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SUCTION CLEANER AND ATTACHMENT THEREFOR

Filed March 14, 1929

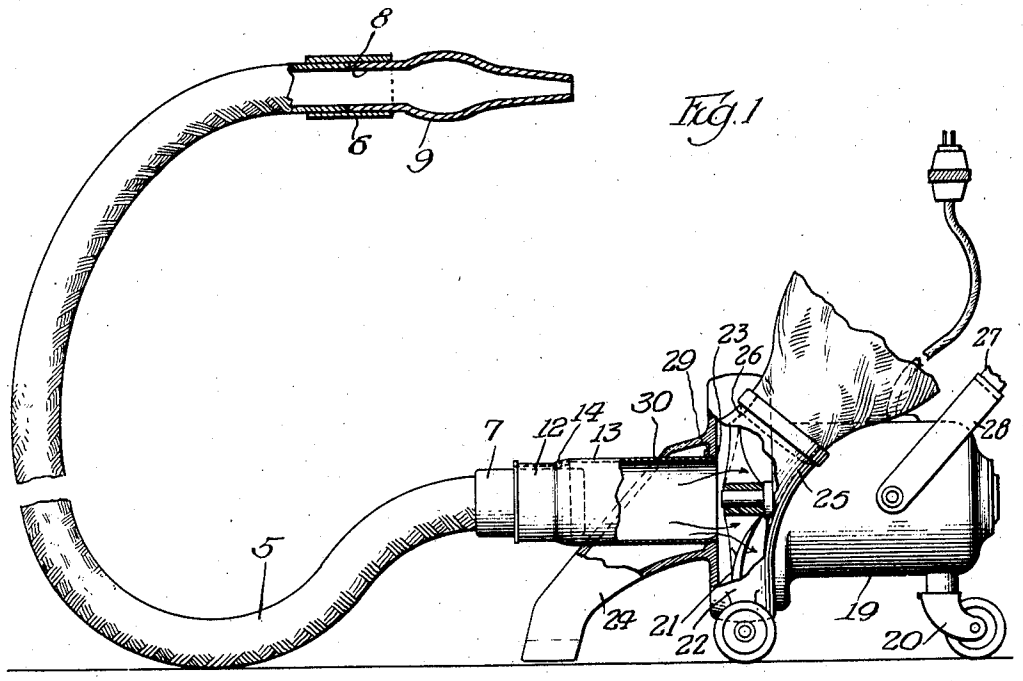


Fig. 1

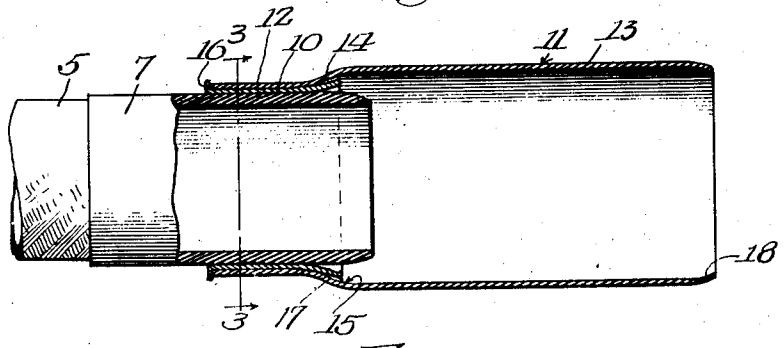


Fig. 2

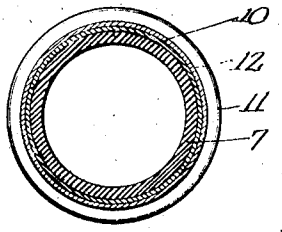


Fig. 3

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UNITED STATES PATENT OFFICE

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SUCTION CLEANER AND ATTACHMENT THEREFOR

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The present invention relates generally to suction cleaners of the portable or household type and more particularly to hose attachments for such cleaners.

In the use of suction or vacuum cleaners, it is now common practice, when cleaning upholstered furniture and other such articles that are not capable of being cleaned by use of the cleaner in the ordinary manner, to employ an attachment consisting of an elongated flexible tube or hose which is provided at one end thereof with a suction nozzle and has a coupling member at the other end whereby it may be connected directly to the suction opening of the fan casing of the cleaner. The attachment is used by inserting the coupling member into the suction opening or otherwise connecting said member to the fan casing. When the attachment is in its connected position, the fan, during drive thereof, causes suction to be created in the hose instead of the usual floor nozzle and renders operative the hand nozzle at the distal end of the hose. This hand nozzle by virtue of the fact that it is mounted on a flexible hose, is readily movable over the parts to be cleaned while the cleaner is stationary or remains at rest upon the floor. Heretofore it has been customary in the manufacture of suction cleaner attachments of this character to connect the hose and coupling member rigidly together. In practice, it has been found that as a result of this arrangement the hose sometimes breaks or becomes injured adjacent the coupling member and the cleaner is often overturned as a consequence of the usual twisting or turning of the hand nozzle during manipulation of the latter.

One object of this invention is to provide a hose attachment for a suction cleaner, in which the coupling member and hose are connected together for relative rotation. By connecting the coupling member and hose in this manner, the life of the attachment is materially prolonged inasmuch as the hose, when used with a cleaner, can not be twisted by turning the hand nozzle. In addition, this rotary arrangement of the coupling member prevents turning movement of the hand nozzle from tipping over the cleaner.

Another object of the invention is to provide an improved swivel connection between the hose and the coupling member, embodying a sheet metal sleeve or ring which is rotatable within one end of the coupling member and has flanged end portions operating in conjunction with shoulders on said coupling member to form an effective and efficient seal between the two parts and to prevent relative axial displacement.

A further object of the invention is to provide a hose attachment having means for couplement with the fan casing of a suction cleaner, which means is of new and improved construction and may be produced at a low and reasonable cost.

Other objects of the invention and the various advantages and characteristics of the present construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly described by the claim at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a partial sectional and side elevational view of a hose attachment embodying the invention, showing the same in connected relation with a vacuum cleaner;

Figure 2 is a longitudinal section of the coupling member and sleeve, disclosing in detail the correlative arrangement and specific construction of these two parts; and

Figure 3 is a transverse section taken on the line 3—3 of Figure 2.

The invention is exemplified in a hose attachment for use with vacuum or suction cleaners. This attachment is adapted to be used when it is desired to clean by suction articles that can not ordinarily be cleaned by the usual floor nozzle of the cleaner. It comprises an elongated flexible hose 5 which has a pair of short rubber nipples 6 and 7 connected to the ends thereof respectively. The hose 5 is formed of rubber, woven fabric

coated with rubber or any other suitable material that flexes easily. The nipple 6 has one end thereof cemented or otherwise rigidly secured to the hose. The other end of this nipple is adapted to be sleeved over the tubular stem 8 of a hand nozzle 9 so as to connect removably the nozzle to the hose. The nozzle 9 is adapted to be held in the hand and manipulated back and forth to effect the desired cleaning, as well understood in the art. The nipple 7 is cemented or secured to the hose similarly to the nipple 6 and is adapted to be connected to the suction opening of the cleaner by means of a sleeve or ring 10 and a one-piece coupling member 11. The last mentioned of these two parts is formed of sheet metal and is circular in cross section throughout its entire length. It consists of a cylindrical end portion 12 and a cylindrical end portion 13 which is of a somewhat larger diameter than the portion 12 and is connected to the latter by an annular inclined wall 14. This inclined wall forms a conoidal shoulder 15 adjacent the interior of the coupling member 11. The sleeve 10, like the coupling member 11, is formed in one-piece and of sheet metal. It is substantially cylindrical and is shellacked or otherwise rigidly secured around the outer end portion of the nipple 7. The sleeve 10 is substantially coextensive with the reduced end portion 12 of the coupling member 11 and fits loosely therein so as to be capable of relative rotary movement. One end of the sleeve 10 is deflected outwardly to form a radially extending annular flange 16 which is adapted to abut against the end edge of the portion 12 to form a seal and to prevent the sleeve, together with the nipple 7, from inward movement with respect to the coupling-member 11. The other end of the sleeve 10 is flared outwardly to form a substantially conoidal flange 17 which is adapted to abut against the shoulder 15 to limit outward movement of the sleeve and the rubber nipple associated therewith. The flanges 16 and 17, together with the coacting shoulder portions of the coupling member 11, exemplify means of an improved character for preventing axial displacement of the sleeve 10 relatively to said coupling member. The sleeve 10 is manufactured so that prior to the assembly operation it has but the flange 16. In this form it is inserted into the end portion 12 of member 11 and then the flange 17 is formed by spinning or deflecting outwardly the inner end of the sleeve by the use of a suitable die or tool. The nipple 7 is assembled by applying shellac thereto and then forcing it through the sleeve 10 after the latter has been connected to the coupling member. The sleeve 10 is in the nature of a swivel member and permits the hose 5 to be turned or twisted during use of the nozzle 9 without imparting such turning movement to the coupling member and vacuum cleaner with the result that the life of the hose is materially prolonged. To prevent binding of the sleeve and coupling member, the flanges 16 and 17 are spaced apart so as to permit the sleeve to move axially a limited distance.

The outer end of the cylindrical portion 13 of the coupling member is spun or deflected inwardly so as to form a tapered flange 18 for use in connecting the coupling member to the fan casing of the vacuum cleaner. The cleaner illustrated in the drawing comprises a housing 19 which encloses the usual electric motor (not shown) and is mounted on casters or wheels 20 so that it may be moved bodily back and forth over the work or floor; a fan 21 which is connected to the armature shaft of the electric motor; a casing 22 which houses the fan and has a circular suction opening 23 at the front thereof; a floor nozzle 24; a bag nipple 25 which has an outlet or exhaust port 26; and an operating handle 27 which is pivotally connected to the structure 19 by a yoke 28. The bag nipple is offset with respect to the fan casing 22 and the exhaust port therein operates to convey the air and dust drawn inwardly through the suction opening 23 to the bag. The portion of the wall which forms the circular suction opening 23 is shaped to form a tapered seat 29 for receiving the flange 18 of the coupling member 11. The wall of the bag nipple 25 that surrounds and forms the port 26 is likewise shaped to form a tapered seat so that the coupling member may be applied to said bag nipple in the event that the attachment is to be used as a blower. An oval shaped opening 30 is formed in the front wall of the floor nozzle 24 to permit the coupling member 11 to be inserted into place (see Figure 1). This opening is normally closed by a plate (not shown) so that the fan during the normal operation of the cleaner operates to suck air and dust through the proper intake conduit of the floor nozzle. The opening 30 is of such a character that the surrounding wall engages the sides of member 11 to support the latter and hold the same when it is in its connected position. The end portion 13 is preferably twice the length of the portion 12 so it is of sufficient length to extend readily through the floor nozzle 24.

The attachment is applied to the cleaner by first removing the plate that closes the opening 30. The coupling member 11 is then slid through this opening and forced inwardly until the tapered flange 18 is jammed into frictional engagement with the seat 29. When the switch for the motor is closed, the fan is rotated and causes suction to be created in the hose 5 instead of through the floor nozzle. During such operation the suction nozzle 9 at the distal end of the hose

may be used to clean articles that are disposed above the floor and of such character that they could not be cleaned readily by use of the cleaner in its customary or usual manner. While the attachment is being used, the sleeve 10 is free to swivel within the end portion 12 of the coupling member and consequently turning movement of the hand nozzle 9 does not cause the hose 5 to be twisted or the cleaner proper to be overturned. In the event that it should be desired to use the attachment as a blower instead of a suction cleaning device, the bag is removed from the nipple 25 of the cleaner and the coupling member 11 is shifted into engagement with the tapered seat around the exhaust port 26.

The means disclosed herein for effecting couplement of the hose and cleaner consists essentially of but a small number of parts and consequently may be manufactured at a low and reasonable cost.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claim, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

An attachment for a suction cleaner, comprising a flexible hose having one end thereof adapted for connection to a nozzle, and means for effecting couplement of the other end of the hose and the cleaner, consisting of a coupling member and a sheet metal sleeve, the coupling member having cylindrical end portions of different diameters connected together by an annular shoulder-forming wall, the sleeve being secured fixedly to the said other end of the hose and mounted rotatably in the end portion of the coupling member of smaller diameter and having outwardly deflected end flanges cooperating with the end edge of the smaller end portion and the shoulder-forming wall respectively to prevent axial displacement of the sleeve relatively to said coupling member.

Signed at Racine, Wisconsin this 2nd day of March, 1929.

EMANUEL NIELSEN.