Aug. 4, 1942. D. G. SMELLIE 2,291,770

SUCTION CLEANER

Filed July 5, 1940 2 Sheets-Sheet 1

Fig. 1

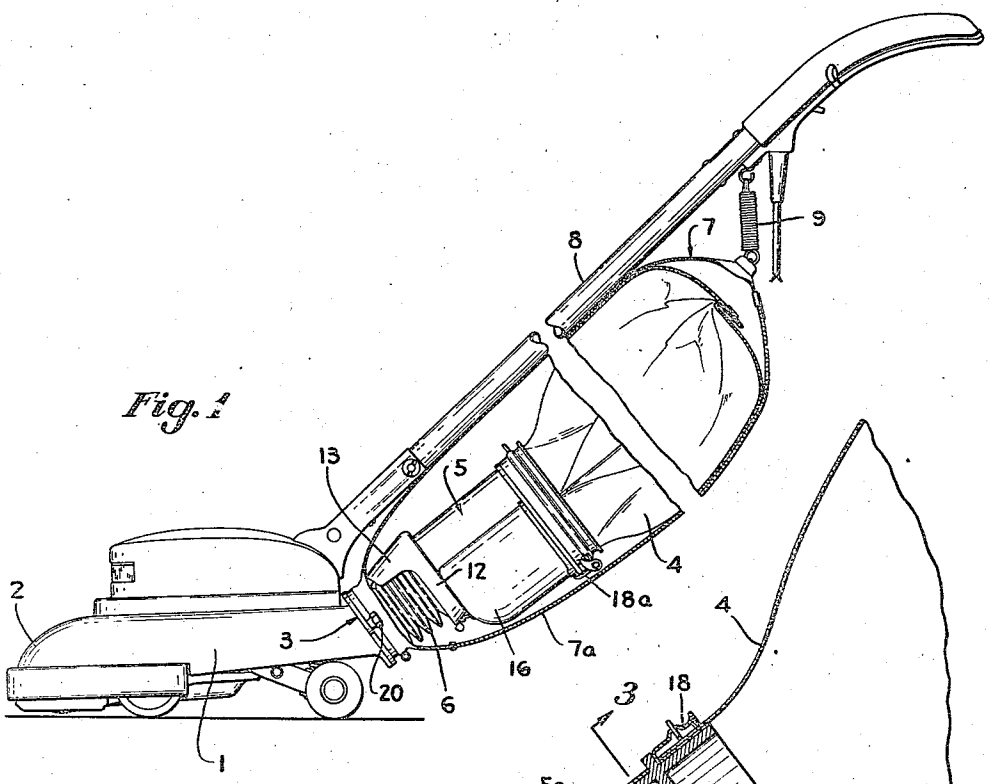
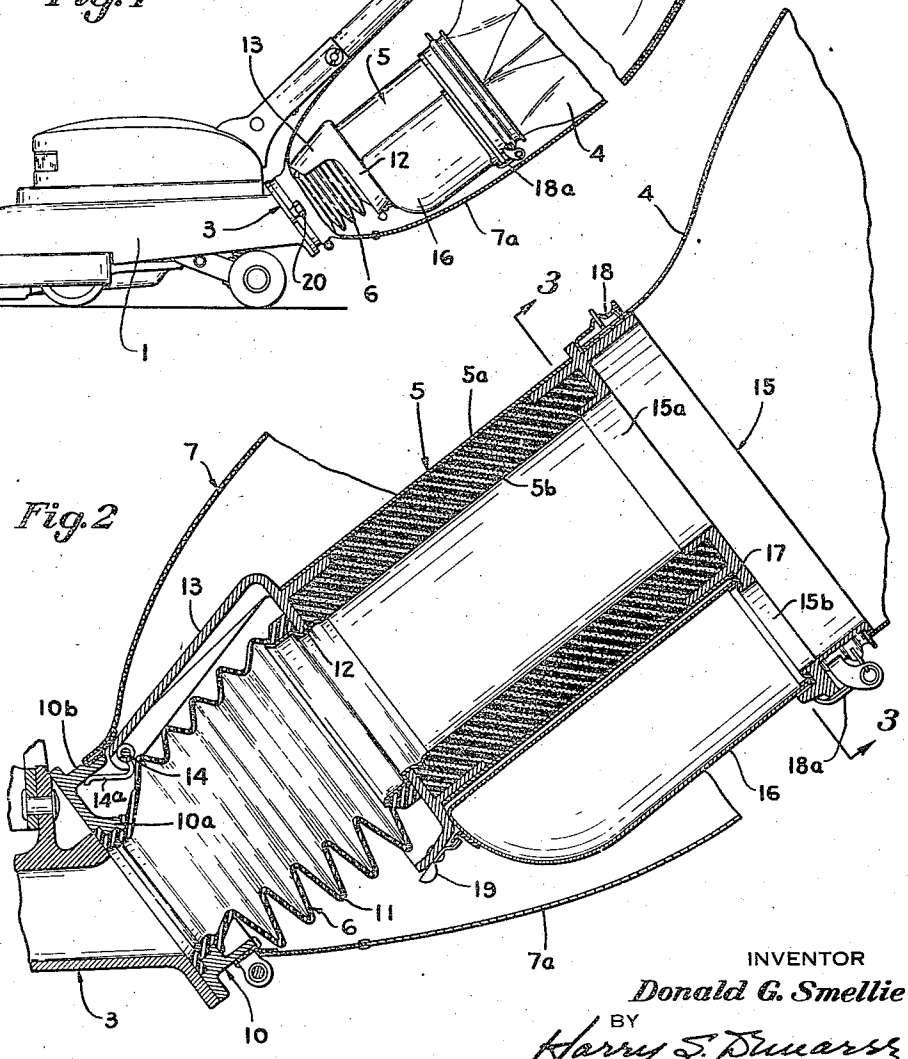


Fig. 2



INVENTOR

Donald G. Smellie

BY

Harry S. Duncan

ATTORNEY

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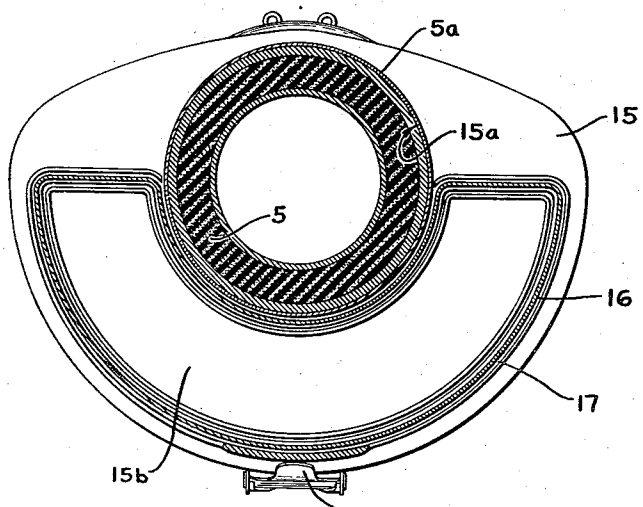


Fig. 3

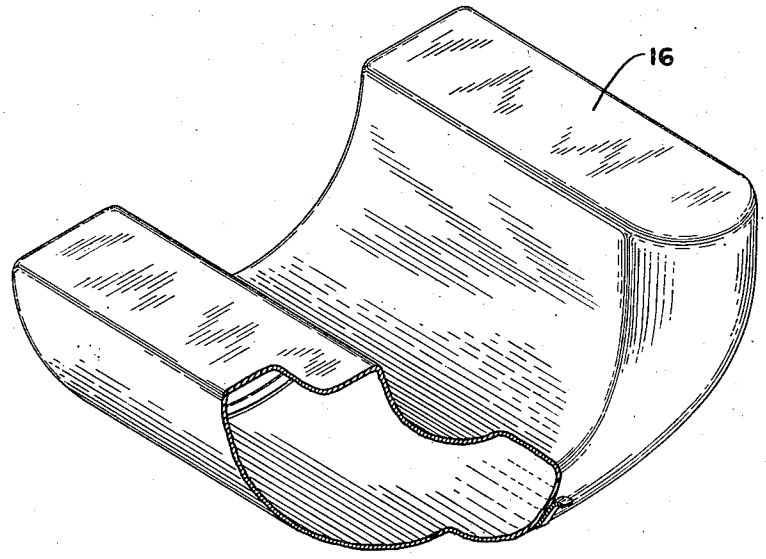


Fig. 4

INVENTOR
Donald G. Smellie
BY
Harry S. Duncan
ATTORNEY

Patented Aug. 4, 1942

2,291,770

UNITED STATES PATENT OFFICE

2,291,770

SUCTION CLEANER

Donald G. Smellie, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application July 5, 1940, Serial No. 343,997

5 Claims. (Cl. 183—51)

This invention relates to improvements in suction cleaners and more particularly to an improved arrangement for disposing of the dirt discharged into the filter or dirt bag and including a muffler between the exhaust outlet and the filter bag and a removable dirt-collecting receptacle communicating with the lower end of the filter bag.

In order to define the scope of the present improvement, it may be stated that the general arrangement of the muffler and filter bag mounting has been disclosed in an earlier application, filed on July 3, 1939 and bearing Serial No. 282,617, and therefore the object of the present invention is to improve upon the earlier arrangement by including a removable dirt-collecting receptacle communicating with the lower end of the filter bag and into which the heavier particles of dirt will find their way by gravity, thence to be readily disposed of from time to time by the removal and emptying of the receptacle without the accompanying removal of the filter bag, or at least, not with the same frequency. However, it is contemplated that the filter bag will in time become filled with the lighter and fluffier litter removed from the carpet surface and therefore be disposed of by the detachment and emptying of the filter bag or, in case the bag be made of paper, disposal of the bag and its contents and replacement by a new bag.

With the foregoing introduction to the subject matter of the present disclosure, a preferred arrangement therefor has been illustrated in the accompanying drawings, in which:

Figure 1 is a general view in side elevation of a typical suction cleaner with a portion of the outer envelope, normally concealing the muffler and filter bag assembly, removed;

Figure 2 is an enlarged detail view of the muffler and filter bag assembly with portions thereof shown in section;

Figure 3 is a view in cross section taken through the muffler and dirt collecting receptacle, on line 3—3 of Figure 2; and

Figure 4 is a perspective view of the dirt receptacle.

In its general design and arrangement the suction cleaner herein disclosed is typical of any standard make, consisting of the usual wheeled body or casing 1 having a suction nozzle 2 extending across its forward end with its mouth in close proximity to the carpet surface, and a motor-driven suction fan housed within a fan chamber communicating with the nozzle and having an exhaust outlet connection 3 at its rear end to which a filter bag 4 is attached. In this instance, however, a muffler 5 with a hinged mounting 6 is introduced between the exhaust outlet from the cleaner and the filter bag. Moreover, in the present disclosure an outer cover or envelope 7, having the appearance of a secondary filter bag, provides an enclosure for the muffler and filter bag assembly, but as will presently be pointed out, this outer envelope is essentially for appearance purposes and therefore can be eliminated if desired.

A handle 8 completes the cleaner assembly, the same having pivotal connection near the rear end of the casing 1, and extends in a general upward and rearward direction. And finally, the handle 8 supports the filter bag 4 and envelope 7 by means of an extensible connecting member 9 depending from a point near the upper portion of the handle and detachably secured to the outer end of the filter bag envelope.

Now, referring in greater detail to the muffler and filter bag mounting, the exhaust outlet connection 3 from the fan chamber is preferably extended a short distance beyond the rear end of the casing proper and terminates in a flat seat tilted upwardly so that it lies in a plane slightly oblique to the vertical at an angle of approximately 30 degrees and carries the inner end of the envelope 7 and the flexible muffler connection 6.

Thus, seating on the face of the outlet connection 3 is a bag and muffler supporting fitting 10 having the form of a ring or collar with a flanged opening 10*a* surrounding the exhaust outlet passage from the fan chamber. Clamped in the opening in the fitting 10 is one end of a flexible bellows member 11 consisting of a short tube of flexible material such as sheet rubber contracted longitudinally into a series of corrugations. The outer end of the bellows member is suitably fastened to a rigid collar 12 supported on the fitting 10 independently of the bellows member by means of an arm 13 having hinged mounting at 14 immediately above the base of the bellows member and on a flange 10*b* extending around the edge of the collar 10. A counterbalancing spring 14*a* at all times exerts a lifting force upon the arm 13 which tends to counterbalance the combined downward pivoting forces acting thereon.

This hinged and flexibly mounted collar 12 also supports the base of the muffler 5, consisting preferably of a light metal tubular shell 5*a* lined with a relatively thick layer of sound-absorbing material 5*b*, such as sponge rubber.

The overall length of the muffler is relatively short compared to the length of the bag, being approximately 8 inches in length and 3 inches in diameter.

The filter bag 4 communicating with the outer end of the muffler may be of any suitable filtering material, although one made of a special grade of paper is preferably used. In the ordinary application of a filter bag to the outer end of a tubular muffler, the inlet end of the bag would be gathered to fit over the end of the muffler and a suitable clamp provided. However, in the present arrangement a special collar-like fitting 15 is used for attaching the filter bag to the muffler and at the same time providing a discharge opening from the lower end of the filter bag into a dirt receptacle 16 having the form of a semi-circular cannister lying beneath and surrounding the under half of the tubular muffler.

But referring first to the bag and receptacle supporting fitting 15, the same consists generally of a ring somewhat elliptical in shape (see Figure 3) and having a centrally and symmetrically located circular opening 15a flanged to receive the outer end portion of the muffler and suitably secured thereto. And immediately surrounding the lower half of the circular opening 15a but separated therefrom is a larger semi-circular opening 15b of crescent shape forming the port leading into the removable dirt-collecting receptacle, which is preferably drawn or stamped of a light metal to a cross section conforming to that of the port 15b and entirely open at one end.

The port 15b is marked around its under side by a groove in which is inserted a rubber gasket 17 forming an airtight seat for the open end of the dirt-collecting receptacle. Thus, the outer end of the muffler is offset somewhat above the port 15b leading into the dirt-collecting receptacle 16 so that the dirt particles discharged into the filter bag will gradually work downwardly along the lower side of said bag and eventually find their way into the dirt receptacle.

The opening at the lower end of the dirt bag 4 is relatively larger than usual having a diameter sufficient to include the collar 15. In fact, the lower edges of the bag fit over the collar and edgewise into an annular slot formed between the outer edge of the fitting 15 and a clamping collar 18 capable of contraction by the manipulation of a lever 18a to secure the bag firmly in place.

Similarly, the dirt-collecting receptacle 16 is provided with suitable attaching means to hold it into position beneath the muffler, namely, a pivoted latch member 19 mounted on the underside of the hinged collar 12 of the bellows mounting 6 and so located as to be readily accessible for the removal of the dirt receptacle for emptying purposes.

And in this connection, it may be noted that the outer envelope 7 provides a complete enclosure for the muffler and filter bag assembly in that its lower end is clamped around the flanged marginal portion of the muffler supporting fitting 10 and further, that the complete assembly is removable from the cleaner as a unit by loosening the attaching bolts 20, 20 on either side of the exhaust outlet connection. And finally, the outer envelope 7 has a zipper-fastened opening 7a extending lengthwise along its underside, so that the muffler, bag and dirt-collecting receptacle are readily accessible for emptying or replacement.

Bearing in mind that the emptying of the filter bag is usually an arduous task for the operator, any arrangement which reduces the frequency of these emptying operations is a meritorious improvement. But to remove and empty an open rigid receptacle filled mostly with more or less solid dirt is not so distasteful because the dirt is in a compact form and can be emptied without shaking or otherwise causing dust to rise. At the same time, the lighter and fluffier types of litter which are not capable of finding their way by gravity into the removable receptacle remain in the filter bag and eventually have to be disposed of. But with the heavier dirt particles in the form of sand, grit, and the like being collected by gravity in the receptacle and emptied at frequent intervals greatly facilitates the problem of dirt disposal aside from relieving the bag of the strain resulting from the heavier dirt accumulating in the lower end of the filter bag, a condition that might readily cause the bag to weaken, particularly if made of paper or other material not having the requisite tensile strength to carry the heavy dirt. Nor is the advantageous use of the dirt receptacle offset by the fact that it occupies space and additional equipment is required for its mounting, since it is quite possible to fashion the receptacle and its fittings of a very light metal so that the actual increase in weight would be quite negligible.

Having set forth a preferred embodiment of the invention, I claim:

1. A suction cleaner bag and muffler unit comprising an attaching ring adapted to be secured to the exhaust outlet of a suction cleaner, a cylindrical air-conducting muffler pivotally connected to said ring by means including a flexible bellows, a filter-bag-seating collar carried at the outer end of said muffler and including an aperture adjacent the end of said muffler, a dirt receptacle detachably positioned adjacent said muffler, movable therewith and connected to the said aperture in said collar, and a dirt-filtering bag detachably seated on said collar enclosing the open end of said muffler and said aperture and movable with said muffler about its pivotal mounting.

2. A suction cleaner bag and muffler unit comprising a hollow muffler body, a dirt receptacle detachably carried by said body and having an opening adjacent an open end of said muffler, an attachment fitting adapted to be secured to the exhaust outlet of a suction cleaner, means pivotally mounting and interiorly connecting said muffler to said fitting, bag-attaching means at the adjacent open ends of said muffler and said receptacle, and a filter bag secured to said bag-attaching means and open to said muffler and said receptacle.

3. A suction cleaner bag and muffler unit comprising a hollow muffler body, a dirt receptacle detachably carried by said body and having an opening adjacent an open end of said muffler, an attachment fitting adapted to be secured to the exhaust outlet of a suction cleaner, means pivotally mounting and interiorly connecting said muffler to said fitting, bag-attaching means at the adjacent open ends of said muffler and said receptacle, a filter bag secured to said bag-attaching means and open to said muffler and said receptacle, and an appearance bag seated on said attachment fitting enclosing said muffler and said filter bag and provided with zipper

closure means along its side to permit the removal of said receptacle or said filter bag from said muffler.

4. A suction cleaner bag and muffler unit comprising an attachment fitting adapted to seat upon the exhaust outlet of a suction cleaner, a muffler pivotally connected on said fitting by means including a flexible conduit, a dirt receptacle carried by said muffler, spring means to counterbalance the weight of said muffler and receptacle, and a filter bag removably connected to said muffler and said receptacle.

5. A suction cleaner bag and muffler unit comprising an apertured attachment fitting adapted to seat upon the exhaust outlet of a suction cleaner, a muffler pivotally mounted upon said fitting, a flexible bellows interiorly connecting said muffler and the aperture in said fitting, a bag-seating member at the outer end of said muffler, bag-clamping means carried by said member manually operable on the underside thereof, a receptacle removably secured adjacent said muffler and exteriorly open through said bag-seating member, a filter bag seated on said bag-seating member, and an appearance bag seated on said attachment fitting enclosing said muffler, receptacle and filter bag and formed with a zippered opening along its underside to provide admission to said receptacle and said bag-clamping means.

DONALD G. SMELLIE.