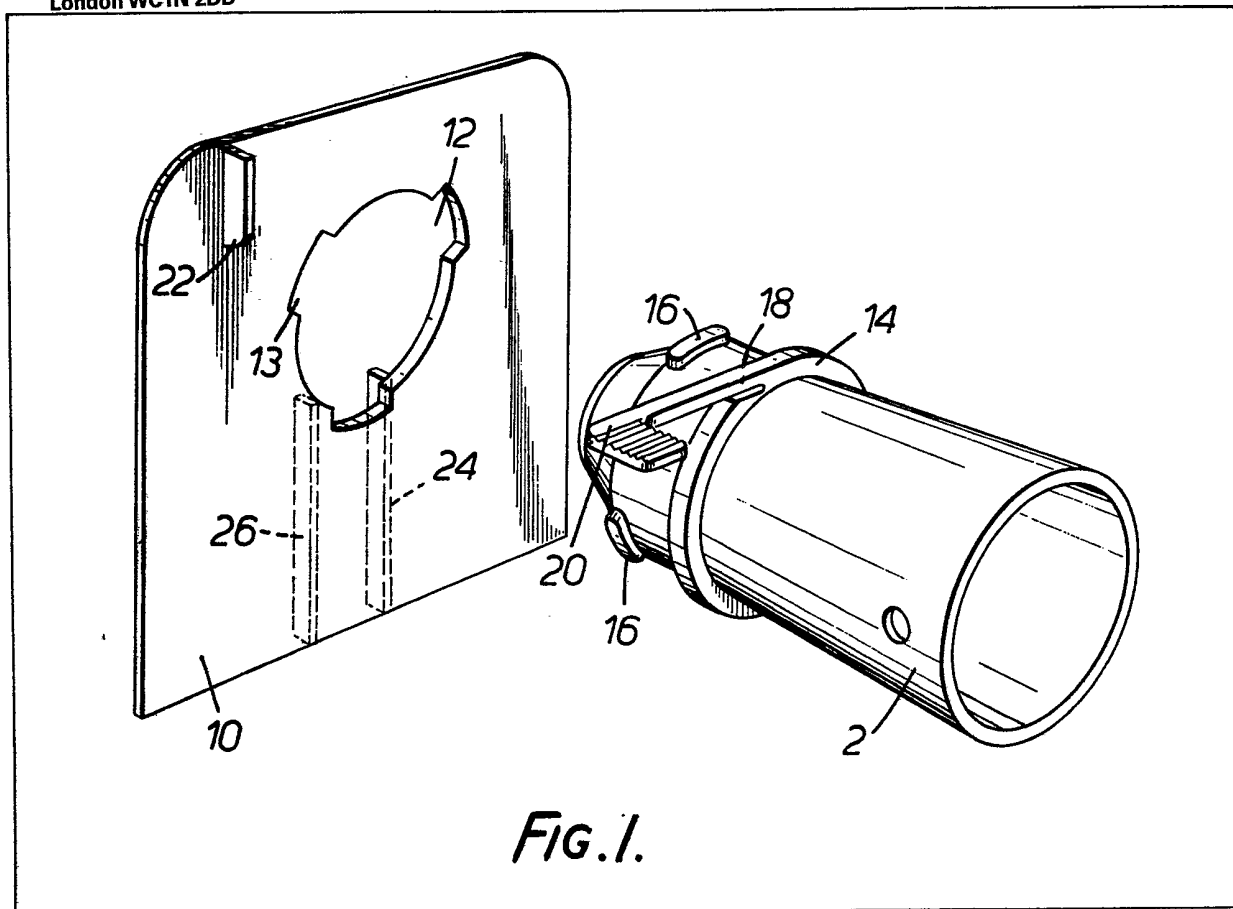


- (21) Application No 8310023
- (22) Date of filing 13 Apr 1983
- (30) Priority data
- (31) 8211534
- (32) 21 Apr 1982
- (33) United Kingdom (GB)
- (43) Application published 9 Nov 1983
- (51) INT CL³
F16L 37/24
- (52) Domestic classification
F2G 36 9A 9C 9E
U1S 1233 F2G
- (56) Documents cited
None
- (58) Field of search
F2G
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(54) Hose connector for a floor care appliance

(57) The body (2) is connected to the plate (10) by being inserted into the opening (12), the lugs (16) passing through the notches (13). The body (2) is then rotated clockwise to lock the body to the plate, the cammed lugs (16) engaging the rear ends of the cammed notches (13) and then passing behind the rear surface of the plate (10) thus drawing the front surface (18) of the flange (14) into firm contact with the plate (10). During clockwise rotation of the body (2), the finger (20) is deflected and flexed by engaging the abutment (22) until it springs back to engage the abutment and thereby prevent anticlockwise rotation of the body (2).



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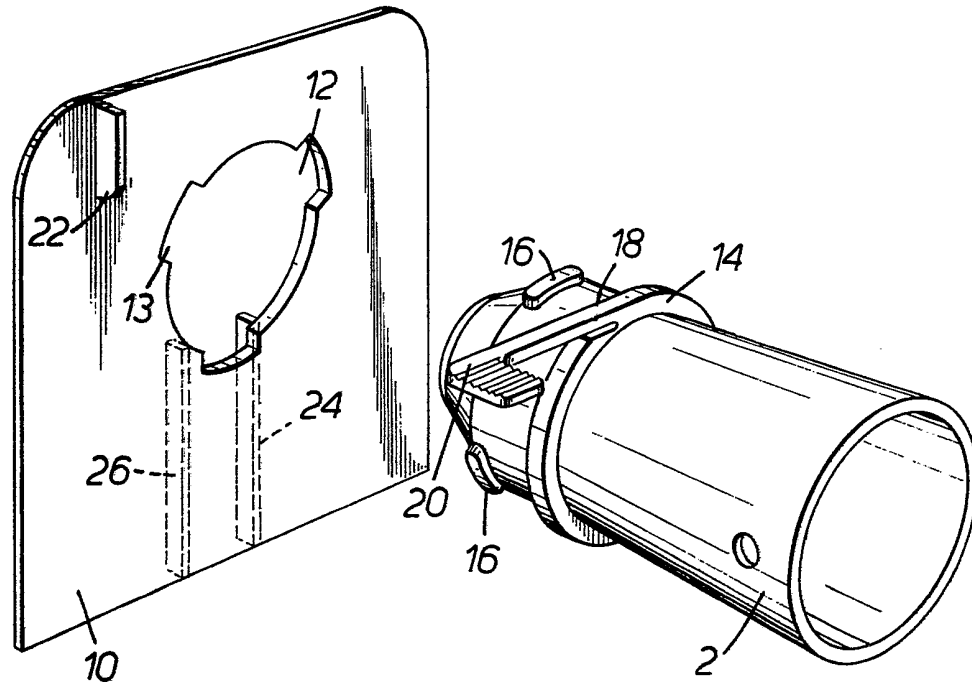


FIG. 1.

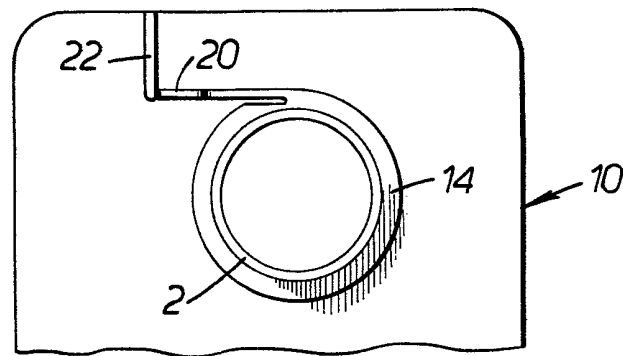


FIG. 2.

SPECIFICATION

Hose connector for a floor care appliance

5 The present invention relates to a hose connector for a floor care appliance and is particularly concerned with such a connector for removably connecting the vacuum hose of a vacuum cleaner to the body of the vacuum cleaner.

10 One common type of vacuum cleaner has a cleaning head at the end of a hose which is removably connected to the body of the cleaner so as to communicate with the dust collecting space within the cleaner and thus to suck up dirt through
15 the cleaning head into the cleaner. Such hoses are commonly connected to the cleaner by a plug and socket connection which is moved between a released and a locked position by relative rotation of the plug and socket.

20 The vacuum hoses tend to be twisted or otherwise rotated during their use and this can lead to the hose connector becoming disengaged which is extremely inconvenient. It is thus an object of the present invention to provide a hose connector which is
25 cheap and simple to manufacture and use but which is not susceptible to unintentional disconnection.

According to the present invention a hose connector for a floor care appliance includes male and female members affording co-operating formations
30 so arranged that the male and female members may be inserted the one into the other and may be connected together and released by relative rotation, one of the male and female members carrying a
35 displaceable latch member arranged to engage a fixed abutment carried by the other of the male and female members during relative rotation thereof in one sense and to be cammed past the abutment by continued relative rotation in that sense and then to
40 return to a latched position in which it engages behind the abutment to prevent relative rotation of the male and female members in the other sense.

Thus the latch when engaged prevents relative rotation of the male and female members in the said other sense and serves to check or prevent their
45 accidental disconnection. The latch member may take many forms, such as a spring loaded latch plunger, but preferably comprises a resilient member which is displaced by bending when cammed past the abutment against its own resilience.

50 In the preferred construction the latch member is elongate and so arranged that if one attempts relative rotation of the male and female bodies in the said other sense with the latch in the latched position, the abutment exerts a reactive force on it
55 substantially in the direction of its length. This means that the latch member must be deliberately moved out of the latched position, e.g. manually by the user, before the connector can be disconnected and it is not possible to disconnect it merely by
60 applying sufficient torque to make the latch member cam back over the abutment.

In one embodiment of the invention the male member comprises a substantially hollow tubular member having on its circumferential surface one or
65 more projections and a peripheral rib, the rib being

arranged to contact the surface of the female member when the male and female hose members are fully connected, and the female member comprises a plate formed with an opening in the
70 periphery of which one or more recesses are formed whose number, shape and position correspond to those of the projections on the tubular member. The latch member is preferably carried by the tubular member and may be integral with the peripheral rib.

75 Preferably the female member carries a first stop arranged to be contacted by one of the said projections and thus to prevent further relative rotation in the said one sense substantially beyond the position in which the latch member is in the latched position.

80 This prevents disconnection of the connector by continued rotation in the one sense.

Preferably the female member carries a second stop arranged to be contacted by one of the said
85 projections and thus to prevent substantial relative rotation in the said other sense after insertion of the male member in the female member. This prevents the male and female members being connected by relative rotation in the direction in which the latch member does not become cammed past the abutment.
90

The invention also embraces a floor care device including such a hose connector for connecting a vacuum hose to the body of the floor care device.

Further features and details of the present invention will be apparent from the following description of one specific embodiment which is given by way of example only with reference to the accompanying
95 diagrammatic drawings, in which:—

100 Figure 1 is a perspective view of a vacuum hose connector for a vacuum cleaner; and

Figure 2 is a scrap elevation of the hose connector.

The hose connector comprises a generally tubular hollow body 2 which comprises the male portion of a bayonet-type connector and which is adapted to be
105 connected to a female portion comprising a connector plate 10 in which a socket opening 12, whose size corresponds to that of the body 2, is provided. In use, the body 2 will be connected to a hose (not shown), such as a vacuum hose, by any convenient means,
110 such as adhesive, whilst the plate 10 constitutes one wall defining the vacuum space within the body (not shown) of a vacuum cleaner and may either be removable from or integral with the said body.

The tubular connector body 2 constitutes a one
115 piece injection moulding integral with which intermediate its ends is a peripheral flange 14. Between the flange 14 and the forward end of the body 2 there are three angularly equispaced retaining lugs 16 whose rear faces which are somewhat inclined to the peripheral direction to act as cam surfaces for a
120 reason which will be explained below.

The portion of the body 2 between the lugs 16 and its forward end is tapered inwardly to facilitate its insertion into female connector member. Integral
125 with the flange 14 is a tangentially extending resilient latching finger 20 whose free end is of enlarged area and adapted to be depressed by the user as will be explained below.

The plate 10 is also of one-piece plastics construction and the opening 12 is provided with three
130

notches 13 whose size and spacing corresponds to that of the lugs 16. On the front surface of the plate 10 and spaced from the opening 10 is an integral latch abutment 22.

5 The body 2 is connected to the plate 10 in the manner usual with such connections, that is to say, the forward end of the body 2 is inserted into the opening 12 with the lugs 16 passing through the notches 13 and the body is then rotated clockwise to lock them together, the lugs 16 engaging the rear ends of the notches 13 and then passing behind the rear surface of the plate 10, and thus drawing the front surface 18 of the flange 14 into firm contact with the face of the plate 10 by virtue of their rear cam surfaces thereby ensuring a substantially airtight seal. The arcuate lengths of the lugs 16 differ, and the arcuate lengths of the notches 13 differ in a corresponding manner, such that the body 2 can only be inserted through the opening 20 in one relative angular orientation namely with the finger 20 adjacent to the left-hand side of the abutment 22 as shown in Figure 1.

The finger 20 and abutment 22 are so positioned that as the body 2 is rotated they engage and the finger 20 is deformed by bending against its resilience. When the body is rotated further the finger 20 springs back in the manner of a latch into the position shown in Figure 2, which may be referred to as the locked position, in which the finger 20 engages the abutment 22. If one attempt to undo the hose connection the abutment 22 exerts a longitudinal reactive force on the finger 20 preventing anti-clockwise rotation of the body 2, and since this reactive force has no bending component the tip of the finger 20 cannot pass the abutment 22. However, if the user bends the finger 20 by exerting a depressive force on the enlarged area at its end, the body 2 may be removed in the usual manner.

It will, however, be appreciated that in this construction the body 2 could be removed from the locked position by continuing to rotate it clockwise. For this reason the plate 10 is provided with an abutment 26 on its rear surface which is engaged by one of the lugs 16 so as to prevent rotation of the body 2 in a clockwise direction beyond the locked position. Thus in the locked position the body 2 is positively locked against all rotation and can only be removed after depressing the finger 20.

It will also be appreciated that in this construction the body and the plate could also be connected together by rotating the body anti-clockwise after the lugs 16 have passed through the notches 13 and that in this case the latching finger would not serve its intended function. For this reason the plate 10 is preferably also provided with a projection 24 on its rear surface immediately adjacent one of the notches 12 which co-operates with one of the lugs 16 to prevent anti-clockwise rotation of the body 2 after insertion, thus ensuring that the body and the plate can only be locked together by relative rotation in one direction only, that is to say the direction in which the latching finger 20 and the abutment 22 will serve their intended purpose.

CLAIMS

65 1. A hose connector for a floor care appliance

70 including male and female members affording co-operating formations so arranged that the male and female members may be inserted the one in the other and may be connected together and released by relative rotation, one of the male and female members carrying a displaceable latch member arranged to engage a fixed abutment carried by the other of the male and female members during relative rotation thereof in one sense and to be cammed past the abutment by continued relative rotation in that sense and then to return to a latched position in which it engages behind the abutment to restrain relative rotation of the male and female members in the other sense.

80 2. A connector as claimed in Claim 1 in which the latch member comprises a resilient member which is displaceable by bending when cammed past the abutment against its own resilience.

85 3. A connector as claimed in any one of the preceding claims in which the latch member is elongate and so arranged that if one attempts relative rotation of the male and female members in said other sense with the latch in the latched position, the abutment exerts a reactive force on it substantially in the direction of its length.

90 4. A connector as claimed in Claim 2, or Claims 2 and 3, or Claims 2 and 4, in which the male member constitutes a substantially hollow tubular member having on its circumferential surface one or more projections and a peripheral rib, the rib being arranged to contact the surface of the female member when the male and female members are fully connected, and the female member comprises a plate formed with an opening in the periphery of which one or more recesses are formed whose number, shape and position correspond to those of the projections on the male member, the projection passing through the recesses when the male member is inserted into the opening of the female member.

105 5. A connector as claimed in Claim 5 in which the latch member is carried by the male member.

6. A connector as claimed in Claim 6 in which the latch member is integral with the peripheral rib.

110 7. A connector as claimed in any one of Claims 5 to 7 in which the female member carries a first stop arranged to be contacted by one of the said projections and thus to prevent relative rotation in the said one sense substantially beyond the position in which the latch member is in the latched position.

115 8. A connector as claimed in any one of Claims 5 to 8 in which the female member carries a second stop arranged to be contacted by one of the said projections and thus to prevent substantial relative rotation in the said other sense after insertion of the male member in the female member.

120 9. A hose connector for a floor care device substantially as specifically herein described with reference to the accompanying drawings.

125 10. A floor care device including a hose connector as claimed in any one of the preceding claims for connecting a vacuum hose to the body of the floor care device.

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd.,
Berwick-upon-Tweed, 1983.
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.
