April 21, 1942. L. W. PARDEE 2,280,350

SUCTION CLEANER

Filed June 17, 1940

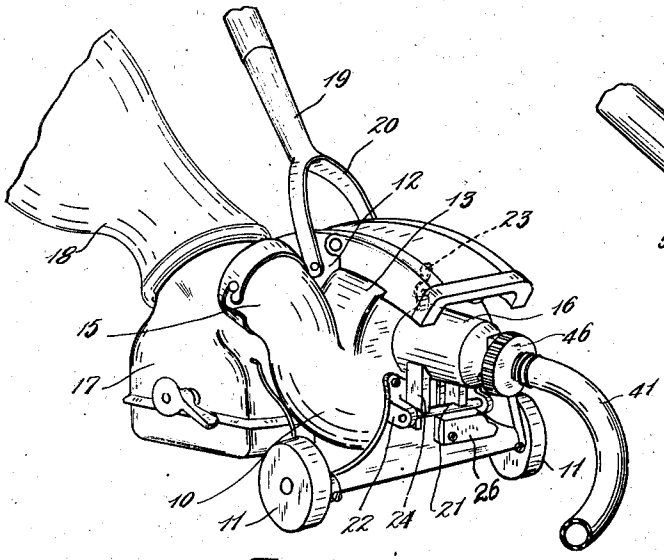


FIG. 1

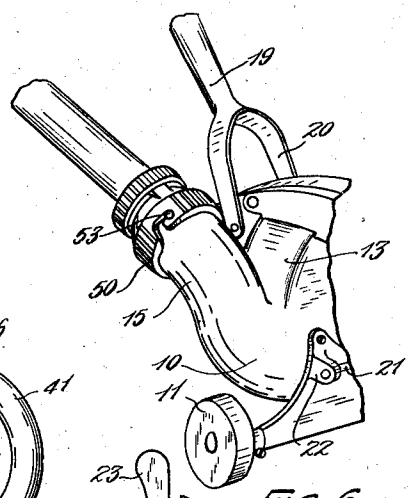


FIG. 6

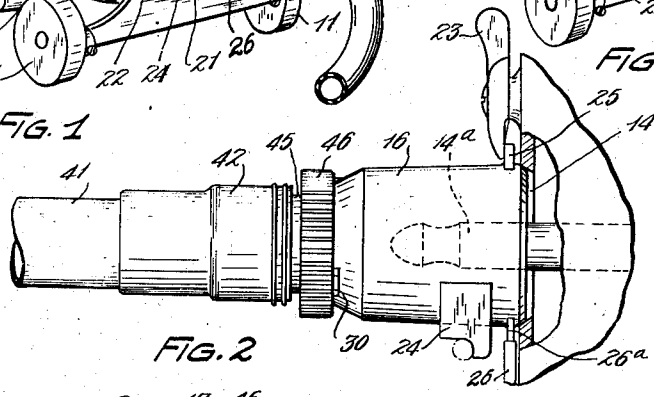


FIG. 2

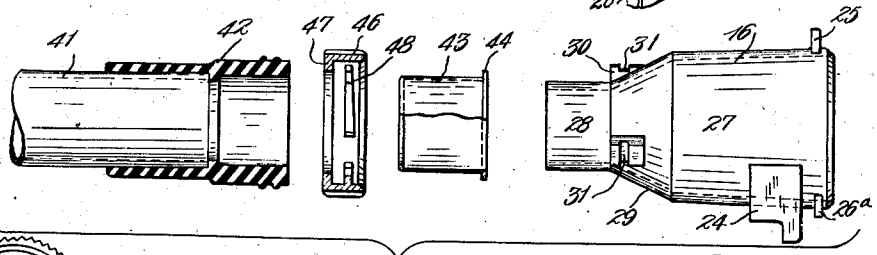


FIG. 3

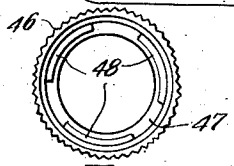


FIG. 4

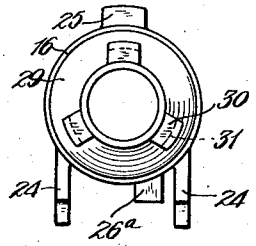


FIG. 5

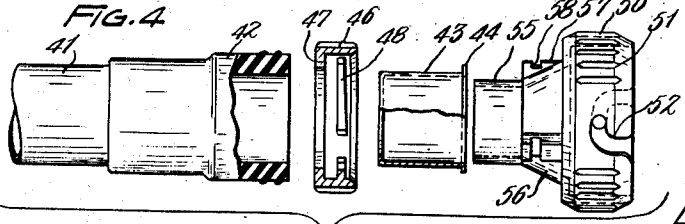


FIG. 7

INVENTOR.
LLOYD W. PARDEE
BY
Adrian Medert
ATTORNEY.

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SUCTION CLEANER

Lloyd W. Pardee, Lakewood, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio, a corporation of Ohio

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6 Claims. (Cl. 285—177)

This invention relates to electric suction cleaners of the portable type, and more particularly to a new and improved coupling device for attaching an extension hose for off-the-floor attachments to a suction cleaner.

Although various types of coupling devices have been employed heretofore for attaching an extension hose to a suction cleaner, such devices, due to their construction, embodied many undesirable features. For example, where rigid connections were used, resistance to free and unrestricted use of the hose made it difficult and inconvenient to manipulate the attachment disposed on the end of the hose. Those coupling devices which afforded relative movement between the suction cleaner and extension hose were unduly bulky, costly to manufacture, embodied a multiplicity of parts, and were inconvenient to use.

The present invention provides a new and improved coupling device for attaching an extension hose to a suction cleaner which is substantially free from the aforementioned disadvantages and undesirable features of prior devices, is relatively simple and inexpensive to manufacture. By means of a coupling device constructed according to this invention, an extension hose may be quickly and readily attached to a suction cleaner in a manner which allows the hose free rotatable movement while in use without being subject to becoming accidentally disconnected.

Various objects of the present invention will become more apparent and better understood from the following detailed description of the invention, taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a fragmentary perspective view of a suction cleaner, having an extension hose attached thereto for off-the-floor cleaning,

Figure 2 is an enlarged fragmentary side elevational view of the coupling device illustrated in Figure 1,

Figure 3 is an exploded view, partly in section, of the coupling device shown in Figure 2,

Figures 4 and 5 are details of the coupling device shown in Figure 2,

Figure 6 is a fragmentary view illustrating the coupling device employed to attach the extension hose to the outlet of the fan case of a suction cleaner for blowing purposes, and,

Figure 7 is an exploded view, partly in section, of the coupling device shown in Figure 6.

With reference to Figure 1 of the drawing, a suction cleaner of the so-called horizontal type has been selected for the purpose of illustrating, in conjunction therewith, a coupling constructed in accordance with this invention. Such a cleaner includes a casing 10 mounted on suitable wheels 11 and defining a motor housing 12 and a fan case 13, the latter having an inlet or suction opening 14 and an outlet or blower opening 15. Extending through the fan casing 13 and outwardly through the inlet opening 14 is the extension 14a of the motor shaft (Figure 2). In normal on-the-floor cleaning the inlet or suction opening 14 has attached thereto a suction nozzle (not shown) which in the illustrated embodiment has been removed to receive a converter member for attaching an extension hose to the inlet 14. The outlet opening 15 has associated therewith a dust box 17, to which is attached a filter bag 18. A propelling handle 19 is attached to the cleaner casing in some suitable way as by means of the bail 20.

In connecting an extension hose to a suction cleaner, of the type illustrated in the drawing, a converter member 16 is first attached to the front wall of the fan chamber 13 in alignment with the inlet opening 14, replacing the usual suction nozzle. For making this attachment, there is mounted on the front wall of the fan chamber, below the inlet opening 14, a transversely extending retaining bar 21 carried by a pair of spaced lugs 22 and above the opening 14, a rotatable locking nut 23. The retaining bar 21 and locking nut 23 co-operate with spaced depending lugs 24 and projection 25, respectively, formed on the converter member 16 for maintaining the same in operative position on the front face of the fan chamber. Also mounted on the front wall of the fan chamber is an electric switch 26 which is connected in the motor circuit and serves to break the circuit when the converter member 16 is detached from the wall of the fan chamber. When the converter member 16 is mounted in operative position, a depending lug 26a formed thereon is adapted to engage the actuating lever of the switch 26 and close the electrical circuit therethrough.

The converter member 16 comprises a hollow tubular body portion 27, the free end of which is received within the inlet opening 14, a tubular portion 28 of reduced diameter and an intermediate frusto-conical portion 29 connecting the two end portions 27 and 28. The tubular portion 27 is formed on approximately the same diameter as the diameter of the inlet opening 14 so that the clearance between the shaft 14a and the inlet opening 14 is maintained about the end

of the shaft which projects into the portion 27 of the converter member, permitting the free flow of material from the extension hose into the fan chamber. The outer surface of the intermediate portion 29 is provided at circumferentially spaced intervals with radially extending bosses 30 having transversely extending slots 31 therein.

The extension hose 41 terminates in a rubber sleeve 42 which is adapted to telescopically receive a sleeve 43. The sleeve 43 is formed with an outwardly extending flange 44 on the end thereof, which, when the sleeves are assembled, co-operates with end of sleeve 42 to define a channel 45.

A coupling ring 46 provided with an annular inwardly turned flange 47 is rotatably mounted on the sleeve 43 with the flange 47 disposed in channel 45. The inner surface of the coupling ring is provided with spaced inwardly extending cam elements 48. The cam elements are spaced at intervals about the coupling ring slightly greater than the width of the bosses 30 formed on the converter member, so that the same may be received therebetween. The cam elements 48 are so formed as to be wedgedly received within the slots 31 of the bosses 30 on the converter member 16, each cam element 48 is slightly tapered in the same direction, the narrow ends thereof being adapted to enter into the adjacent slots 31 when the ring and converter member are assembled. The tubular portion 28 of the converter member is telescopically received within the sleeve 43, sufficient clearance being provided to permit rotative movement therebetween.

When it is desired to attach the extension hose 41 to a vacuum cleaner of the type described for purposes of blowing, the dust box 17 and filter bag 18 are disconnected from the outlet 15 of the fan casing and replaced with a converter member 50. The converter member 50 is provided with an enlarged tubular end 51 provided with bayonet slots 52. The end 51 is adapted to fit over the outlet 15 and is secured thereto by means of the pins 53 (Figure 6) engaging within the bayonet slots 52. The converter member 50 is formed with a tubular sleeve 55 of reduced diameter which is connected to end 51 by the intermediate portion 56. Similar to the intermediate portion 29 of the converter member 16, the portion 56 of member 50 is provided at circumferentially spaced points with radially extending bosses 57 having transversely extending slots 58 which are adapted to receive the cam elements 48 of the ring 46 to lock the ring and converter members together.

Having fully described my invention so that anyone skilled in the art may understand and practice the same, what I desire to obtain by letters patent will be set forth in the appended claims.

I claim:

1. A rotatable coupling for attaching an extension hose to a suction cleaner comprising a flanged sleeve secured in the end of the hose with the flange thereof spaced from the end surface of the hose, a coupling ring with an inwardly turned annular shoulder about one end thereof rotatably mounted on the sleeve between the flange of the sleeve and the end surface of the extension hose, a converter member adapted to be secured to the suction cleaner, said converter member having radially extending slots with circumferentially extending bosses therein, said coupling ring having tapering cam elements adapted to frictionally engage within the slots in the bosses for removably securing the members together, one end of the suction cleaner converter member being provided with a tubular extension which reposes in said sleeve when the coupling ring is attached to the converter member whereby said hose is freely rotatable with respect to said coupling ring and converter member.

2. A rotatable coupling for attaching an extension hose to a suction cleaner comprising a flanged sleeve secured in the end of the hose with the flange thereof spaced from the end surface of the hose, a coupling ring with an inwardly turned shoulder about one end thereof rotatably mounted on the sleeve between the flange of the sleeve and the end surface of the extension hose, a converter member adapted to be secured to the suction cleaner, said converter member being formed with a tapered intermediate portion having radially extending bosses with circumferentially extending slots therein, said coupling ring having tapering cam elements adapted to frictionally engage within the slots in the bosses for removably securing the members together, one end of the suction cleaner converter member being provided with a tubular extension which reposes in the sleeve when the coupling ring is attached to the converter member whereby said hose is freely rotatable with respect to said coupling ring and converter member.

3. The combination with a suction cleaner including a housing enclosing air flow producing means and an extension hose for attachments, of coupling means for connecting said extension hose and housing for relative rotary movement therebetween, said coupling means comprising a converter member adapted to be removably attached to the housing and having spaced outwardly extending bosses with circumferentially extending slots, a sleeve having an external flange thereon and adapted to be received within the end of the extension hose, a coupling ring encircling said sleeve and formed with an inturned flange at one end thereof, and means formed on the inner surface of the ring for cooperating with the slots in said bosses to lock the ring and converter member together in a predetermined fixed position to define a channel between the flange of the coupling ring and the outer free end of said bosses, in which channel the external flange of said sleeve is freely rotatable.

4. The combination with a suction cleaner including a housing enclosing air flow producing means and an extension hose having a flanged end portion, of coupling means for connecting said hose and housing for relative rotary movement therebetween, said coupling means comprising a converter member adapted to be removably attached to the housing and having spaced outwardly extending bosses with circumferentially extending slots formed therein, a coupling ring encircling said converter member, and cam members formed on the inner surface of the ring adapted to engage within said bosses to lock the ring and converter member together to form a channel therebetween, said converter member adapted to receive telescopically the end of the extension hose with the flanged end portion freely rotatably disposed within said channel.

5. The combination with a suction cleaner including a housing enclosing air flow producing means and an extension hose having a flanged end portion, of coupling means for connecting

said hose and housing for relative rotary movement therebetween, said coupling means comprising a converter member having a tubular portion adapted to be removably attached to the housing, outwardly extending bosses having circumferentially extending slots formed on the tubular portion of said converter member, a coupling ring adapted to encircle said tubular portion and formed with an inturned flange at one end thereof, and tapered lugs formed on the inner surface of the ring for frictionally engaging within the slots of said bosses to lock the ring and converter member together in a predetermined fixed position, said ring and converter member when assembled defining a channel in which the flanged end portion of the hose is rotatably received.

6. The combination with a suction cleaner including a housing enclosing air flow producing means and an extension hose having a flanged end portion, of coupling means for connecting said hose and housing for relative rotary movement therebetween, said coupling means comprising a converter member having a tubular portion adapted to be removably attached to the housing, outwardly extending bosses having circumferentially extending slots spaced around the tubular portion of said converter member, a coupling ring encircling said converter member and having members formed thereon adapted to frictionally engage within the slots in said bosses to lock the ring and converter member together in a predetermined fixed position to form a channel therebetween, said converter member adapted to rotatably and telescopically receive the end of said hose with the flanged end portion thereof disposed within said channel.

LLOYD W. PARDEE.