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FILTER BAG MOUNTING MEANS FOR SUCTION CLEANER

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This invention relates to suction cleaners and more particularly to a novel means for mounting a filter bag therein.

In suction cleaners of the type utilizing an inexpensive disposable filter bag of air pervious paper or the like it is quite important to provide a simple and effective mounting means enabling housewives and other users to replace a used filter bag in a rapid and troublefree manner. Various means for detachably supporting such filter bags have been proposed heretofore but the present invention affords a unique mounting arrangement which is simple and substantially foolproof in operation. Furthermore, the invention lends itself readily to the manufacture of an inexpensive filter bag incorporating certain portions of the mounting arrangement.

Accordingly, a primary object of the invention is to provide a novel and improved means for detachably mounting a disposable filter bag in a suction cleaner.

A further object of the invention is to provide a novel combination in a suction cleaner of a bag support means and a replaceable filter bag.

Another object of the invention is to provide a novel and improved filter bag for a suction cleaner.

An additional object of the invention is to provide a novel and improved mounting arrangement for a disposable filter bag in a suction cleaner, including a novel mounting collar on the filter bag which is retained in a configuration having increased structural strength and rigidity.

Other objects and advantages of the invention will become evident from the subsequent detailed description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a longitudinal sectional view through a suction cleaner showing one specific embodiment of the bag mounting arrangement of the present invention;

FIG. 2 is an enlarged scale fragmentary elevational view of one portion of the bag mounting means;

FIG. 3 is a fragmentary sectional view taken along the line 3-3 of FIG. 2;

FIG. 4 is a fragmentary top plan view of the interior of the cleaner with a top section of the casing removed;

FIG. 5 is a top plan view of a filter bag embodying the features of the invention, the bag being shown in its flat unmounted condition; and

FIG. 6 is a longitudinal sectional view along the line 6-6 of FIG. 5 with the bag in slightly expanded condition.

Referring first to FIG. 1, a suction cleaner is shown which includes a casing comprising a lower section 11 and a detachable upper section or cover 12. The mating edges of the casing sections 11 and 12 are provided with resilient gaskets or flanges 13 for insuring an airtight seal between the casing sections. A handle or knob 14 is positioned on the upper casing section 12 for operating suitable locking mechanism (not shown) for detachably securing the casing sections together. The lower casing section 11 is mounted on wheels 16 for rolling the cleaner from one position to another, and the lower casing section 11 also has mounted therein a motor-fan unit 17 which discharges air in the usual manner through an outlet 18 in the casing.

The filter bag support comprises a pair of angular

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generally L-shaped rods or arms 19 (FIG. 2) each of which has an upright mounting portion 21 and an outwardly projecting bag-supporting portion 22. At least one, and preferably both, of the arms 19 is pivotally mounted for swinging movement within the casing of the cleaner. In the illustrated embodiment, the arms 19 are pivotally mounted in spaced relation by means of a bracket or plate 22' rigidly secured to an end wall 23 of the lower casing section 11, the plate 22' being formed with a pair of integral outwardly bulged loops or socket portions 24 which rotatably receive the upright mounting portions 21 of the arms 19. The lower end of the mounting portion 21 of each arm 19 projects below its mounting socket 24 and is formed with an annular groove 26 (FIGS. 2 and 3). An elongated bar spring 27 is mounted on the plate 22' between the arms 19 by means of one or more downturned flanges or tabs 28, and the opposite ends of the spring 27 are curved, as at 29, for seating in the grooves 26. Thus, the arms 19 are retained against vertical displacement in the sockets 24 and are also frictionally restrained by the action of the spring so that the arms 19, although not freely rotatable, may readily be swung from side to side as hereinafter described in more detail. The mounting portion 21 and the bag-supporting portion 22 of each arm 19 are interconnected by an angular section 31, and a similar angular downturned section 32 is provided at the outer extremity of the bag-supporting portion 22. Thus, the arm portions 31-22-32 have a generally inverted U-shaped configuration for the purposes described below. The bag-supporting portion 22 of each arm 19 is also provided with an upwardly projecting boss or detent 33, the purpose of which will also be described hereinafter.

Referring now to FIGS. 5 and 6, the filter bag of the present invention is indicated generally at 36 and is of the type which is initially folded flat with a plurality of pleats 37 formed in the side walls thereof in a well known manner so as to permit expansion of the bag during operation of the cleaner. The bag 36 includes a mouth or inlet 38 in one of the flat walls 39 thereof. A rectangular mounting collar 41 of stiff material, such as cardboard or the like, is secured to the filter bag wall 39 around the mouth 38, the collar 41 having an opening 42 overlying the bag mouth 38. As best seen in FIGS. 4 and 5, at least the forward corners of the collar 41 that overlie the main portion of the bag 36 are rounded, as at 41a, to avoid the possibility of puncturing or tearing the bag when the latter is inflated during operation of the cleaner. The collar 41 is preferably secured to the bag wall 39 by means of adhesive which may extend over the entire rectangular area defined between the opposite collar edges designated at 43 and 44 in FIG. 5 and between the uppermost pleated edges of the bag as indicated by the dotted lines 45 and 46 in FIG. 5. Thus, the outer marginal edge portions or flanges 47 of the collar 41 at the opposite longitudinal edges of the elongated bag 36 are free and unattached and are formed with openings, such as edgewise slots or notches 48 and apertures 49 for cooperation with the bag-supporting arms 19 in the manner which will now be described.

In its initial unmounted condition as seen in FIGS. 5 and 6, the cardboard mounting collar 41 on the bag 36 is flat and undeformed. However, the upper surface of the collar 41 is formed with a pair of scored or weakened lines 51 and 52 extending transversely of the bag 36 between the center opening 42 and the edges 43 and 44, respectively. Thus, the collar 41 has marginal edge portions 53 and 54 which are bendable or foldable downwardly for mounting the collar 41 on the arms 19. As best seen in FIGS. 1 and 4, the arms 19 interlock with the notches 48 in the unattached side flanges 47 of the collar and the edge portions 53-54 of the collar are

bent downwardly to impart a generally channel-shaped or inverted U-shaped cross-sectional configuration to the collar. A plurality of reinforcing fasteners, such as ordinary wire staples 55, may be affixed across the score lines for additional strength. As will readily be understood, the channel-shaped configuration provides an increased degree of structural rigidity in the collar 41 so as to strengthen the same and insure a durable and effective mounting of the filter bag. When the bag 36 is in mounted position on the arms 19, the central sections of the flanges 47 are disposed above the mounting portions 22 of the arms 19 and the downwardly folded collar portions 53 and 54 are disposed below the arms 19, the angular arm portions 31 and 32 serving to retain the collar 41 in its bent channel-shaped form. Moreover, the bosses 33 on the arms 19 project through the holes 49 in the collar so as to insure proper positioning of the bag on the arms 19.

Because of the pivotal mounting 21—24 for the arms 19, the latter are readily swingable away from and toward the notched side flanges 47 of the collar 41. In FIG. 4 the outwardly pivoted position of the arms 19 is shown in dotted lines. Thus, the user can readily remove a used bag by releasing the collar 41 from the locating bosses 33 and swinging the arms 19 outwardly to disengage the same from the notches 48. A new bag can then be installed by bending the collar portions 53 and 54 downwardly, swinging the arms 19 inwardly to engage the notches 48 in the manner shown, and projecting the bosses 33 through the holes 49.

As seen in FIG. 1, an air inlet conduit or nozzle 56 is mounted in the upper casing section or cover 12 for communication with the collar opening 42 and the bag mouth 38. It will be understood that the locating bosses 33 and the cooperating apertures 49 in the collar insure accurate positioning of the bag on the arms 19 so that the air inlet conduit and the mouth of the bag are in proper registry when the cover 12 is assembled on the lower casing section 11. Thus, dirty air is drawn inwardly through the conduit 56 into the expanded bag 36 by the action of the motor-fan unit 17 and the filtered air is discharged through the outlet 18. A cleaning tool hose connector, indicated in dotted lines at 57, may be detachably secured in the inlet conduit 56 in the usual manner. Surrounding the air inlet conduit 56 is an annular resilient seal or gasket 58 of sponge rubber or the like which seats firmly against the upper surface of the collar 41 around the opening 48 when the cover 12 is locked in place thereby maintaining an airtight seal at this point. If desired, the outwardly projecting cantilever portions 31—22—32 of the arms 19 may have a slight degree of resilient yield for further insuring a tight seal between the collar 41 and the gasket 58.

Although the invention has been described with particular reference to a certain specific embodiment thereof, it is to be understood that various modifications and equivalents may be resorted to without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a suction cleaner including a casing having a dirty air inlet, the combination of a pair of bag supporting members supported in spaced relation within the casing at opposite sides of the air inlet, a filter bag having a mouth in a wall thereof for registry with the air inlet, a mounting collar secured to said bag around said mouth, and retaining means comprising openings at the opposite sides of said collar cooperable with said members for detachably interconnecting the same, at least one of said members being swingably supported for movement away from and toward said collar whereby to facilitate engagement and disengagement of said members with respect to said openings during attachment and detachment of the bag.

2. In a suction cleaner including a casing having a dirty air inlet, the combination of a pair of spaced bag

supports pivotally mounted within the casing at opposite sides of the air inlet, a filter bag having a mouth in a wall thereof adapted to be registered with the air inlet, and a mounting collar secured to said bag around said mouth, said collar having openings cooperable with said supports for retaining the collar thereon, and said supports being swingable into and out of engagement with said openings at opposite sides of said collar for facilitating engagement and disengagement of said supports during attachment and detachment of the bag.

3. The combination of claim 2 further characterized in that said supports and said collar are also provided with interfitting projecting portions and aperture means for locating said collar in predetermined position on said supports and insuring registry of said mouth with the air inlet.

4. In a suction cleaner including a casing having a dirty air inlet, the combination of a pair of angular arms having mounting portions pivotally supported in spaced relation on a wall of the casing and bag-supporting portions extending away from the casing wall at opposite sides of the air inlet, a filter bag having a mouth in a wall thereof adapted to be registered with the air inlet, and a mounting collar affixed to said bag around said mouth, said collar having slotted openings extending inwardly from its opposite edge portions for detachably securing the collar to the bag-supporting portions of said arms, and said arms being swingable for moving said bag-supporting portions into and out of engagement with said openings whereby to facilitate attachment and detachment of the bag.

5. The combination of claim 4 further characterized in that the bag-supporting portions of said arms are provided with locating bosses and said collar is also provided with openings adapted to receive said bosses whereby to insure registry of the mouth of the bag with the air inlet.

6. In a suction cleaner including a casing having a dirty air inlet, the combination of a pair of bag supports mounted in spaced relation within the casing at opposite sides of the air inlet, a filter bag having a mouth in a wall thereof adapted to be registered with the air inlet, and a mounting collar secured to said bag around said mouth, said collar having a generally channel-shaped configuration when mounted on said bag supports with the longitudinal channel axis disposed transversely between said bag supports, said collar being detachably engageable at the opposite open ends of the channel with said bag supports, and said supports being shaped to retain said collar in said channel-shaped configuration.

7. In a suction cleaner including a casing with a dirty air inlet, the combination of bag support means pivotally mounted within the casing, a filter bag having a mouth adapted to be registered with the air inlet, and a mounting collar affixed to said bag around said mouth and having at least one opening cooperable with said support means, said support means being swingable into and out of engagement with said opening whereby to facilitate attachment and detachment of the bag and being shaped so as to retain said collar in a generally channel-shaped configuration when mounted on said support means with the longitudinal channel axis disposed transversely relative to said bag support means thereby imparting increased rigidity to the collar.

8. In a suction cleaner including a casing having a dirty air inlet, the combination of a pair of bag supporting members pivotally mounted in spaced relation within the casing at opposite sides of the air inlet, a filter bag having a mouth adapted for registry with the air inlet, and a mounting collar affixed to said bag around said mouth, said collar having a generally U-shaped configuration when mounted on said members and defining a channel with the longitudinal channel axis extending transversely between said members, said collar having retaining means comprising slotted openings at its opposite

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edge portions detachably connectable with said bag supporting members, said members also having an angular generally U-shaped configuration for retaining said collar in said configuration and said members being swingable into and out of engagement with said slotted openings for facilitating attachment and detachment of the bag.

9. The combination of claim 8 further characterized in that said slotted openings are adapted to receive said bag supporting members with portions of the collar disposed at opposite sides of said members.

10. The combination of claim 8 further characterized in that said collar also has apertures in said edge portions and said members have bosses extending into said apertures for locating the collar in position to insure registry of said mouth with the air inlet.

11. In a suction cleaner filter bag having a mouth in a wall portion thereof, the improvement comprising a generally rectangular flat collar of relatively stiff material secured to the bag around said mouth, said collar having score lines at opposite sides of said mouth providing foldable portions at one pair of opposite marginal portions of the collar, said foldable portions being bendable in the same direction from the plane of the collar to provide a generally inverted U-shaped cross-sectional configuration imparting increased rigidity to the collar, and means comprising openings disposed adjacent said score

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lines at the remaining opposite marginal portions of said collar for detachably mounting the same on a bag support.

12. The article of claim 11 further characterized in that said means comprises a plurality of edgewise notches in said collar.

13. The article of claim 11 further characterized in that said remaining opposite marginal portions are also provided with aperture means intermediate said score lines cooperable with locating means on the bag support for insuring accurate positioning of the bag on the support.

14. The article of claim 11 further characterized in that said collar has rounded corner portions with a straight edge portion therebetween.

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