Feb. 5, 1935. H. KESSLER 1,989,868

VACUUM CLEANER

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Fig. 2.

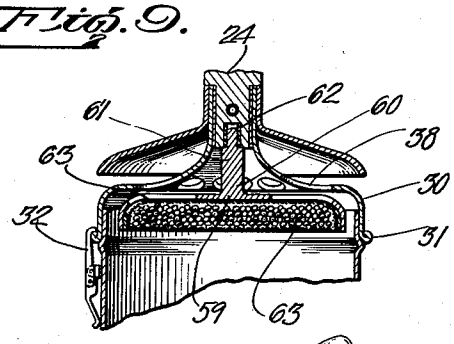


Fig. 1.

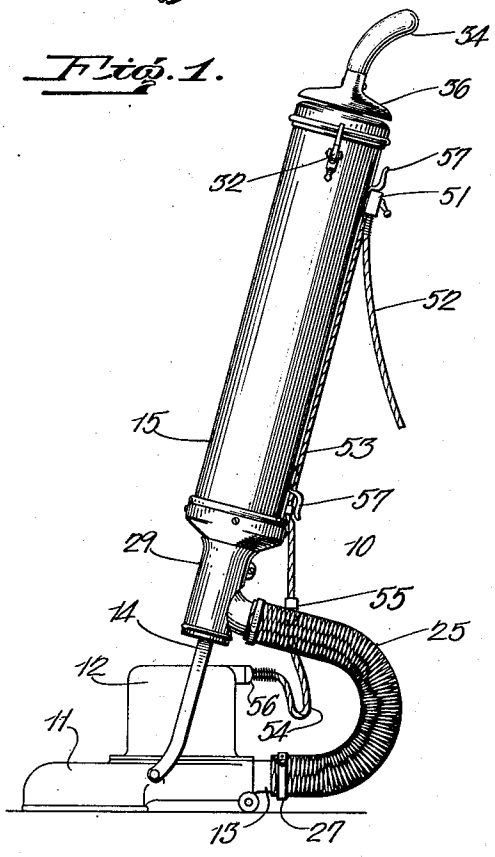


Fig. 4.

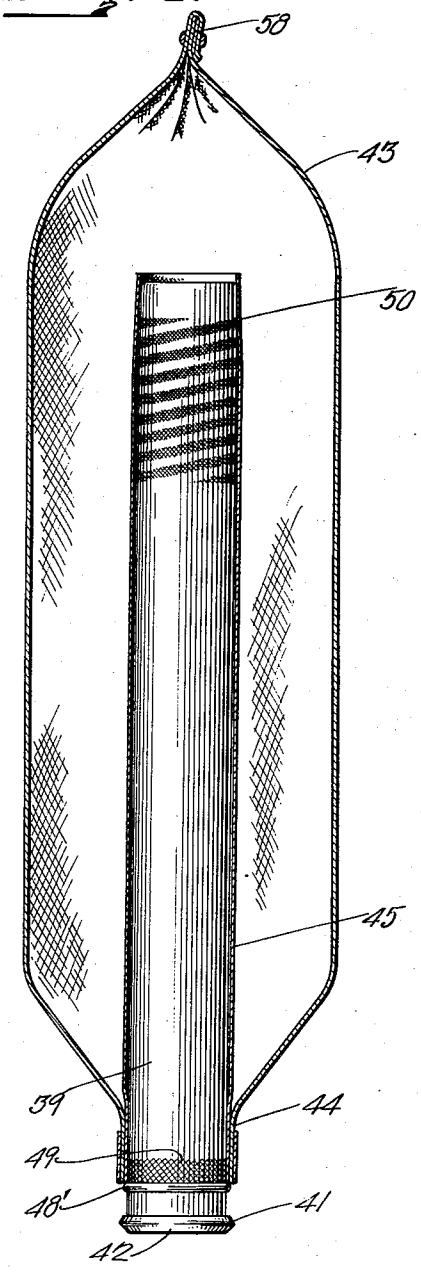
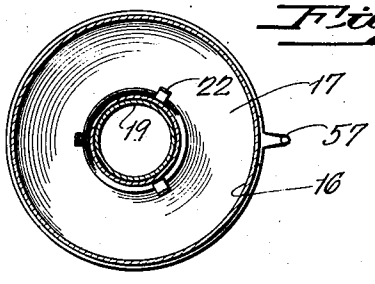


Fig. 3.



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VACUUM CLEANER

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Fig. 2.

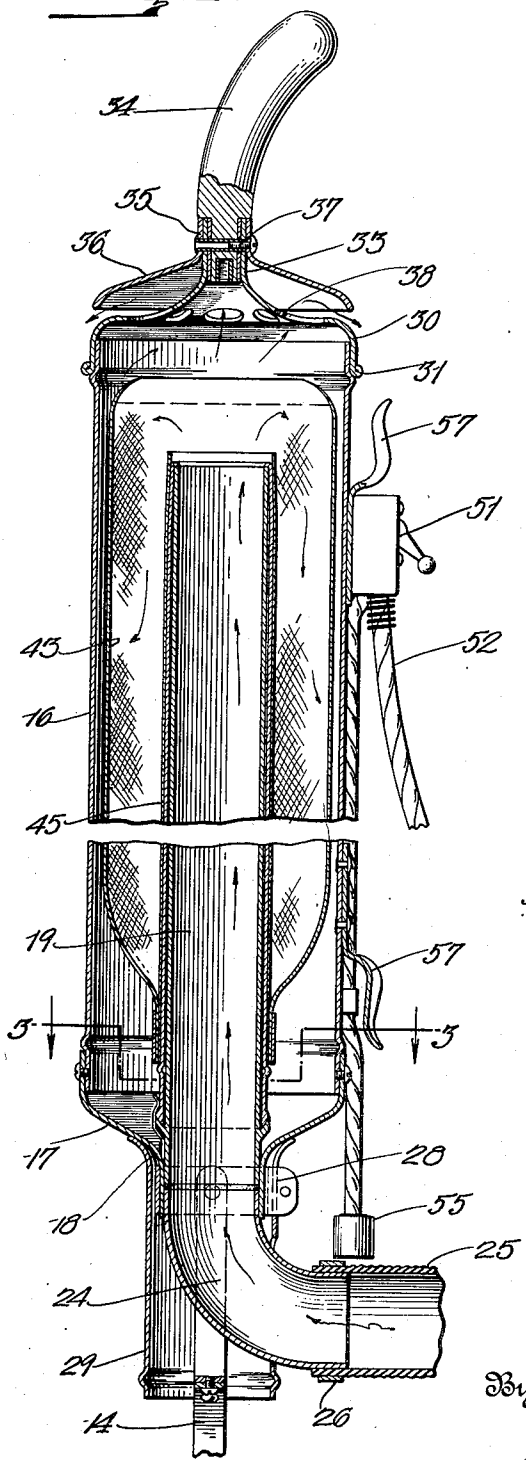


Fig. 5.

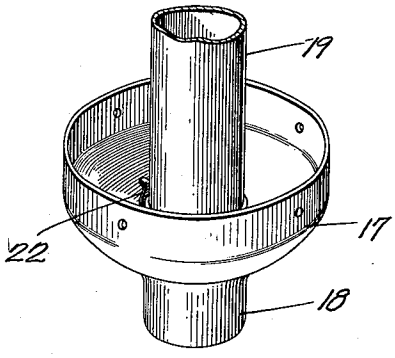
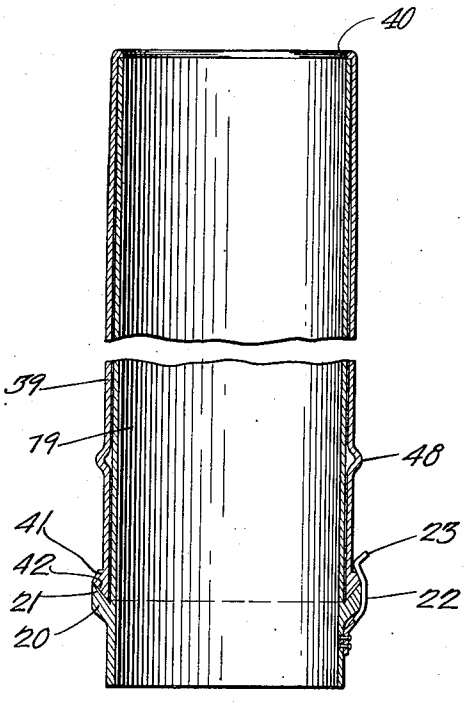


Fig. 6.



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Fig. 7.

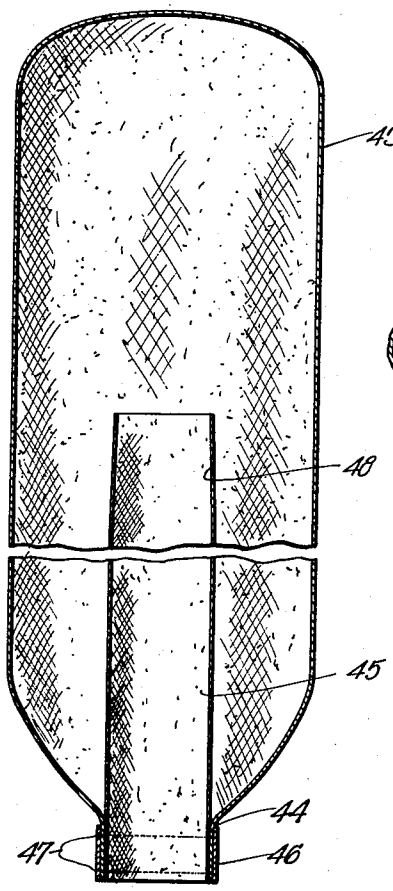


Fig. 8.

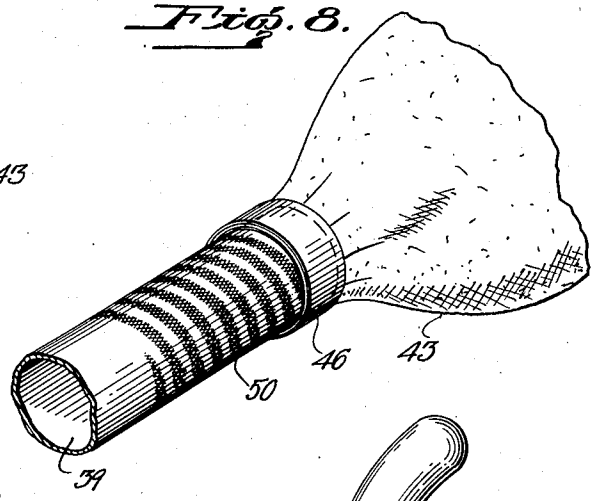


Fig. 10.

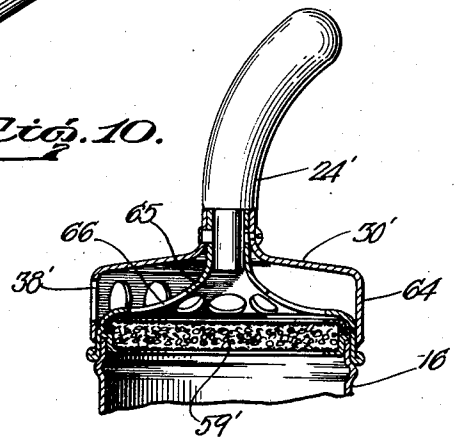


Fig. 11.

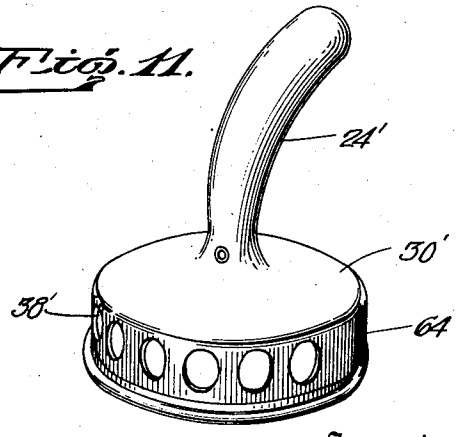
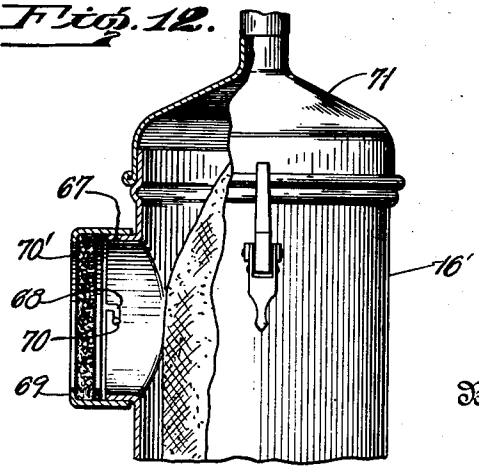


Fig. 12.



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1,989,868

VACUUM CLEANER

Harry Kessler, Brooklyn, N. Y.

Application April 16, 1932, Serial No. 605,584

6 Claims. (Cl. 183—51)

This invention relates to improvements in vacuum cleaners.

One of the features of the invention is to dispense with the usual type of dust collecting bag generally used in connection with vacuum cleaners by providing a cylindrical dust collector and utilizing the cylinder as a handle for the device.

Another feature of the invention is to provide a vacuum cleaner having a high efficiency for filtering and trapping dust and dirt drawn thereinto to avoid the objection of fine particles of dust escaping from the device and settling upon the furniture of a room when cleaning the same by use of a vacuum cleaner.

A further object of the invention is the provision of a vacuum cleaner which includes a removable filtering bag into which dust and dirt is drawn and trapped, and which is convenient and sanitary to empty, dispose of or replace without danger of spilling the accumulated dust and dirt.

A still further object is to provide a vacuum cleaner which is simple of construction, light in weight, easy to disassemble and assemble when in use, strong and durable for the uses intended, and inexpensive of manufacture.

With these and other objects in view, the invention resides in the certain novel construction, combination and arrangement of parts, the essential features of which are hereinafter fully described, are particularly pointed out in the appended claims, and are illustrated in the accompanying drawings, in which:

Figure 1 is a side elevational view of my improved vacuum cleaner.

Figure 2 is an enlarged longitudinal sectional view of the same.

Figure 3 is a horizontal sectional view on the line 3—3 of Figure 2.

Figure 4 is a detail vertical sectional view through the filtering bag associated with its supporting tube.

Figure 5 is a detail fragmentary perspective view of the lower end of the air exhaust tube.

Figure 6 is an enlarged fragmentary vertical longitudinal sectional view through the air exhaust tube and its telescoping filter bag tube support.

Figure 7 is an enlarged fragmentary vertical sectional view through the filter bag, per se.

Figure 8 is a detail perspective view showing the manner in which the filter bag is removed or inserted upon its supporting tube.

Figure 9 is a detail vertical sectional view through the cylinder cap showing the manner in which a deodorizer may be supported therein.

Figure 10 is a detail sectional view of a modified form of cap and deodorizer.

Figure 11 is a detail perspective view of the cap shown in Figure 10.

Figure 12 is a sectional elevational view of a further modification of air exhaust and deodorizer.

Referring to the drawings by reference characters, the numeral 10 designates my improved vacuum cleaner in its entirety, which includes a portable floor tool 11 of the conventional construction which includes an electric motor 12 for creating a suction within the floor tool 11, the air drawn into the tool being expelled through a discharge nipple 13. Pivotally connected to opposite sides of the floor tool 11 is a yoke 14 to which my combination dust receiver and handle 15 is fixedly connected, the details of which will now be fully explained.

The dust receiver 15 includes a rigid cylindrical or other desired shaped casing 16 made of metal or other like material, which is substantially the same diameter throughout its length and open at opposite ends. Fixed to the lower end of the cylindrical casing 16 is an end cap 17 formed with an annular collar or nipple 18. Fixed within the collar 18 and rising centrally within the cylindrical casing 16 is an air exhaust tube 19, the same terminating short of the upper or outer open end of the casing. The lower end of the exhaust tube 19 is provided with an annular shoulder 20, the upper face of which is formed with an inwardly beveled seat 21, while fixed to the tube 19 below the shoulder or flange 20 are spring catches 22 which extend upwardly beyond the shoulder 20 and terminate in angular lips 23 for a purpose to be presently explained.

Also extending into the nipple or collar 18 is one end of a right angle elbow pipe 24, the other end of the pipe having one end of a flexible hose 25 secured thereto by means of a hose clamp 26. The hose 25 is of such construction as to avoid kinking in order to maintain a uniform internal diameter at all times, and has its opposite end fixedly attached to the exhaust nipple 13 by a hose clamp 27. A collar 28 encircles the nipple 18 to which the yoke 14 is connected, while a tubular skirt 29 encloses a portion of the elbow pipe 24 and the nipple end of the end cap 17.

Removably fitting upon the outer or top end of the cylindrical casing 16 is a cap 30 provided with a circumferential bead 31 which is engaged by releasable clamps 32 whereby the cap may be securely fastened in position, or by releasing the clamp, the said cap may be removed for facilitating access to the interior of the cylindrical casing 16. The top of the cap 30 is curved inwardly and upwardly, terminating in a collar 33 which telescopes the reduced end of a hand grip 34. Fitting about the collar 33 is the collar 35 of a deflector member 36 which is mounted in spaced relation with the top wall of the cap 30. Suitable fastening means 37 passes through the reduced

portion of the handle 34 and the collars 33 and 35 for securing these parts in fixed relation.

The top wall of the outer end cap 30 is provided with a series of air exhaust openings 38 through which air from within the cyinder 16 is exhausted to the atmosphere. The combined area of air exhaust openings is equal to or greater than the area of the opening in the nipple 13.

Telescoping the air exhaust tube 19 is a filter bag supporting or holding tube 39, the upper end of which is slightly tapered and terminates in an inwardly extending annular bead or shoulder 40. The lower or opposite end of the tube 39 terminates in a flange 41 provided with a beveled seat 42 for seating engagement upon the seat 21 of the shoulder or flange 20 of the inner tube 19. When the outer tube 39 is dropped over the inner tube 19, the outer tube will automatically seat itself and is held in such position by the spring catches 22, the beveled seat 42 striking the angular lip 23 to automatically move the spring catches outwardly, after which the catches engage the flange 41.

Associated with and held by the tube 39 is a dust collecting bag and air filter 43, the same being constructed of paper or other substance which will permit of the escape of air through the walls thereof but will prevent the passage of dust particles therethrough. The bag 43 is formed with an open neck 44 while fixed within the neck and rising upwardly into the body of the bag is a tube 45 constructed of the same material as the bag body, or any other like material. The material from which the bag is constructed although being sectional is sufficiently stiff to avoid collapsing after inflation. Encircling the neck 44 is a reinforcing collar 46, while circumferential rows of stitching 47 pass through the collar, neck 44, and lower end of the tube 45 for securing the parts together. Although stitching has been shown it is understood that any other fastening means may be resorted to if desired. The tube 45 of the bag extends upwardly to a point approximately two-thirds of the length of the bag and terminates in an inwardly tapered portion 48.

The tubular portion 45 of the filter bag telescopes the tubular pipe section 39 as best seen in Figure 4 of the drawings, and the lower end of the said pipe section adjacent the shoulder 41 is formed with a bead or stop flange 48' adjacent to which the exterior of the tube is formed with a milled surface 49 to be frictionally engaged by the lower end of the filter tube 45. The upper end of the tube 39 has its exterior periphery formed with a spiral milled surface 50, the same terminating adjacent the top end of the tube and serving two purposes, namely, a means for facilitating the easy insertion or removal of the filter bag upon the pipe as illustrated in Figure 8 of the drawings, and as a means by which a firm grip may be obtained by grasping the top of the bag 43 and compressing the same about the tube 39 to enable the removal of the bag and tube 39 from within the cylindrical casing 16 when it is desired to empty the contents of the bag or to replace a used bag by a new one. The upper tapered end 48 of the tube 45 extends slightly above the top end of the tube 39 but coacts with the tapered end of the tube 39 for a tight frictional fit.

Mounted on the side of the cylindrical casing 16 is a manually operated electric switch 51 to which an electrical attachment cord 52 connects, while extending from the switch 51 and held close to the exterior of the casing 16 is an electric cord 53 connected to a cord section 54 by an electric male and female connector 55. The cord 54 carries a plug 56 for connection with the electric motor 12 of the vacuum floor tool 11. Spaced clips 57 are mounted on the side of the cylindrical casing 16 around which the attachment cord 52 may be wound when the device is not in use.

In practice, assume that the various parts are in the position shown in Figure 2 of the drawings, and the attachment cord 52 is connected with a source of electric supply, and the switch 51 is turned on in order to place the motor 12 in operation which produces a suction within the floor tool 11 which expels the air through the nipple 13, hose 25 and causes a column of air to rise upwardly into the air exhaust tube 19. The air after passing through the open top of the tube 19 enters the body of the filtering bag 43 which air of course puffs out the bag but only to an extent that the walls of the bag are disposed in spaced relation with respect to the inner walls of the cylindrical casing 16. The air when entering the bag is of course filled with particles of dust and dirt, which are trapped within the bag and accumulate in the space between the tube 45 of the bag and the walls of the body thereof. The air escapes through the pores of the bag body and passes out through the exhaust openings 38 as shown by the arrows in Figure 2 from where the air is deflected by the deflector plate 36 to cause the same to be directed downwardly of the cylindrical casing 16. The dust collecting and filtering means operates on the principle that the air and dust passing upward through the air tube 19 is confined within said tube and the air velocity therethrough is evenly maintained until the air and dust is exhausted into the bag, at which time the velocity is dissipated or reduced due to the enlarged space, thus causing the dust separation. The dust particles drop by gravity to the bottom of the filter bag where they are trapped.

When it is desired to remove the filter bag 43 for emptying the accumulation of dust and dirt, or for the substitution of a new one therefor, the clamps 32 are released and the outer end cap 30 removed, whereupon the operator reaches within the cylindrical casing 16 and compresses the upper closed end of the bag about the tube 39, grasping the tube adjacent the milled portion 50. This gives the operator a firm grip to enable the tube 39 to be released from the catches 22 and slid outwardly of the inner tube 19. When fully removed, as shown in Figure 4 of the drawings, the extending end of the pipe 39 is grasped and pulled free of the tubular portion 45. It is possible to use filtering bags which are entirely disposable after one use, or if desired a cloth or paper bag such as shown in Figure 4 wherein the upper end is openable but is normally closed by a suitable sealing means 58 which may be opened in order to enable the emptying of the accumulated dust or dirt from within the bag 43.

In Figure 9 of the drawings I have illustrated a deodorizer 59 associated with the cap 30, and which includes a holder member 60 having a threaded stem 61 for threading engagement with a threaded ferrule or sleeve 62 carried by the reduced end of the hand grip 24. The holder member 60 is supported in spaced relation with respect to the cap 30 and removably receives a deodorizing element 63 which may be in the form of disinfecting crystals, said holder member having

openings or screen walls 63 therein in order to permit the exhaust air to pass through the crystals and out through the exhaust openings 38 in the cap 30. It will thus be seen that the air exhausted from the cylindrical casing 16 is subjected to a deodorant which will serve to purify or perfume the air of a room during use of the device in the cleaning thereof.

In Figures 10 and 11 of the drawings, I have illustrated a slightly modified form of air exhaust and deodorizer. In this form the hand grip 24' supports an end cap 30' provided with a vertical side wall or depending flange 64 which is provided with a series of air exhaust openings 38'. These openings extend for only one half the circumference of the side wall and are positioned so as to be at the side of the device opposite to the position of the operator when operating the same. The hand grip 24' also supports an inner cap member 65 provided with air exhaust openings 66 which serves to maintain the deodorizing element 59' in position upon the upper end of the cylindrical casing 16. In this form the deodorizing element is seated directly over the upper end of the casing 16 which necessitates all of the exhaust air passing therethrough from whence said air passes to the atmosphere through the openings 66 and 38'. By arranging the openings 38' in the manner shown and described, the air is exhausted in a direction away from the operator.

In Figure 12 of the drawings a further modification is shown wherein the cylindrical casing 16' is formed with an outstanding nipple 67 in its side wall adjacent the open top end thereof. A bayonet slot 68 is formed in the nipple, while the collar 69 is engageable with the nipple by reason of a pin 70 engaging in the bayonet slot 68. The collar 69 constitutes a holder for the deodorizing element 70'. In this form, a closed cap 71 fits upon the upper end of the cylindrical casing 16' which necessitates the exhausting of all air through the deodorizer 70' mounted in the side of the cylindrical casing 16'. When cleaning and not deodorizing a room the deodorizer may be removed from the attaching nipple.

From the foregoing description, it will be seen that I have provided a vacuum cleaning device in which a cylindrical casing acts as a holder for a filtering bag, the said casing acting as a handle during the use of the device and which dispenses with the general practice of mounting the dust collecting bag upon and exteriorly of the handle. By reason of the construction shown, a high efficiency is obtained in the filtering of the air exhausted from the device as the bag provides a large filtering area which in no way will interfere with the free flow of air from the floor tool to the exhaust of the same to the atmosphere. Also, it is possible to perfume or disinfect the atmosphere of a room during a cleaning operation.

While I have shown and described what I deem to be the most desirable embodiment of my invention, I wish it to be understood that various changes as come within the scope of the appended claims may be resorted to if desired.

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

1. In a vacuum cleaner, a cylindrical casing having an air exhaust at one end thereof, an exhaust air tube opening through one end of said casing and having communication with the interior thereof, and an air filtering and dust collecting bag contained within said casing and open at one end and provided with a central tubular portion in spaced relation to the side walls of the bag and providing an open passage throughout its length and terminating adjacent the closed end thereof and into which said exhaust air tube extends.

2. In a vacuum cleaner, a cylindrical casing, a removable cap closing one end of said casing, a handle member extending from said cap, said casing having an air outlet, an air exhaust tube opening through the other end of said cylinder and extending thereinto, an air filtering and dust collecting bag provided with a central tubular portion rising inwardly of the body in spaced relation to the walls thereof, a removable tubular member telescoping said exhaust tube, and the tubular portion of said bag, and means for releasably securing said tubular member upon said air exhaust tube.

3. In a vacuum cleaner, a cylindrical casing, a removable cap closing one end of said casing, a handle member extending from said cap, said casing having an air outlet, an air exhaust tube opening through the other end of said cylinder and extending thereinto, an air filtering and dust collecting bag provided with a tubular portion rising inwardly of the body in spaced relation to the side walls thereof, a removable tubular member telescoping said exhaust tube, and the tubular portion of said bag, friction contact surfaces provided on the exterior of said tubular member adjacent the opposite ends thereof, and means for releasably securing said tubular member upon said air exhaust tube.

4. In a vacuum cleaner, a casing through which air is passed, an air tube extending into said casing and having communication with the interior thereof, a flexible dust collector bag and filter having an open restricted neck, a flexible tube extending within said bag from said neck in spaced relation to the side walls of said bag, and a rigid tube telescoping said flexible tube and in turn telescoping said air tube.

5. In a vacuum cleaner, a casing having an outlet at one end thereof, a rigid air inlet tube extending inwardly of said casing from the opposite end thereof and terminating short of the outlet end, a flexible air filtering and dust collecting bag within said casing having a reduced open neck, a flexible tubular portion extending centrally within the body of said bag in spaced relation to the walls thereof, a rigid bag holder tube passing through said flexible tubular portion and insertable therein before the placing of said bag into said casing, said holder tube fitting onto said air inlet tube, and releasable interlocking means between said holder tube and said air inlet tube for holding the former against accidental longitudinal movement relative to the latter.

6. In a vacuum cleaner having an air exhaust tube, a flexible air filtering and dust collecting bag open at its bottom and provided with a central tubular portion rising inwardly of the body of the bag from the open bottom and in spaced relation to the sides and the top wall thereof, and a rigid bag holder tube telescoping the central tubular portion of said bag and itself telescoping said air exhaust tube.

HARRY KESSLER.