Dec. 2, 1952 E. C. BINGGELY 2,620,045

SUCTION CLEANER BAG

Filed Sept. 6, 1951 3 Sheets-Sheet 1

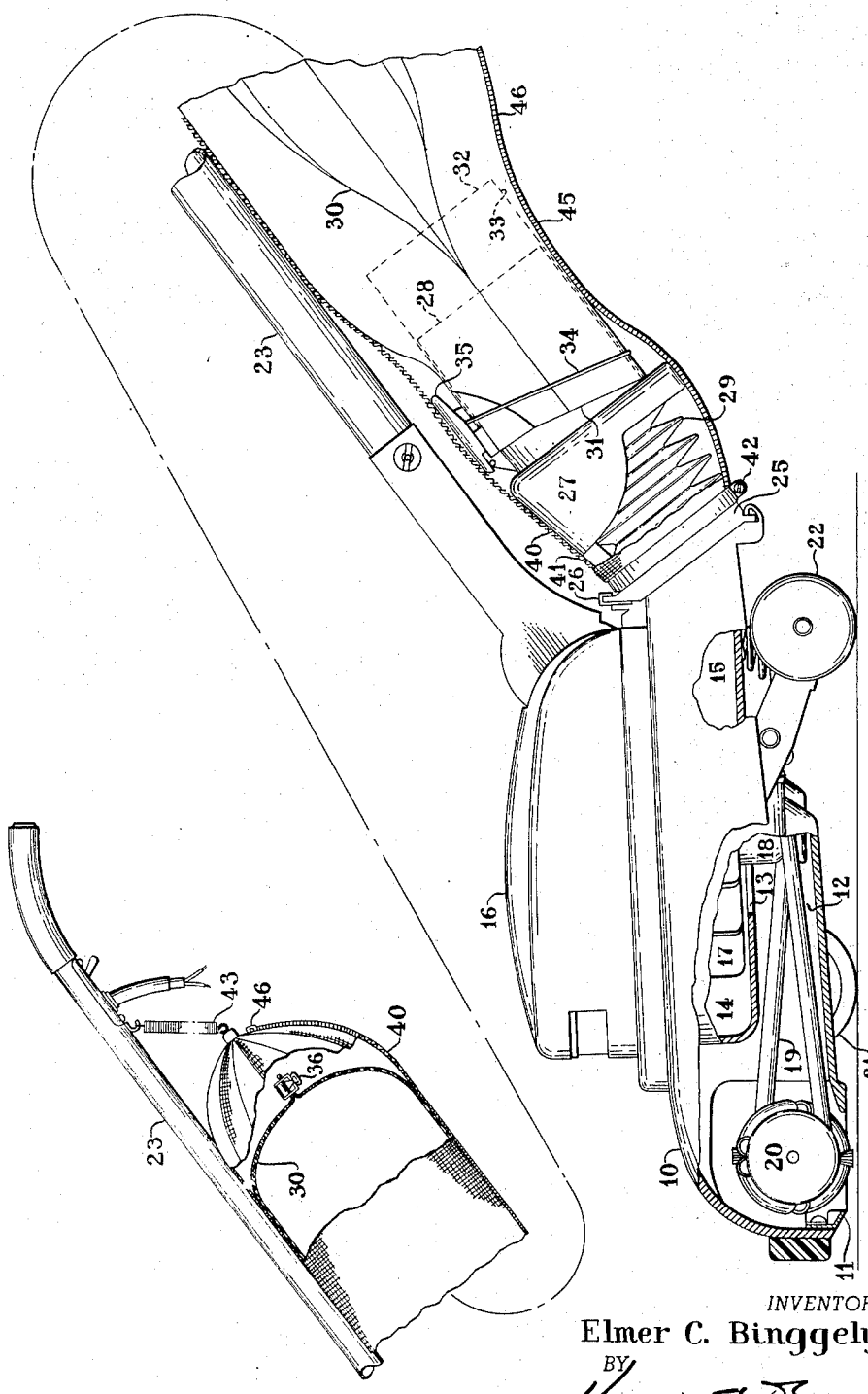


Fig. 1

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SUCTION CLEANER BAG

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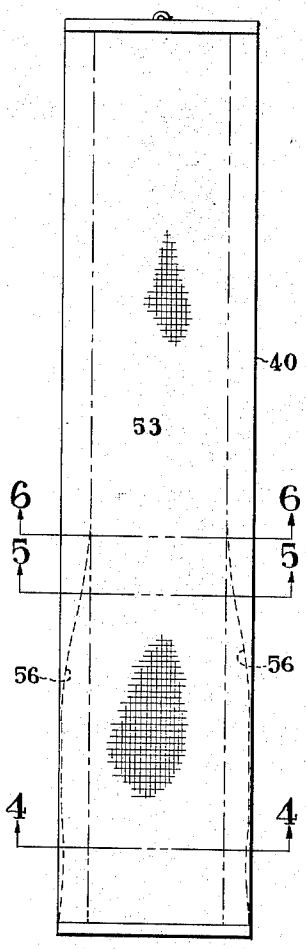


Fig. 2

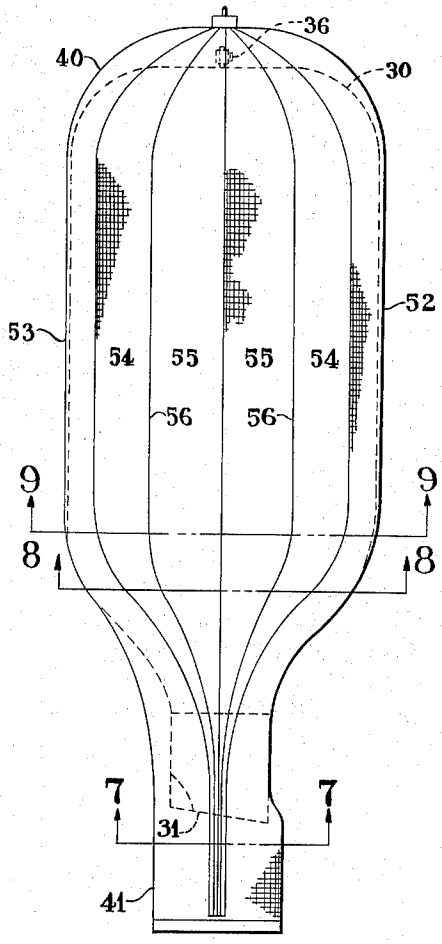


Fig. 3

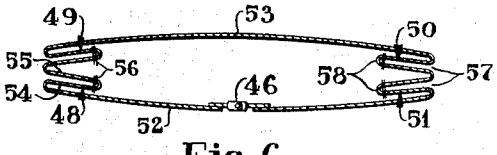


Fig. 6

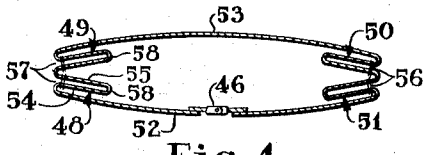


Fig. 4

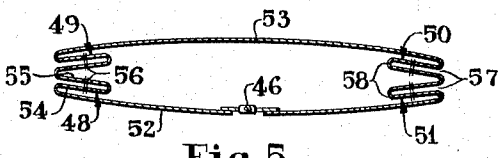


Fig. 5

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SUCTION CLEANER BAG

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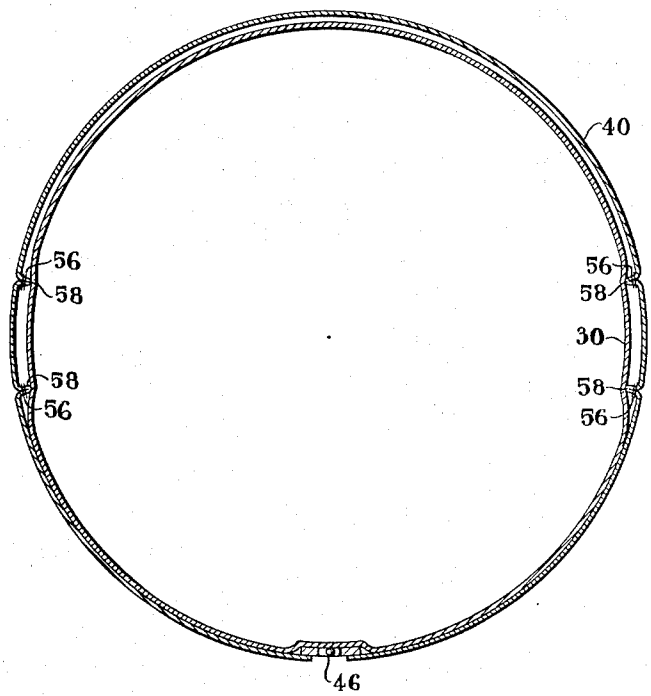


Fig. 9

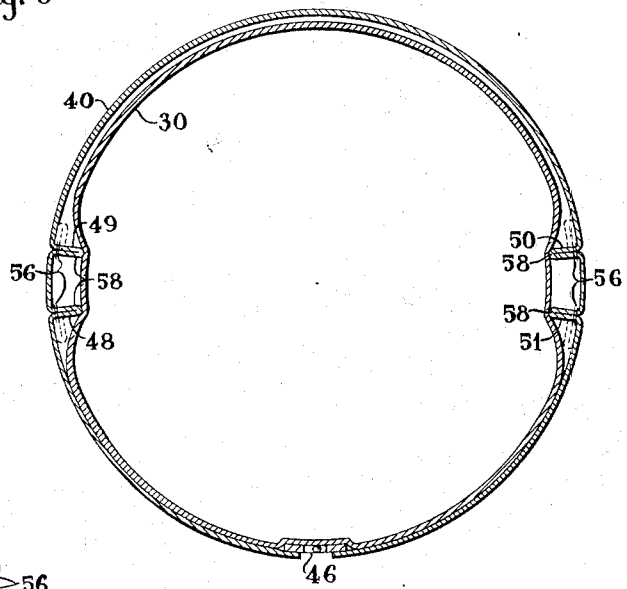


Fig. 8

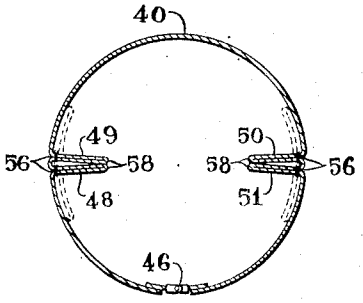


Fig. 7

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UNITED STATES PATENT OFFICE

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SUCTION CLEANER BAG

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Application September 6, 1951, Serial No. 245,343

5 Claims. (Cl. 183—51)

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The present invention relates to suction cleaners and more particularly to an outer envelope for supporting an inner dirt filtering bag.

In suction cleaners employing an inner filter bag and an outer enclosure, the inner bag is usually formed of paper or other fragile materials which must be supported in some manner at its lower end where the dirt accumulates to prevent failure of the inner bag caused by the collected dirt.

It is an object of the invention to provide an outer enclosure for an inner filter bag to reinforce the latter and prolong the use of the bag. Another object is to provide an outer envelope for an inner dirt filtering bag, the outer envelope having pleats secured together to confine the inner bag at its dirt accumulating portion and permitting full inflation of the remaining portion of the inner bag.

Other objects and advantages of the invention will be apparent from the following description and drawings wherein:

Figure 1 is a side view, partly in section, of a suction cleaner with a double bag;

Figure 2 is a view of the outer bag when uninflated and removed from the cleaner body;

Figure 3 is a view of the inner and outer bags showing their contours when inflated;

Figures 4, 5 and 6 are sectional views along the lines 4—4, 5—5 and 6—6 of Figure 2 showing the stitching for securing the bag pleats, and

Figures 7, 8 and 9 are sectional views along the lines 7—7, 8—8 and 9—9 of Figure 3 showing the progressing enlargement of the outer bag as provided by the stitched pleats when the inner bag is inflated.

The embodiment of the invention herein disclosed comprises a suction cleaner body 10 having a surface cleaning nozzle 11 communicating through a passageway 12 with a fan eye 13 of a fan chamber 14 provided with an exhaust passageway 15. A housing 16 encloses an unshown motor for driving a fan 17 and a pulley 18 connected by a belt 19 to an agitator 20 rotatably mounted in the nozzle 11. The cleaner body is supported by front and rear wheels 21 and 22 respectively, and is provided with a pivotally mounted handle 23.

A bag ring 25 is removably attached to the end of the exhaust passageway 15 by a clamp 26 and pivotally supports a bag adapter 27 having a projecting tubular portion 28 connected to the bag ring 25 by a flexible bellows 29. The inner bag 30 is formed from paper or other suitable dirt filtering material and is provided in its mouth 31

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with a valve 32 of flexible material which telescopes the tubular member 28 and has a projecting portion 33 to prevent dirt from falling downwardly into the tubular member 28. The bag mouth 31 of the inner bag is removably attached to the tubular member 28 by a band 34 actuated by a lever 35, and the dirt emptying opening at the opposite end is closed by a removable clamp 36.

The outer bag 40 is formed of cloth or other suitable filtering or non-filtering material and has its lower end 41 attached to the bag ring 25 by a clamp 42 and its upper end is supported from the handle 23 by spring 43. An opening 45 extends longitudinally of the bag 40 and has a slidable fastener 46 providing for access to the bag clamp lever 35 to removably attach the inner bag 30 to the adapter 27.

The lower portion of the outer bag 40 is provided with pleats 48 to 51 and exterior walls 52 and 53. The pleats 48 to 51 are each formed of folded portions 54 and 55. The expansion of the pleats 48 to 51 is controlled by stitch lines 56 which extend from the lower end of the bag at the open ends 57 of the pleats, as shown in Figure 4, and then upwardly and inwardly as shown in Figure 6 to the closed ends 58 of the pleats. The stitching 56 of the pleats, as shown in Figures 4 and 7, prevent the pleats 48 to 51 from expanding and constricts the outer bag relative to the adapter. As shown in Figures 5 and 8, the stitch lines 56 extend partially into the pleats 48 to 51 to permit enlargement of the bag to intimately engage the inner bag and support the latter and the weight of the dirt collected in the bag 30. At Figures 6 and 9, the stitch lines 56 are at the closed ends 58 of the pleats whereby the folded material 54 and 55 of each pleat is completely expanded to further enlarge the cross section of the bag and also support the inner bag 30.

Although Figure 7 shows the pleats 48 to 51 projecting inwardly of the bag, they are placed in the dotted line positions to provide the lower end 41 of the outer bag with a plurality of thicknesses of material to reinforce the bag mouth at its attachment to the bag ring 25. Also in Figure 8, the inwardly projecting pleats 48 to 51 assume the dotted line positions when the inner bag 30 is inflated.

In order to removably attach the inner bag to the adapter 27, the slide fastener 46 is moved downwardly to the bag clamp 42 and the outer bag is telescoped downwardly below the bag clamp lever 35 whereby the latter can be operated to remove and attach the valve 32 about the tubular

member 28 which supports the lower end of the bag. If it is desired to remove dirt from the inner bag the clamp 36 at the upper end of the bag is removed.

When the nozzle is moved over the surface to be cleaned, the suction created by the fan 17 draws the dirt laden air through the nozzle 11 and discharges it through the exhaust passageway 15 into the inner bag 30. The blast of air passing through the tubular member 28 into the inner bag causes the latter to expand. However, the expansion of the inner bag is controlled by the stitch lines 56 in the pleats of the outer bag. The pleats have a limited expansion adjacent the valve 32 and the tubular member 28 of the adapter 27 to provide a cross sectional area of bag material which will intimately contact the inner bag and support the latter so that the bag 30 is not subjected to the full blast of the air passing therethrough. That portion of the outer bag above the stitch lines 56 is allowed to inflate to the full material of the bag to thereby support the inner bag throughout its area.

From the foregoing it will be perceived that the pleats in the outer bag are stitched to provide a gore tapering upwardly from the mouth of the bag to permit the pleats to gradually expand to their full area and support the inner bag. In addition, the provision of equal pleats throughout the length of the outer bag permits stitching the pleats to form the desired contour without the necessity of cutting the bag material into a reduced section at the bag mouth, and consequently the time for manufacture of the outer bag is greatly reduced.

While I have shown but one embodiment of my invention it is to be understood that this embodiment is to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure shown and described but to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. A filter bag assembly having an inner and an outer bag for attachment to the dirt exhaust passageway of a suction cleaner comprising an inner bag of filtering material having a reduced bag mouth for entrance of dirt laden air and an enlarged dirt collecting portion, and an outer bag enclosing said inner bag, said outer bag having a plurality of pleats extending longitudinally of said inner bag, said pleats having equal folds of material throughout their lengths, and fold securing means extending at an angle from the open ends of said folds to the closed end of said folds adjacent said dirt collecting portion of said inner bag to provide gradual expansion of said outer bag with respect to said inner bag and engage and support the latter at said dirt collecting portion.

2. The filter bag assembly defined in claim 1 wherein said fold securing means comprises stitched lines extending at an angle from the open ends of said folds to the closed ends of the latter.

3. An expansible filter bag for suction cleaners, said bag having a plurality of pleats extending longitudinally of said bag, and means securing the folds of said pleats at an angle from the open ends of said folds to provide a constricted opening at that portion of the folds secured at the outer ends, and gradually increasing the cross section of said bag as said securing means terminate at the inner ends of said folds.

4. A filter bag assembly having an inner and an outer bag for attachment to the dirt exhaust passageway of a suction cleaner comprising an inner bag of filtering material having a reduced bag mouth for entrance of dirt laden air and an enlarged dirt collecting portion, and an outer bag enclosing said inner bag, said outer bag having a pair of connected pleats extending longitudinally of said inner bag, means securing the folds of each pleat and extending at an angle from the open end of each fold to the closed end of each fold, said securing means extending along said mouth and dirt collecting portion of said inner bag to provide for gradual expansion of said pair of pleats with respect to said inner bag and engage and support the latter at said mouth and said dirt collecting portion.

5. An expansible filter bag for suction cleaners comprising pleats extending from the mouth of said bag and longitudinally thereof, said pleats having equal folds of material, and means securing the open ends of said folds at the mouth of said bag to reinforce said mouth, said securing means extending at an angle from said reinforced portion at said open ends of said folds inwardly of said bag to the inner ends of said folds to provide for gradual expansion of said folds to increase the cross section of said bag.

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