United States Patent

Malz

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[54] **VACUUM CLEANER**

[72] Inventor: **Ute K. Malz**, St. Paul, Minn.

[73] Assignee: **Whirlpool Corporation**

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[52] **U.S. Cl.**.....**55/376**, 55/378, 55/DIG. 3

[51] **Int. Cl.**.....**B01d 46/02**

[58] **Field of Search**.....55/361–381, 507, 55/509; 15/327 R, 327 A–327 E

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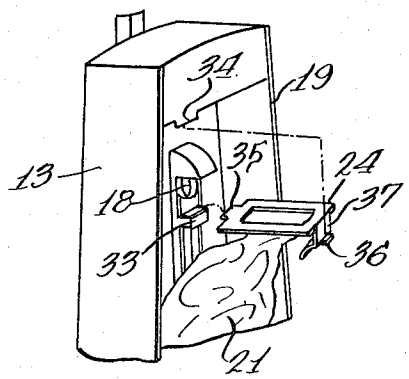
Primary Examiner—Frank W. Lutter
Assistant Examiner—Vincent H. Gifford
Attorney—Hofgren, Wegner, Allen, Stellman & McCord, James S. Nettleton, Thomas E. Turcotte, Burton H. Baker, Gene A. Heth, Franklin C. Harter, Anthony Niewyk and Robert L. Judd

[57] **ABSTRACT**

A vacuum cleaner for separating dirt from a dirt laden air stream during a cleaning operation having an improved adapter plate releasably supporting a filter such as a disposable porous paper bag with the adapter plate having a pair of spaced catch members engaging catch retainers on the cleaner to retain the plate and thus the bag in position for filtering dirt laden air and with one of the catch members being on a resilient portion of the adapter so that the adapter and the attached bag may be inserted and removed by distortion of this resilient portion.

4 Claims, 6 Drawing Figures



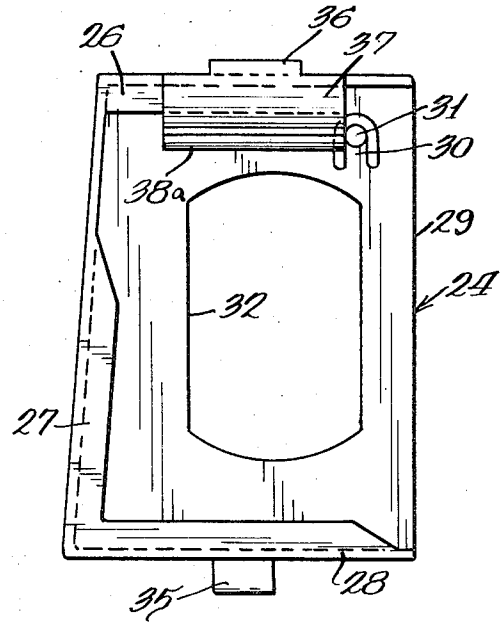


Fig. 1.

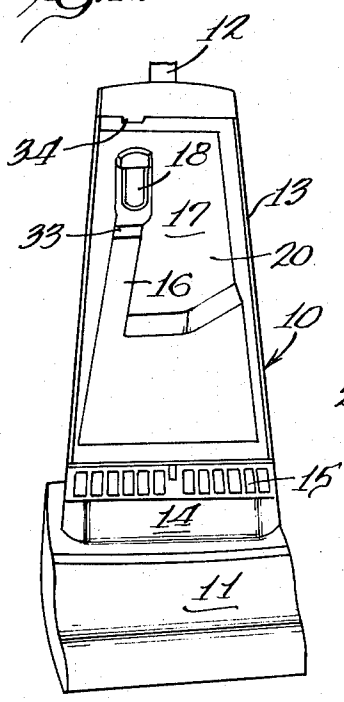


Fig. 3.

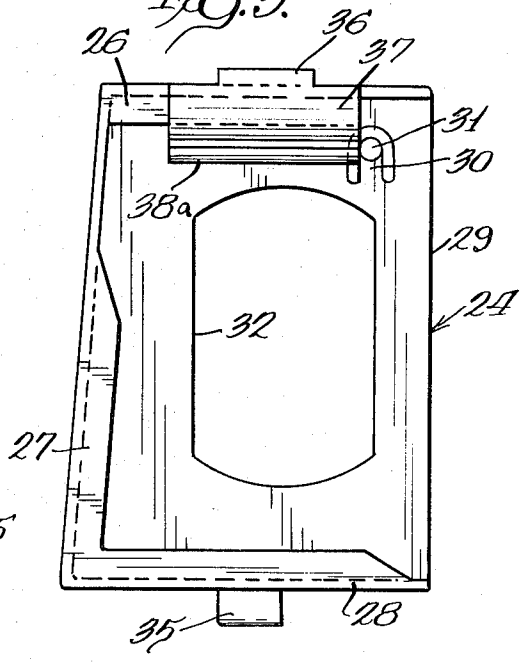


Fig. 4.

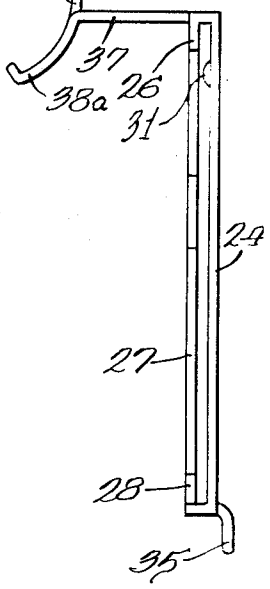


Fig. 2.

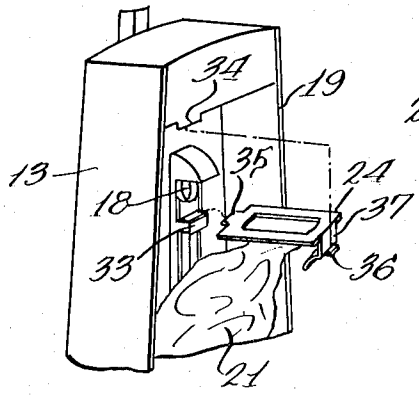


Fig. 5.

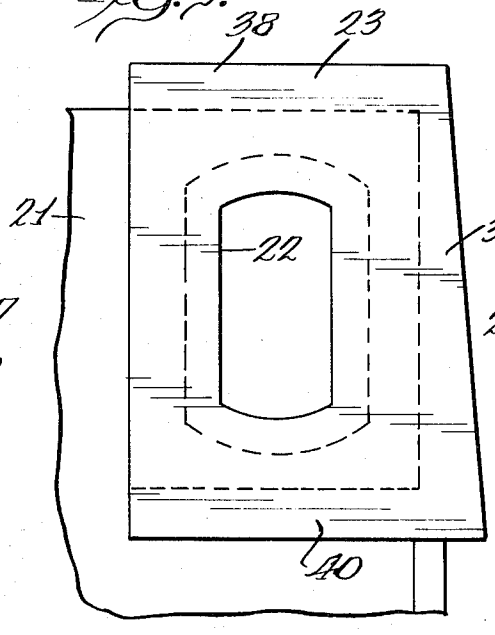
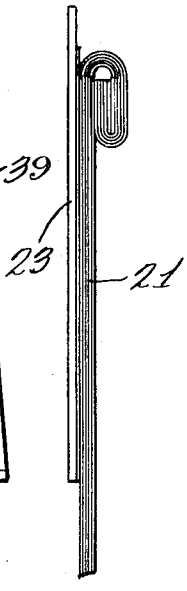


Fig. 6.



Inventor:
Ute K. Malz
By Hofgren, Wegner,
Allen, Stellman & McCord
Attys

VACUUM CLEANER

One of the features of this invention is to provide a vacuum cleaner particularly of the type in which the dirt separating member is retained in a housing and including an adapter with a resilient catch for releasable mounting in the housing with the bag being supported by the adapter.

Other features and advantages of the invention will be apparent from the following description of one embodiment thereof as shown in the accompanying drawings. Of the drawings:

FIG. 1 is a front perspective view of a vacuum cleaner embodying the invention and with the front cover plate of the bag confining housing omitted to expose the interior of the housing.

FIG. 2 is a fragmentary perspective view of the top of the cleaner housing of FIG. 1 illustrating the installation or removal of a filter bag therefrom.

FIG. 3 is an enlarged front elevational view of an adapter plate on which a filter bag may be suspended.

FIG. 4 is a side elevational view of the adapter plate.

FIG. 5 is a fragmentary elevational view of a disposable paper filter bag usable in the vacuum cleaner of this invention.

FIG. 6 is a fragmentary edge elevational view of the portion of the bag shown in FIG. 5.

The vacuum cleaner 10 illustrated in the accompanying drawings comprises a nozzle structure 11 adapted to be propelled over a floor during the cleaning operation, a handle 12 for so propelling, a rigid upright housing 13 to which the handle 12 is attached so that the combination of the handle and housing provide the means for propelling the nozzle structure and a horizontal cylindrical casing 14 to which the rigid housing 13 is attached and with which it is rotatable about the horizontal axis of the casing. The casing 14 contains the motor-fan suction unit which draws dirt laden air in through the nozzle structure 11 in the customary manner and exhausts the filtered air through a front exhaust grill 15.

Air flowing from the unit within the casing 14 flows upwardly through a conduit 16 that is positioned adjacent the rear wall 17 of the housing 13 and exhausts at the conduit exit end 18 forwardly toward the front 19 of the housing 13 which is normally closed by a removable cover plate that is omitted from the drawings. The rear wall 17 of the housing 13 is recessed as shown at 20.

The filter member for separating dirt flowing from the exit end 18 is customarily a disposable porous paper bag 21. Such a bag usable in this invention is illustrated in FIGS. 5 and 6. As can be noted in FIG. 5 the bag 21 has a generally rectangular access opening 22 that is positioned in a generally rectangular stiff collar 23 that is conveniently made of cardboard or similar material.

The filter bag 21 is mounted on an adapter means 24 which as shown is embodied in a flat plate which may be made of a resiliently deformable plastic material. This adapter plate is provided with edge channels 26, 27 and 28 integral with the plate and opening away from the corresponding edges. As indicated, there are three such channels with the one edge 29 which is a long edge of the rectangle being unprovided with such a channel.

In order to aid in retaining the collar 23 on the adapter plate 24 the plate has formed therein a tongue 30 with a raised surface end 31 so as to increase the frictional resistance to insertion and removal of the collar 23 within the channels 26–28. The plate 24 is provided with a generally rectangular opening 32 similar to but larger than the collar opening 22.

In order to releasably retain the adapter plate 24 and the bag 21 attached thereto there are provided a pair of catch retainers one of which 33 is below the conduit exit end 18 and the other of which 34 is above it. The conduit exit end 18 and the one catch retainer 33 which is below this exit end are located adjacent the rear side wall 17 of the housing 13. This rear wall 17 is of course that side of the casing that is opposite the front opening 19 of the housing. The other or upper catch retainer 34 as is shown most clearly in FIG. 2 is located forwardly of the rear wall 17 and adjacent the open front 19 of the housing.

In order to releasably retain the adapter plate 24 and the attached bag 21 in position so that the bag receives dirt laden air from the conduit exit 18 the adapter plate 24 is provided with a pair of catch members 35 and 36. One catch member 35 is in the form of a projecting tongue extending downwardly from the adapter plate 24 while the other catch member 36 extends upwardly from a forwardly projecting resilient portion 37 at the upper end of the adapter plate 24. As is shown in FIG. 4 the resilient portion 37 on the forward end of which the catch member 36 is positioned extends forwardly so as to engage the corresponding catch retainer 34.

The portion 37 beyond the catch member 36 is shaped to provide a handle 38*a* by means of which the portion 37 is flexed in mounting the adapter plate 24 and the attached bag in the cleaner housing and in removing it therefrom.

In operation the corresponding edges 38, 39 and 40 of the stiff collar 23 are slipped into position behind the edge channels 26–28 against the frictional resistance of the tongue end 31. The access opening 22 in the filter bag 21 is thereby aligned with the opening 32 in the adapter plate 24. Then, as illustrated in FIG. 2, the plate 24 with the bag 21 is mounted in the housing 13 positioning the catch member tongue 35 within the confines of the retainer 33 and rotating the plate 24 upwardly until the other catch member 36 on the plate can be snapped into position behind the other catch retainer 34. The resiliency of the portion 37 of the plate permits this to be accomplished and ensures secure retaining of the plate and attached filter bag. Then, when it is desired to remove the filter bag and plate it is only necessary to flex the resilient portion 37 downwardly from the position shown in FIG. 4 by pressure applied to the handle 38*a* to disengage the catch 36 from its retainer 34 followed by lifting the other catch from its retainer 33. In other words, the removal operation is just the opposite of the insertion operation.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Vacuum cleaner structure for separating dirt from a dirt laden air stream during a cleaning operation, comprising: confining means for containing a flexible dirt separating filter member, the filer member having an inlet and a surrounding stiff collar and said confining means having a conduit for said air with an exit end opening forwardly through a flat surface within the confining means; a pair of catch retainers in said confining means on opposite sides of said exit end, one catch retainer being disposed adjacent said surface and the other catch retainer being disposed substantially forwardly of said surface; an adapter means for releasably supporting said filter member in a connected position with its inlet aligned with said exit end, said adapter means defining a forward side, a rearward flat side facially confronting said flat surface, and a resilient portion projecting forwardly from said forward side, said adapter means having three edge channels on said forward side defining a U-shaped array for retaining corresponding edges of said collar and resilient means extending forwardly from said forward side of the adapter bearing against said collar to aid in securing the collar on the adapter plate with the edges of the collar slidably received in said channels; and a pair of catch members on said adapter means engaging said catch retainers to retain said adapter means in said position, one of said catch members being positioned on said resilient portion of said adapter means to releasably engage said other catch retainer, said resilient means being yieldable and being provided with a handle disposed forwardly of the catch member thereon for selectively positioning said one catch member when engaging and disengaging said catch members from said catch retainers.

2. The cleaner of claim 1 wherein said adapter means comprises a flat plate having a central opening aligned with said filter member inlet when said collar is fully received in said U-shaped array of edge channels.

3. The cleaner of claim 1 wherein said confining means comprises a housing open at a forward side for access to said conduit exit end, said adapter means comprises a flat plate and said resilient portion extends forwardly therefrom to said open forward side of the housing when said plate is in position connected to said conduit with said catch members engaging said catch retainers.

4. The cleaner of claim 3 wherein said conduit exit end and said one catch retainer are located adjacent the rear side of said housing that is opposite said open forward side, and said other catch retainer is located adjacent said open forward side.

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