Aug. 8, 1961 C. B. SMITHSON 2,995,206

FILTER BAG MOUNTING MEANS FOR SUCTION CLEANER

Filed Aug. 13, 1959 2 Sheets-Sheet 1

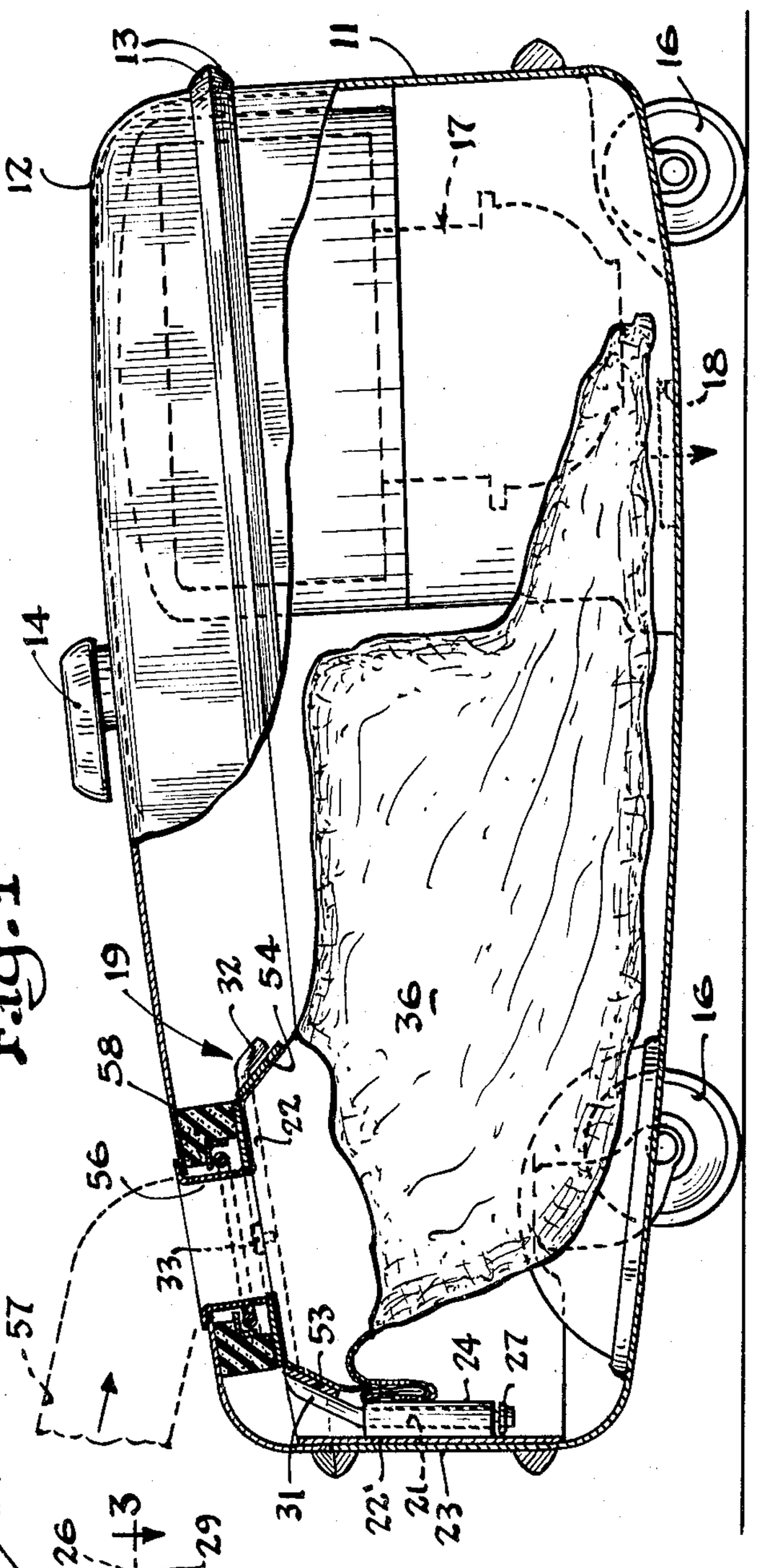

Fig. 1

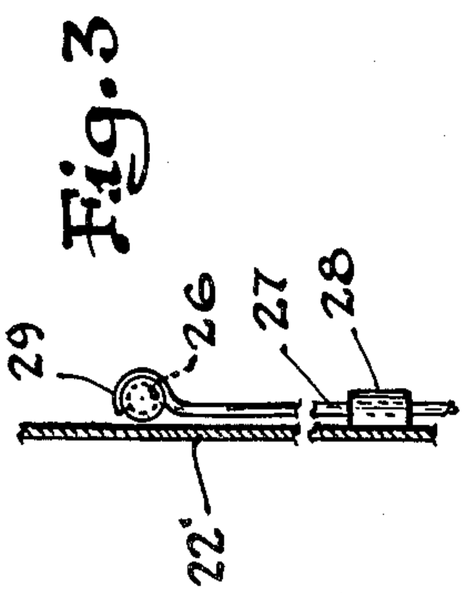

Fig. 3

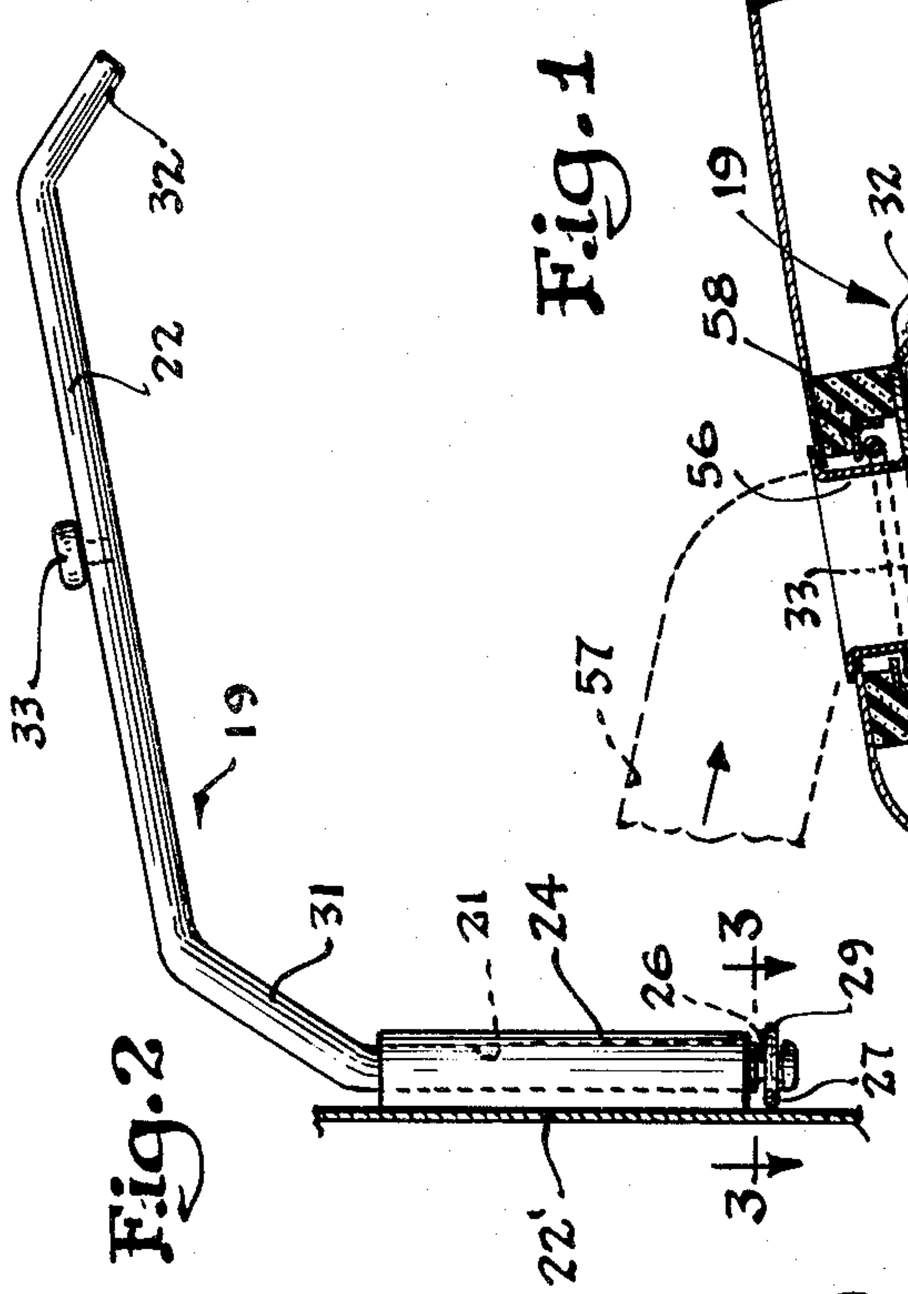

Fig. 2

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Fig. 4

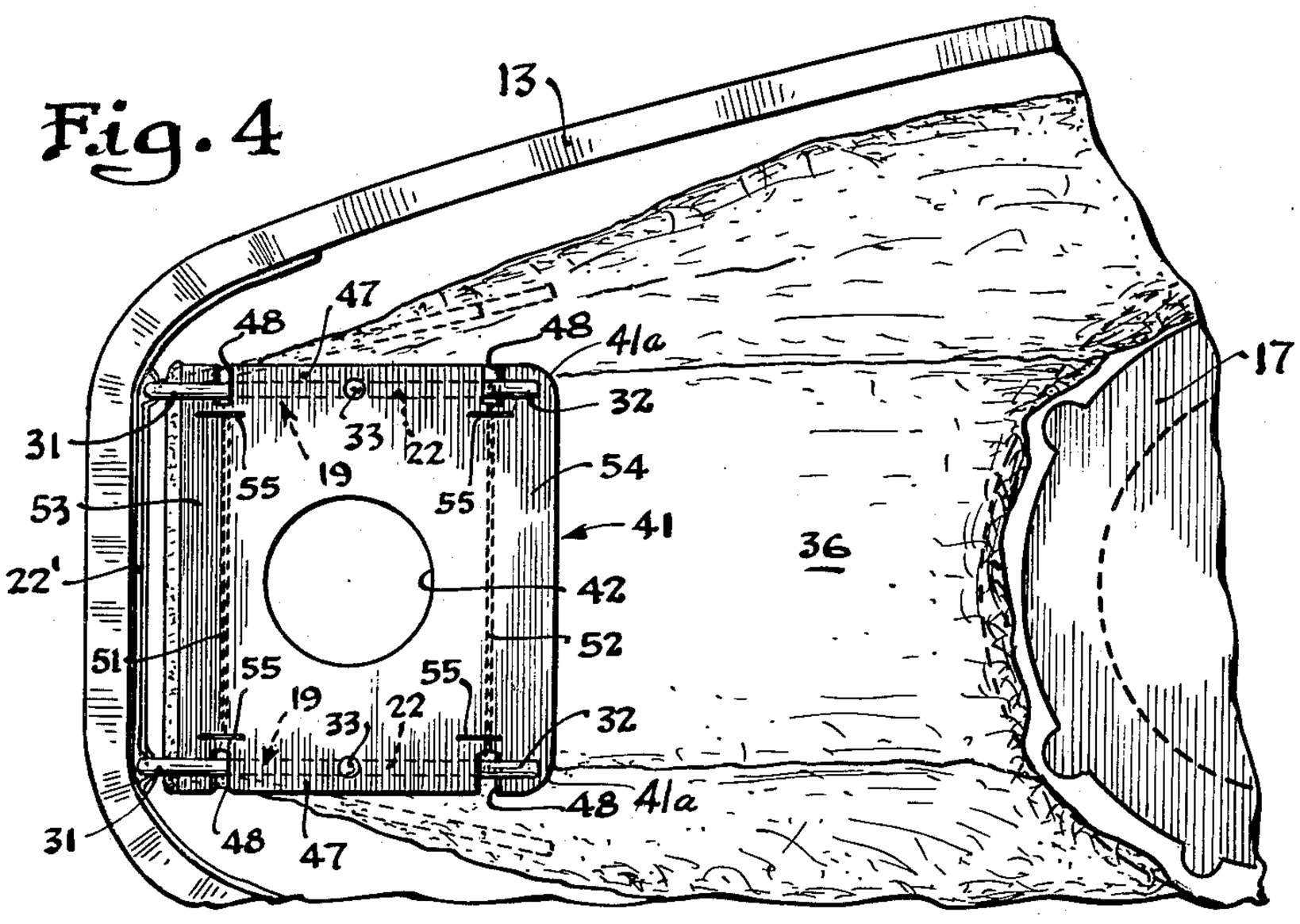

Fig. 5

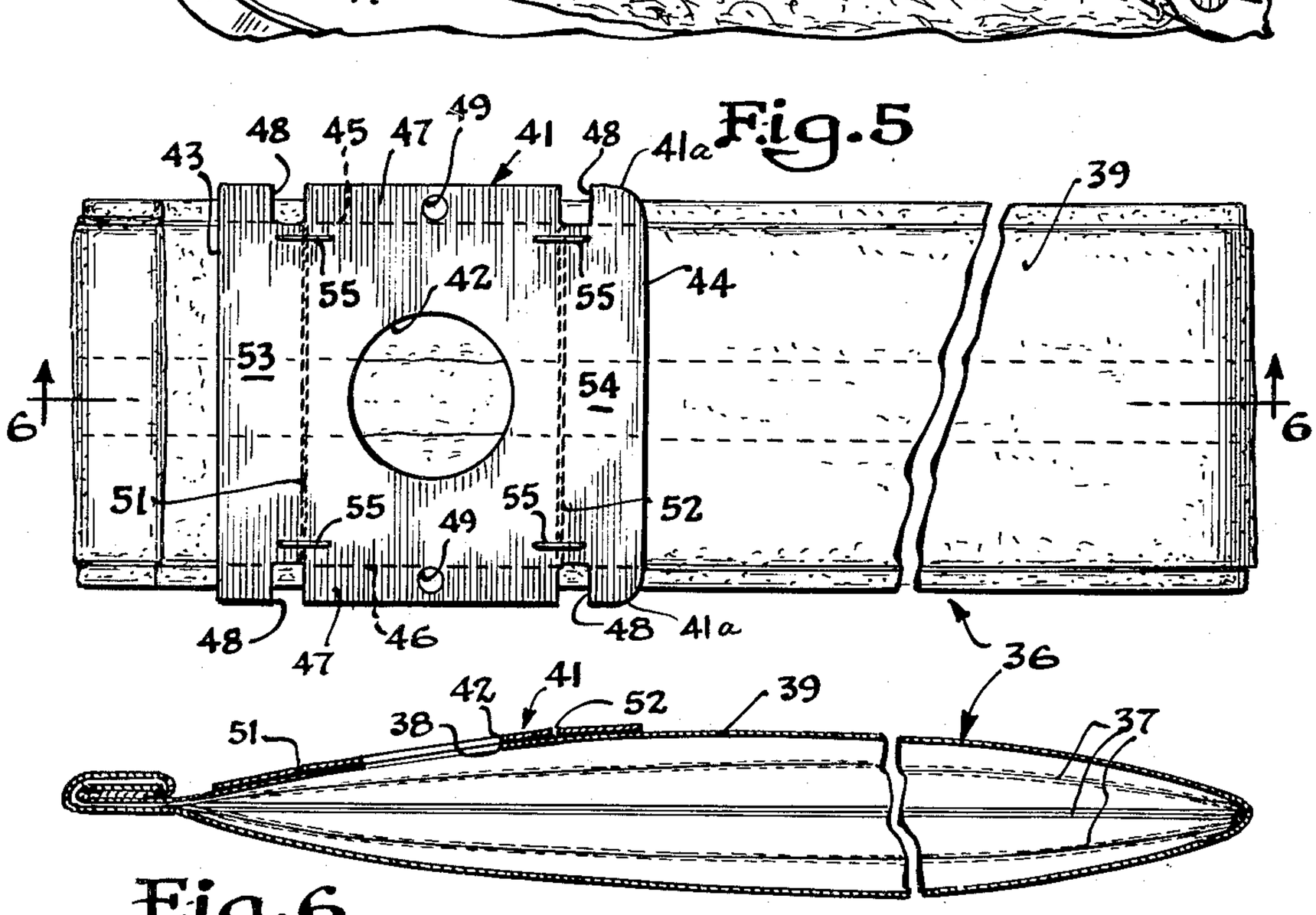

Fig. 6

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2,995,206

Patented Aug. 8, 1961

2,995,206

FILTER BAG MOUNTING MEANS FOR SUCTION CLEANER

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Filed Aug. 13, 1959, Ser. No. 833,614
14 Claims. (Cl. 183—51)

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

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 **41***a*, 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

edge portions detachably connectable with said bag supporting members, said members also having an angular generally U-shaped congfiuration 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

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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