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3,335,744

HOSE CONNECTING STRUCTURE FOR VACUUM CLEANING SYSTEMS

Filed Aug. 25, 1965

3 Sheets-Sheet 1

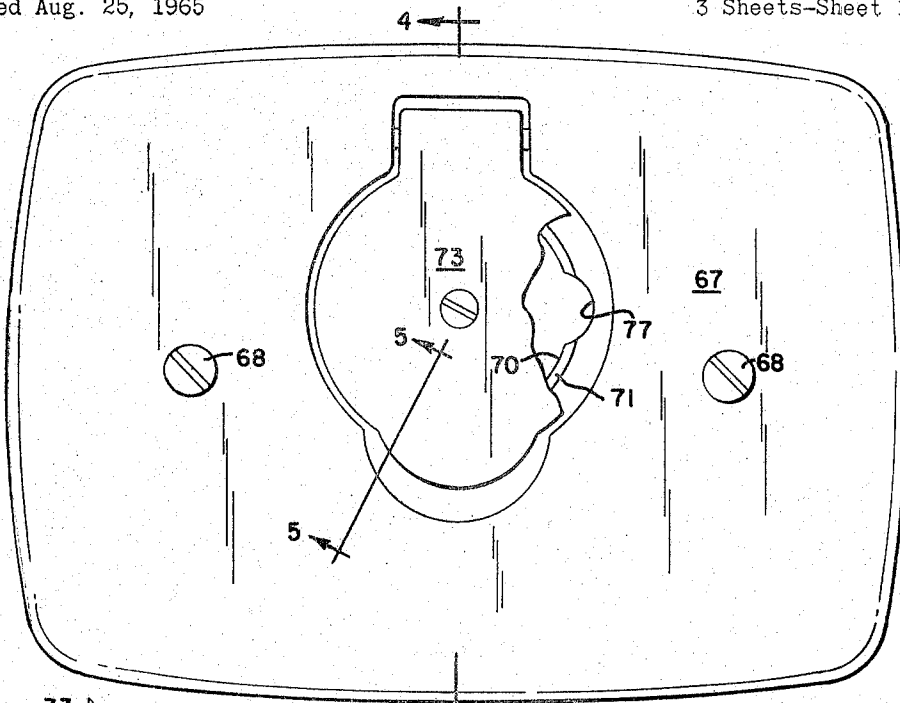


FIG. 1

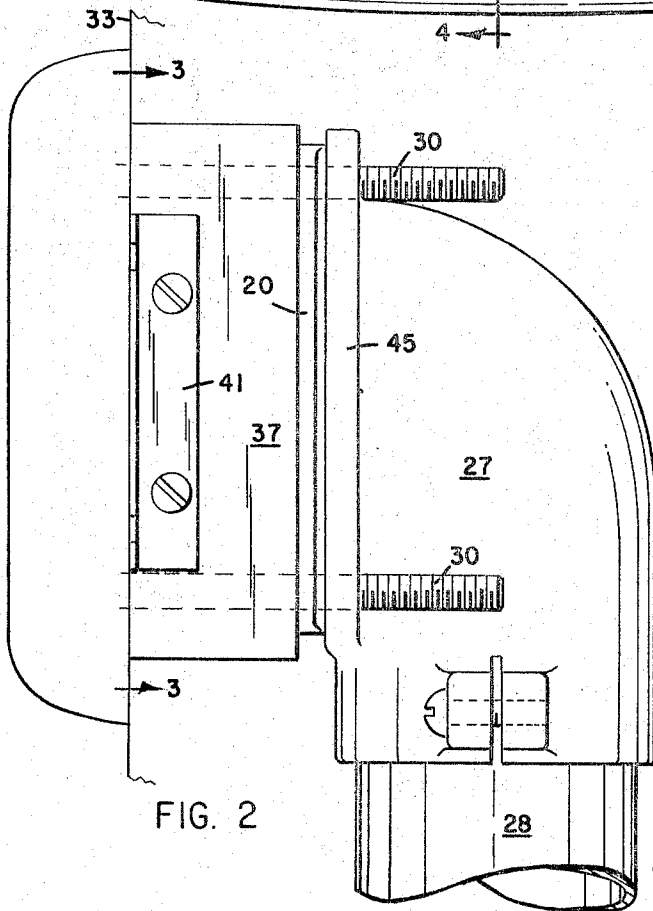


FIG. 2

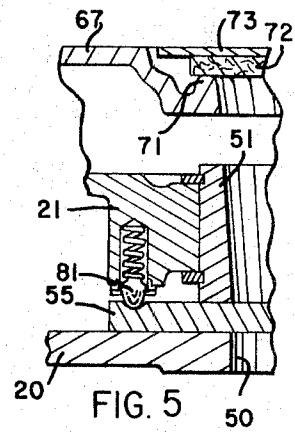


FIG. 5

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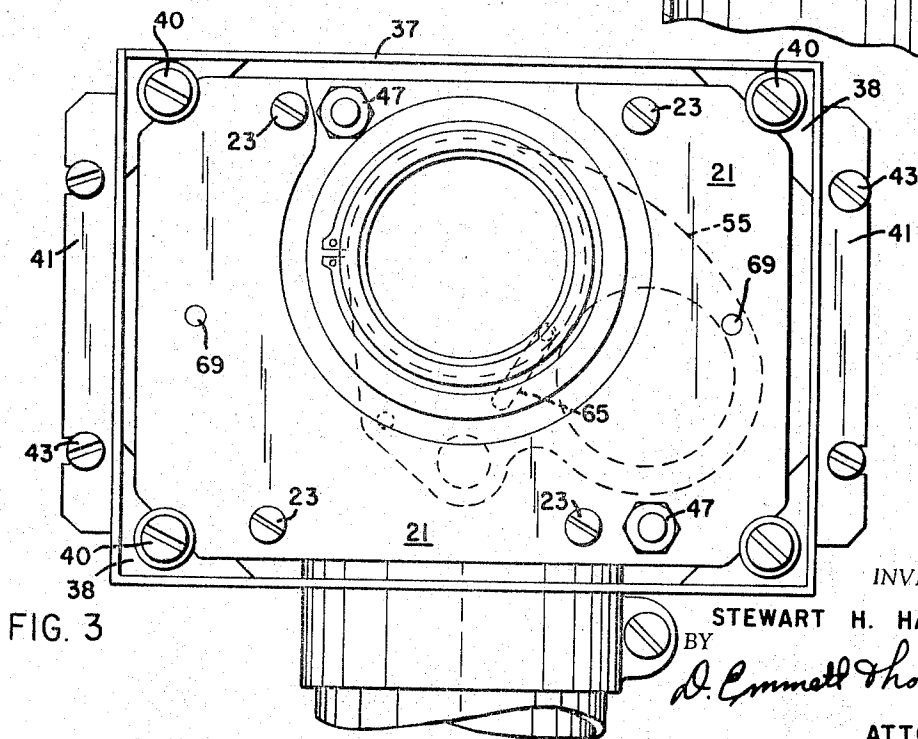
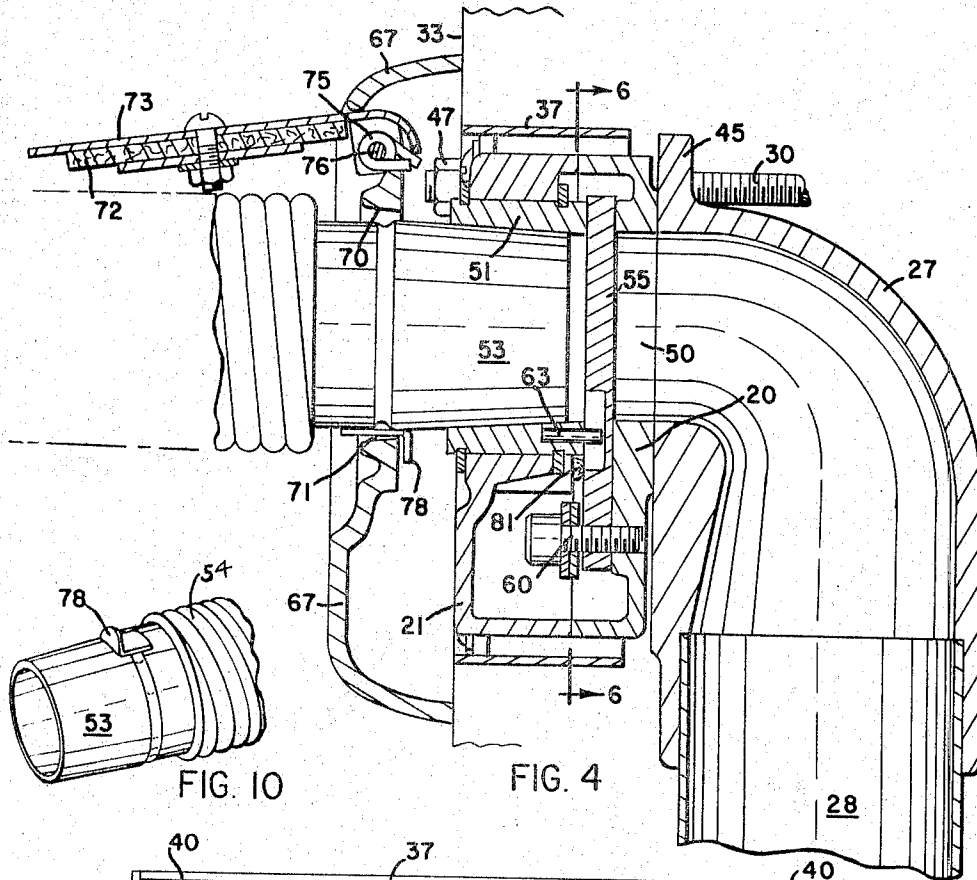
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3 Sheets-Sheet 3

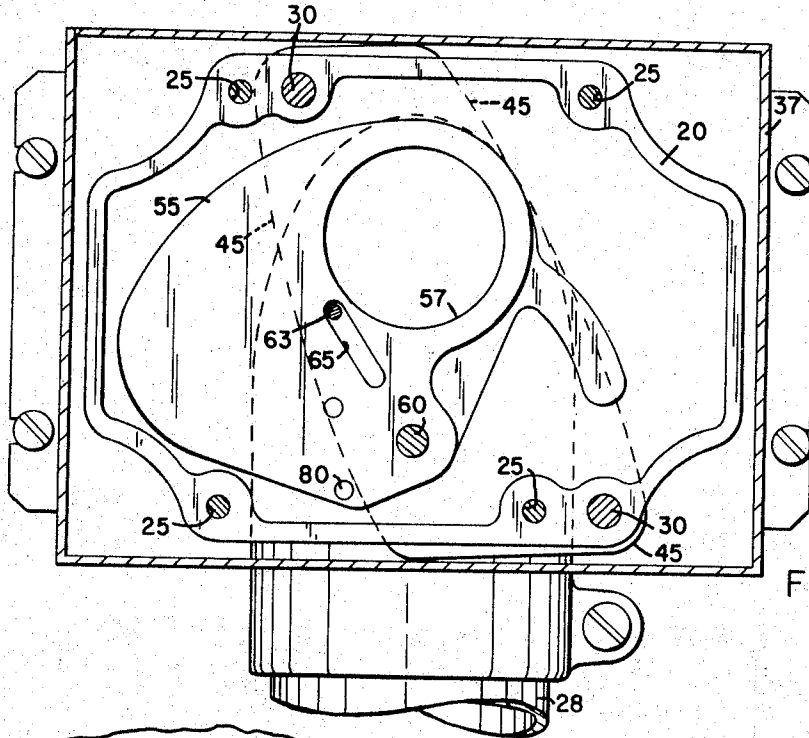


FIG. 6

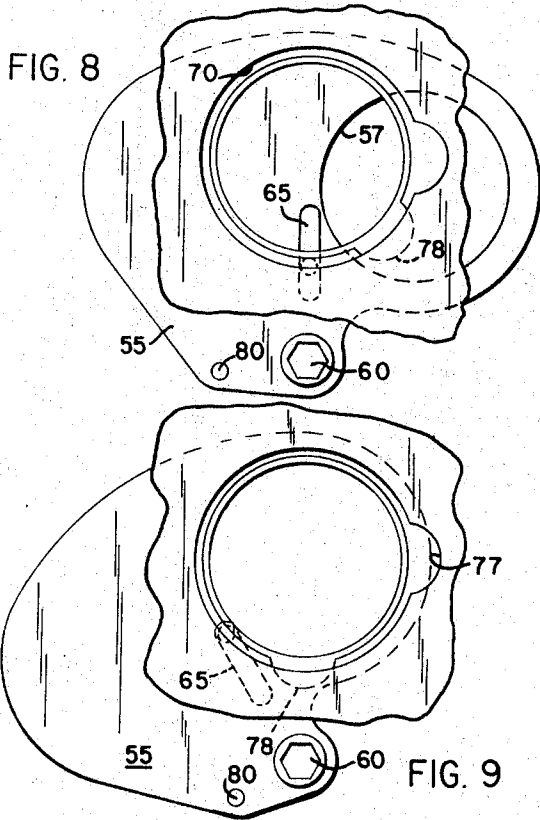


FIG. 8

FIG. 9

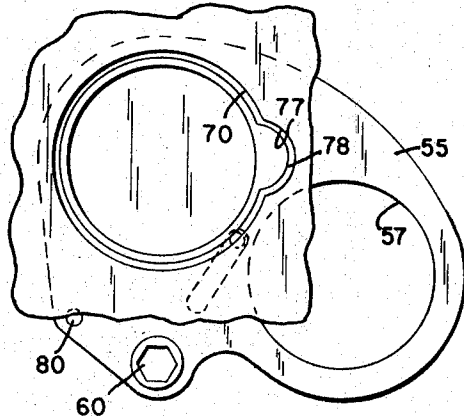


FIG. 7

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HOSE CONNECTING STRUCTURE FOR VACUUM CLEANING SYSTEMS

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Inventor: Stewart H. Hanford
 Filed Aug. 25, 1965, Ser. No. 482,540
 5 Claims. (Cl. 137-360)

This invention relates to vacuum cleaning systems of the type permanently installed in buildings, and more particularly to an arrangement for connecting the vacuum cleaning hose of the system.

The invention has as an object a wall inlet fixture embodying a structural arrangement by which a standard hose end piece can be readily and conveniently connected to the fixture. The fixture embodying a valve structure which is normally in closed position and which is moved to open position upon rotation of the inserted hose piece, and which includes means functioning to prevent withdrawal of the hose end piece until it has been rotated to move the valve to closed position.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

In the drawings—

FIGURE 1 is a front elevational view of the inlet fitting.

FIGURE 2 is a side elevational view.

FIGURE 3 is a front elevational view, with the cover plate removed, taken on a line corresponding to line 3-3, FIGURE 2.

FIGURE 4 is a vertical sectional view taken on line 4-4, FIGURES 1 and 8, showing the valve plate in partially open position.

FIGURE 5 is a fragmentary sectional view taken on line 5-5, FIGURE 1.

FIGURE 6 is a view taken on line 6-6, FIGURE 4.

FIGURES 7, 8 and 9 are fragmentary front elevational views showing the valve plate in closed, partially open, and full open, positions respectively.

FIGURE 10 is a side perspective view of a hose end piece.

The wall fixture consists of an inner plate 20, and an outer plate 21. The plates 20, 21, are secured together by screws 23 extending through the outer plate 21 and threading into apertures 25 in the inner plate 20, see FIGURES 3 and 6. The assembly of the plates 20, 21, are attached to an elbow 27 connected to a conduit 28 extending to the collection tank and vacuum pump. This connection is by way of studs 30. The elbow 27 and conduit 28 form part of the permanent piping installation usually installed upon the erection of the building. The wall line is indicated at 33, FIGURES 2 and 4. The wall is formed with an opening to receive the inlet fitting structure.

A rectangular sheet metal casing 37 is formed at its corner with internal gussets 38 threaded to receive screws 40, the heads of which overlay the corner portions of the outer plate 21, see FIGURE 3. The casing 37 may be provided on opposite sides with mounting lugs 41 secured to the casing and in turn secured to the wall, as by screws 43.

The elbow 27 is formed with a flange 45, see FIGURES 2, 4 and 6. This flange is provided with two threaded apertures to receive the studs 30 which are of extended length. These studs extend through complementary apertures in both the inner and outer plates 20, 21, and are provided

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at their outer ends with nuts 47, by means of which the assembly of the plates 20, 21 is drawn tightly against the flange 45 of the elbow 27.

The inner plate 20 is formed with an aperture 50 in registration with the passageway through the elbow 27. A sleeve 51 is journaled for rotation in the outer plate member 21, see FIGURE 4. The bore of this sleeve is tapered complementary to the taper on the standard hose end piece 53, fixed to a hose 54. Accordingly, when the end piece 53 is inserted into the sleeve 51, it engages the sleeve with appreciable friction, whereby the sleeve 51 may be rotated by rotation of the hose and end piece.

The confronting central areas of the plate members 20, 21 are recessed, or so formed, as to provide a space therebetween. A valve plate 55 is positioned in this space and is formed in one side area with an aperture 57 extending through the valve plate. The opposite side area of the valve plate is solid. The valve plate is shiftable in a direction transversely of the sleeve 51 and the aperture 50 to move the aperture 57 of the valve plate into and out of coaxial registration with the sleeve 51 and aperture 50.

As shown, the flat valve plate 55 is pivotally mounted on a stud 60 threaded into the inner plate member 20. There is motion transmitting means connecting the sleeve and the valve plate which, as shown, consists of a pin 63 mounted in the inner end of the sleeve 51 and having an end portion extending into an elongated slot 65 formed in the valve plate 55.

A cover 67 is fixedly mounted exteriorly of the outer plate member 21, as by means of screws 68 extending through the cover 67 and threading into apertures 69, see FIGURE 3, formed in the outer plate member 21. The cover 67 is formed with a central aperture 70 encircled by a flange 71 against which a gasket 72 carried on a door 73 rests when the connecting structure is not in use, see FIGURE 1. The door 73 is urged to closed position by a torsion spring 75 mounted on the door pivot pin 76.

The cover is formed with a notch 77 extending radially from one side of the aperture 70. The hose end piece 53 is formed with a radially extending projection 78. Accordingly, to effect insertion of the end piece through the aperture 70, it must be rotated to bring the projection 78 in registration with the notch 77, whereupon the end piece can be inserted snugly into the sleeve 51. With the end piece in this position, the projection 78 is positioned at the inner side of the cover 67 and thereupon, the hose end piece can be turned to effect movement of the valve plate 55 from the position shown in FIGURE 7 to the position shown in FIGURE 9. In FIGURE 8, the valve plate 55 is shown moved half way toward open position.

The outer surface of the valve plate 55 is formed with a detent depression 80, see FIGURES 6-9. A spring pressed detent 81 is mounted in the outer plate member 21 and is located to engage the detent depression 80 when the valve is in closed position, see FIGURE 5, to make certain the valve stays in that position and can not be readily moved to open position without the insertion of the end piece 53 into the sleeve 51.

It will be apparent that my hose connecting arrangement involves a simple structural arrangement, economical to manufacture, and the valve plate remains in tight closed position until after the full insertion of the hose end piece. This avoids the noisy in-rush of air when, as in conventional systems, the door 73 and its gasket are only used to provide a closure for the inlet to the vacuum system.

What I claim is:

1. A hose connecting structure for vacuum cleaning installations, inner and outer plate members mounted in a wall structure, a sleeve journaled in said outer plate

member, said inner plate member having an aperture in registration with said sleeve and communicating with a source of vacuum, a hose end piece for insertion in said sleeve for frictional engagement therewith, a valve plate mounted between said plate members, said valve plate being formed with an aperture therein, motion transmitting means connecting said sleeve and valve plate and operable upon rotation of said sleeve to shift said valve plate in a direction transversely of said sleeve to move the aperture in said valve plate into and out of registration with said sleeve and the aperture in said inner plate member, a cover fixedly mounted exteriorly of said outer plate member and having an end piece receiving aperture located in registration with said sleeve, said cover and end piece having coating means operable to prevent rotation of said end piece and sleeve during insertion or withdrawal of said end piece in and from said sleeve.

2. A hose connecting structure for vacuum cleaning systems as set forth in claim 1, wherein said sleeve is formed with a tapered bore and said hose end piece is formed with a complementary taper.

3. A hose connecting structure for vacuum cleaning installations as set forth in claim 1, wherein said valve plate has pivotal connection to one of said plate members.

4. A hose connecting structure for vacuum cleaning installations as set forth in claim 1, wherein said motion transmitting means consists of a pin and slot structure.

5. A hose connecting structure for vacuum cleaning installations including inner and outer plate members mounted in the wall structure, means for securing said plate members together with the confronting central

areas thereof being in spaced apart relation, said inner plate member being formed with an aperture communicating with a source of vacuum, a sleeve journaled in said outer plate member and arranged in axial registration with said aperture, a valve plate mounted in the space between said plate members and being formed with an aperture extending therethrough, said valve plate being shiftable to move the aperture therein into and out of registration with said sleeve and the aperture in said inner plate member, said valve plate being formed with a slot and said sleeve being provided at its inner end with a pin extending into said slot whereby, upon rotation of said sleeve, said valve plate is shifted to move the aperture therein into and out of registration with said sleeve and aperture in said inner plate, a cover fixedly mounted externally of said outer plate member and being formed with a central aperture located in registration with said sleeve for the reception of a hose end piece, said end piece and cover having coating means to prevent rotation of said end piece during insertion and withdrawal thereof in and from said sleeve.

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