May 6, 1958 R. I. LAPPIN ET AL 2,833,372

VACUUM CLEANER EQUIPPED WITH DISPOSABLE BAG

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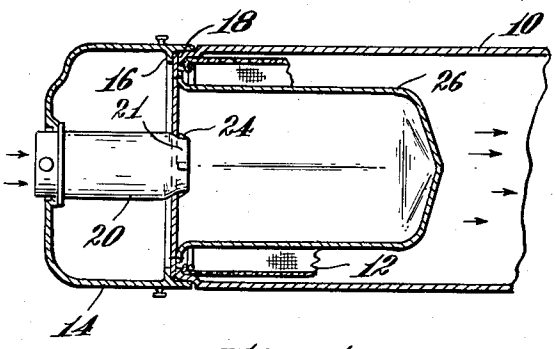


Fig. 1

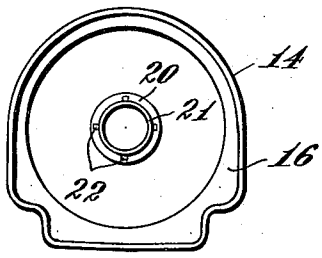


Fig. 2

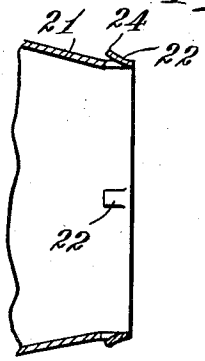


Fig. 3

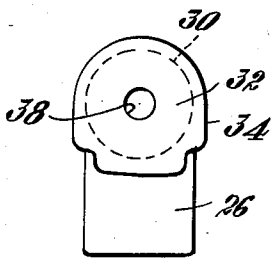


Fig. 4

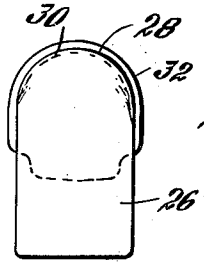


Fig. 5

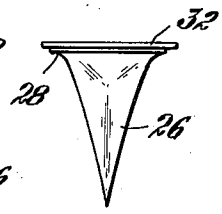


Fig. 6

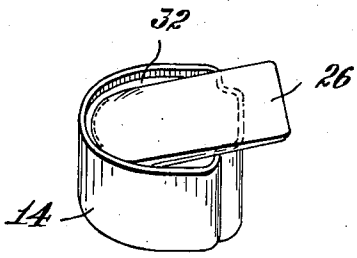


Fig. 7

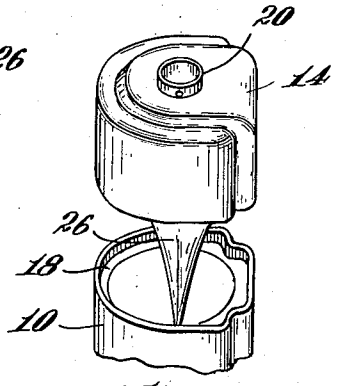


Fig. 8

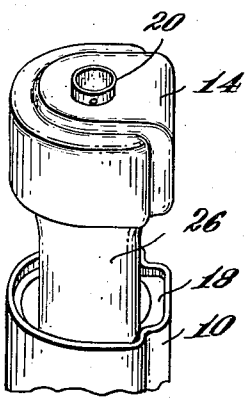


Fig. 9

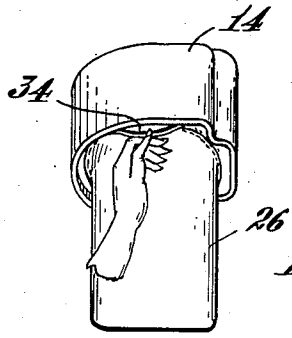


Fig. 10

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VACUUM CLEANER EQUIPPED WITH DISPOSABLE BAG

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5 Claims. (Cl. 183—43)

This invention relates to vacuum cleaning equipment and more especially to a novel combination of disposable bag and cleaner of the horizontal tank type.

The principal objects of the invention are to provide a vacuum structure and disposable bag in which the disposable bag may be inserted in and removed from the tank solely by assembling and disassembling the end bell and tank. Another object of the invention is to provide a structure in which the bell and disposable bag may be removed from the tank without touching the bag and without danger of the bag being disengaged from the bell so as to spill its contents. Another object is to provide a structure in which the bag can easily be grasped to disengage it from the bell when desired without touching the dirt within it and without spilling the dirt. Other objects are to provide a disposable bag for use with the cleaner which is extremely simple to make, requires no special sealing arrangement at its mouth, is durable and inexpensive.

As herein illustrated the bell of the tank has an intake conduit to which the suction hose is adapted to be attached and a portion of the conduit extends inwardly beyond the plane of the mouth of the usual permanent bag mounted within the tank so that its inner end actually projects into the mouth of the bag. The inner end of the conduit has on it a plurality of externally protruding shoulders and a disposable bag of suitable dimensions with a stiff end board attached to its mouth and with a central opening in it snapped over the end of the conduit behind the lugs, thus attaching the bag to the bell so that by assembling the bell or removing it the bag may be introduced into the tank for use or removed for disposal. The conduit is slightly tapered near its end to facilitate guiding it into the opening in the end board and the lugs protrude from the tapered portion. Preferably the lugs are struck out of the metal so as to constitute hooks for supporting the bag when the bell is removed from the tank until the bag can be detached. The end board is dimensioned to have a marginal edge which will extend between cooperating flanges at the ends of the bell and tank to clamp it in place and the body of the bag is stitched to the end board inwardly of its margin so as to be free from the clamping flanges.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a longitudinal vertical section at one end of a tank cleaner showing the disposable bag assembled in place for use;

Fig. 2 is an end view of the bell as seen from the inner side thereof;

Fig. 3 is an enlarged fragmentary diametrical section of the intake conduit at its inner end;

Fig. 4 is a front view of the disposable bag with the end board folded against it;

Fig. 5 is a back view of the disposable bag with the end board folded against it, showing the means for attaching the bag to the board;

Fig. 6 is a side view of the disposable bag unfolded;

Fig. 7 is an isometric view of the bag assembled in the bell;

Fig. 8 is an isometric view of the bell with the bag fastened thereto ready to be placed in the tank;

Fig. 9 is an isometric view of the bell being removed with a filled bag; and

Fig. 10 is an isometric view of the preliminary steps in disengaging the filled bag from the bell.

Referring to Fig. 1 there is shown a portion of a tank-type vacuum cleaner with a tank body **10**, within which there is secured a permanent porous bag **12** and a bell or cover **14** adapted to be attached to the mouth of the tank. The tank and bell are each provided with an inwardly directed flange **16** and **18** adapted to be brought into engagement when the bell and tank are assembled to hold the parts in predetermined relation to each other and suitable locking means is employed to hold the parts together. The bell has through it a conduit **20**, the inner end of which extends inwardly beyond the flanges **16** and **18** into the mouth of the bag **12**, and has near its inner end a tapered portion **21** which carries a plurality of lugs **22** (Fig. 3). The lugs **22** are struck out of the metal of the tapered portion of the conduit so as to stand outwardly therefrom (Fig. 3) to provide shoulders or hooks **24**, behind which the end board of a disposable bag may be snapped as will now appear.

The disposable bag (Figs. 4, 5 and 6) consists of an inexpensive porous paper body **26**, the mouth **28** of which is folded outwardly and attached by stitching **30** or other suitable means to a stiff end board **32** made of paperboard. The outer surface of the end board is preferably suitably finished to receive printed matter for both instructions as to use and advertising matter. The end board **32** is dimensioned and shaped to fit into the open end of the bell **14** and to have its marginal portion **34** overlapping the flange **16** and preferably to fit reasonably close to the wall of the bell adjacent the flange. A central opening **38** (Fig. 4) is formed in the end board so as to be in registration with the intake conduit **20**, when the end board is seated in the mouth of the bell and corresponds substantially in diameter to the tapered portion of the intake conduit behind the lugs, so that when it is forced over the tapered end of the conduit it will be held substantially fixed between the shoulder at the large end of the taper and the lugs. The tapered portion of the conduit assists in centering the board with respect to the conduit and guiding it over the lugs for snapping it into place behind them. The radial protrusion of the lugs **22** beyond the surface of the tapered portion is sufficient so that once the end board is snapped over the lugs it will not become disengaged without purposely manipulating the end board by bending it.

The disposable bags are supplied in lots of a dozen or any suitable amount to a customer in a folded condition, such as shown in Figs. 4 and 5, and are used as follows:

First the end bell is removed from the tank as shown in Fig. 7 and one of the bags in its folded condition is placed within the open end of the bell and the stiff end board **32** is forced over the inner end of the conduit **20** so as to engage the marginal edges of the opening **38** behind the lugs **22**. The bell is now picked up and the bag pulled downwardly to a substantially vertical position as shown in Fig. 8 and is then inserted into the permanent bag within the tank by placing the bell over the end of the tank and fastening the same in the usual manner. As seen in Fig. 1, when this is done, the marginal edge **34** of the end board is clamped between the flanges **16** and **18**. When the cleaner is turned on for use the vacuum established within it pulls the bag open so as to be concentric with the walls of the permanent bag. After use the bag is removed by detaching the bell and removing it from the tank as shown in Fig. 9.

Regardless of the quantity of dirt collected in the bag during use, the bag will not fall off the conduit as the bell is removed due to the stiffness of the end board and the hook-like shoulders 24 which firmly support it in place, thus there is no danger of the bag falling off and of the contents spilling. The bag may be transported to a place for disposal by using the bell to support it so that the bag itself need not be touched. When ready for disposal the bag may easily be detached by pulling downwardly on the marginal edge (Fig. 10) so as to bend the board away from the conduit. A decisive tug will disengage the board from the lugs. Since the board seals the mouth of the bag even when detached, except for the small central opening, there is little danger of spilling the contents before it can be dropped into a disposal can.

As previously mentioned the exposed surface of the end board is preferably finished to permit printing instructions on its face for use of the bag and for receiving advertising information as to its source and availability.

The simplicity and cheapness, characteristic of this disposable bag, are derived principally from the fact that no complicated constrictive seal is required at the mouth of the bag either to maintain a suitable vacuum seal between it and the intake conduit or to hold it on the conduit for disposal. Other advantages are attained by use of a conventional and very simple bag body comprised of a pervious paper which is stitched at its mouth directly to the end board which itself may be produced by the simplest punching operation.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

We claim:

1. The combination with a suction cleaner having a tank provided with an open mouth within which is disposed a pervious bag having a mouth coinciding with the mouth of the tank, and a bell detachably attached to the tank so as to cover the mouth; of an intake conduit to which the suction hose may be attached, said conduit having a portion extending internally into the mouth of the tank, and having a plurality of externally located lugs on its inner extremity projecting radially outward of the external surface thereof, and a disposable open mouth bag, said disposable bag having a stiff end board attached to its mouth with a centrally located hole corresponding substantially in diameter to the external diameter of the conduit adjacent the lugs, the substance of the board bounding the hole being adapted yieldably to receive the end of the conduit and to snap over the lugs.

2. A combination according to claim 1, wherein the inner end of the conduit is tapered and the lugs are struck out of the tapered portion.

3. A combination according to claim 1 wherein the inner end of the conduit is tapered and the lugs project from the tapered portion and form with the tapered portion means preventing axial movement of the end board once it is snapped behind the lugs:

4. A combination according to claim 1, wherein the lugs have outwardly facing inclined surfaces converging toward the inner end of the conduit and shoulders behind their outer ends.

5. A combination according to claim 1, wherein the lugs are struck outwardly from the metal of the conduit to provide tanks standing away from the wall with their free ends constituting hangers for supporting the marginal material of the end board of the disposable bag.

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