July 11, 1967 J. J. FESCO 3,330,100

VACUUM CLEANER FILTER BAG

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FIG. 1

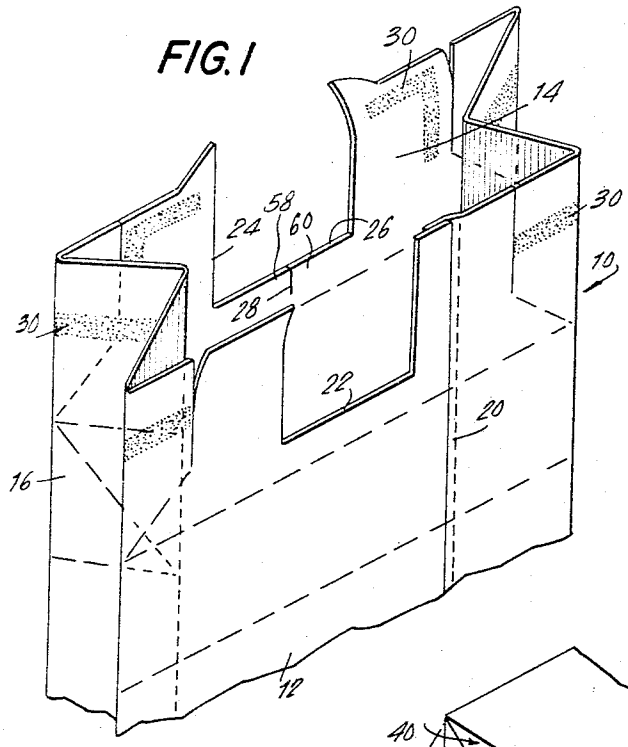
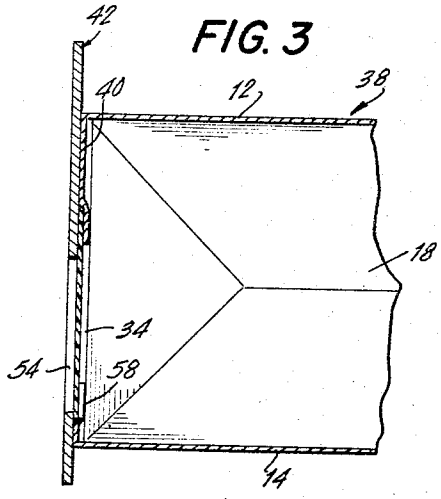


FIG. 3



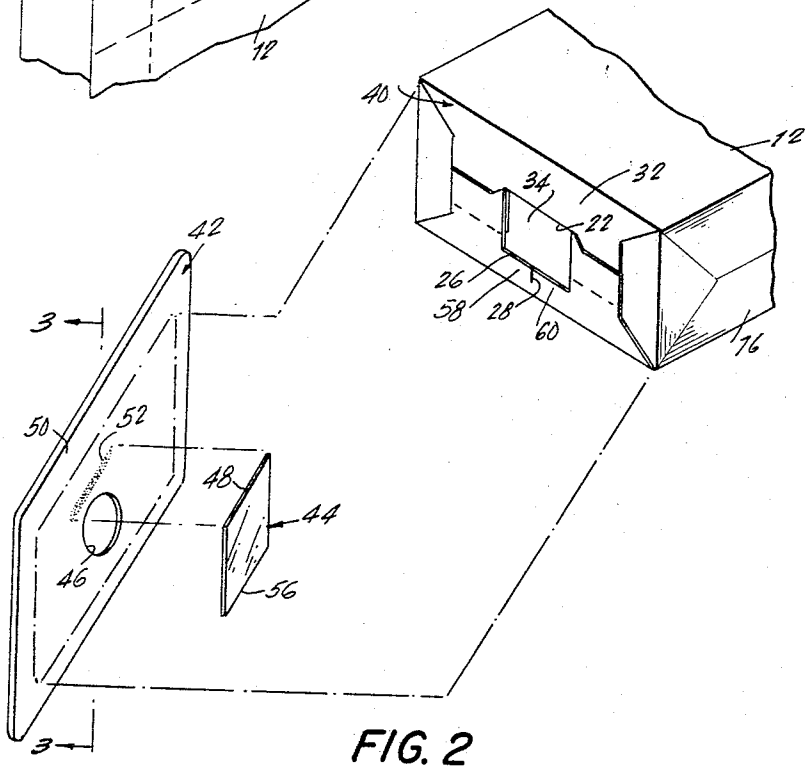


FIG. 2

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FIG. 4

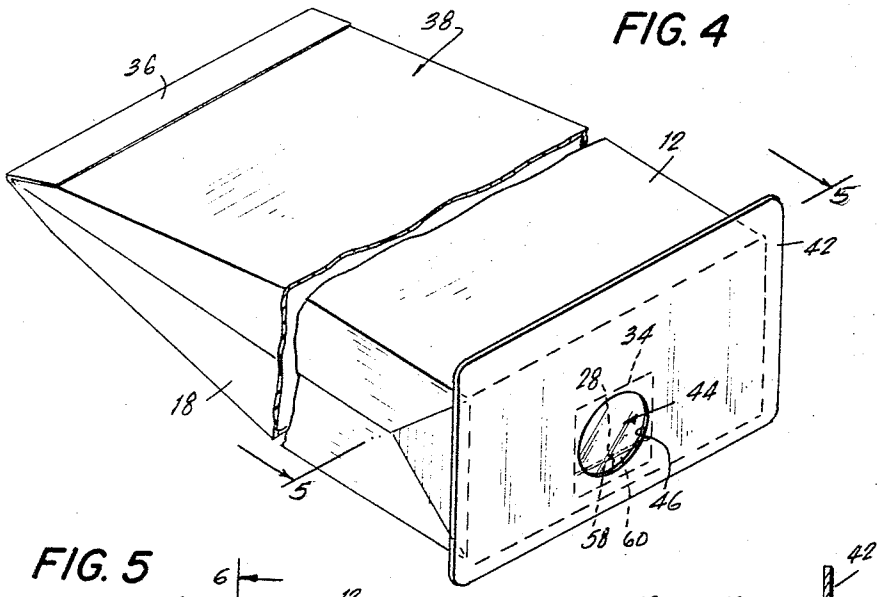


FIG. 5

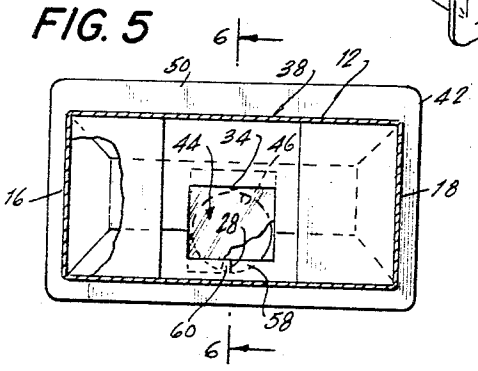


FIG. 8

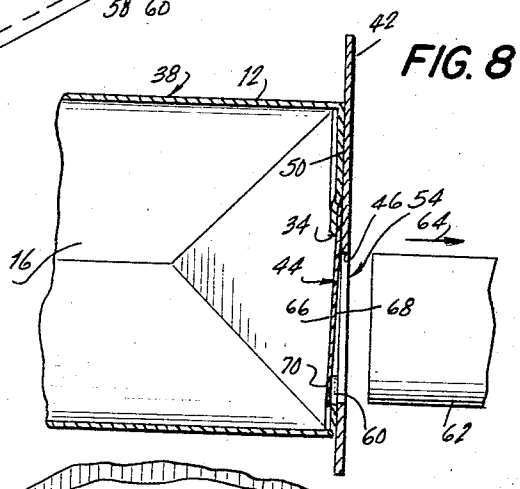


FIG. 6

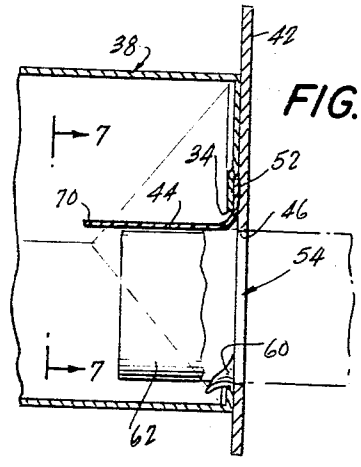
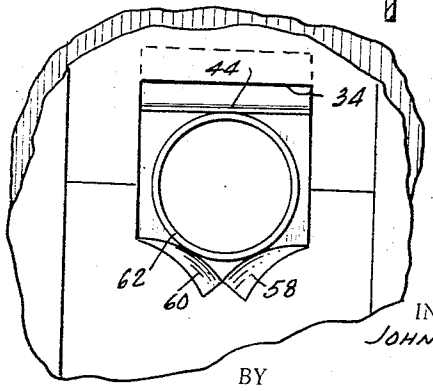


FIG. 7



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VACUUM CLEANER FILTER BAG

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5 Claims. (Cl. 55—367)

The present invention relates in general to vacuum cleaner filter bags and in particular to closure valves therefor.

Expendable or throw-away filter bags of the type to which the present invention relates are mounted in various different positions within a vacuum cleaner tank or canister, depending upon the particular construction of the vacuum cleaner. In certain types of vacuum cleaners, the bag is mounted in an upright position so that the dust-laden air is drawn into the upper end of the bag. In other types of vacuum cleaners, the bag is mounted in a horizontal position with the dust-laden air entering the bag from one end thereof. In still other types of vacuum cleaners, the filter bag although mounted in a vertical or an upright position, has its entrance for the dust-laden air at the bottom end of the bag. In this type of an arrangement, dust within the bag frequently escapes from the bag when the air conduit is removed from the bag prior to the removal of the bag from the vacuum cleaner. Also, in cases where the bag may be mounted in an upright position or in a sidewise position so that the entrance end of the bag for the dust-laden air is not necessarily at the bottom of the bag, nevertheless during the course of removal of the bag from the vacuum cleaner, if the bag is tilted or inadvertently turned so that its upper end faces the floor, dust within the bag may nevertheless escape from the bag.

In view of the foregoing, it is an object of the present invention to provide a vacuum cleaner bag which obviates the foregoing disadvantages of prior art vacuum cleaner bags.

It is another object of the present invention to provide a vacuum cleaner bag from which the dust contained therein will not inadvertently spill during the course of removal of the bag from the vacuum cleaner or when the bag is inadvertently tilted.

It is another object of the present invention to provide a vacuum cleaner bag having a highly novel valve provided at the entrance end thereof through which the dust-laden air enters the vacuum cleaner bag during the course of operation of the vacuum cleaner.

Other and further objects and advantages of the present invention will be readily apparent to those skilled in the art from a consideration of the appended drawings, taken in connection with the following specification.

In the drawings which illustrate the best mode presently contemplated for carrying out the invention, FIGURE 1 is a perspective view of a blank of paper sheet filter material formed into a tube, prior to the formation of the tube into a filter bag pursuant to the present invention. FIG. 2 is an exploded view which illustrates the bottom of a bag pursuant to the present invention showing the entrance opening into the bag and a valve and a collar provided on the end of the bag having the entrance opening. FIG. 3 is a sectional view on an enlarged scale taken on the line 3—3 of FIG. 2 through the bag assembled with the valve and collar. FIG. 4 is a perspective view of a bag pursuant to the present invention. FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4. FIG. 6 is a sectional view on an enlarged scale taken on the line 5—5 of FIG. 5. FIG. 7 is a fragmentary sectional view taken on the line 7—7 of FIG. 6, FIGS. 6 and 7 both showing an air conduit from the vacuum cleaner inserted into the bag, and FIG. 8 is a view similar to FIG. 7 showing the condition of the bag with the air conduit removed therefrom.

Referring now to the drawings in detail and in particular to FIG. 1, there is shown a tube 10 formed of filter paper of the usual type used to form throw-away or expendable filter bags for vacuum cleaners or the like. As here shown, the tube 10 is provided with a front wall 12 and a rear wall 14. The tube 10 is provided also with the opposing pleated or gusseted end walls 16 and 18. The blank from which the tube 10 is formed is folded upon itself and suitably secured, preferably by a suitable adhesive as indicated at the longitudinal seam 20. At the bottom thereof, the tube 10 is provided with a rectangular cut-out or recess 22 provided in the front wall 12 at the bottom edge of the front wall and the rear wall 14 is provided also with a substantially rectangular recess or cut-out 24 provided in the rear wall at the bottom edge thereof. At its horizontal edge 26, the recess 24 is provided with a slit 28, the function of which will presently appear. The tube 10 is provided at its bottom end with suitable lines or strips of an adhesive coating as indicated at 30 so that the bottom end of the tube can be folded and secured closed in conventional manner so as to form the conventional bag bottom 32, as best illustrated in FIG. 2. It will be understood that the bag bottom 32 is a conventional bag bottom of the type used in a vacuum cleaner filter bag except for the provision in the bag bottom 32 of the opening 34 which is defined by the previously mentioned recesses 22 and 24 in the opposing side walls 12 and 14 of the paper tube 10. It will be noted that the end opening 34 is provided along its marginal edge 26 with the previously mentioned slit 28. At its other end, the tube 10 is folded and sealed upon itself to form the closed sealed end 36 of the vacuum cleaner filter bag 38 best shown in FIG. 4. Pursuant to the present invention, the bottom end 40 of the vacuum cleaner bag 38 is provided with a mounting collar 42 and a valve operating member 44.

The collar 42 is formed of suitable rigid material preferably paperboard or cardboard and, as here shown, is in the form of a rectangular member having a substantially central aperture 46 defined therein. The valve member 44 is formed of a preferably rectangular piece of Mylar material or polyester film. The material of which the valve member 44 is formed is transparent and, in addition, is flexible in that it can be bent but is also rigid in that when released from a bent condition thereof, it will immediately snap back to its planar or unstressed condition, substantially with the same speed as in the case of a tensioned spring returning to its untensioned condition. In order to allow for such action of the valve member 44, the latter is secured only along one edge 48 thereof to the inner surface 50 of the collar 42 along a line or stripe 52 of suitable adhesive or bonding material. When so secured along its edge 48, the valve member 44 completely overlies the aperture 46 at the inner surface of the collar 42 and forms therewith a valve which is generally indicated by the reference numeral 54. It will be understood that if the unsecured edge 56 of the valve member 44 is drawn away from the inner surface 50 of the collar 42, the valve member 44 will flex in view of the fact that the upper edge 48 thereof is secured to said inner surface and when the valve member 44 is released, it will snap back in a substantial spring-like action to surface-to-surface or face-to-face abutment with the inner surface 50 to completely overlie the aperture 46 at said inner surface.

The bag 38 is completed by suitably securing the collar 42 to the bottom end 40 of the bag. This may be accomplished in conventional manner by means of a suitable adhesive material. With the collar 42 secured to the bag bottom 40, the valve member 44 will completely overlie

the opening 34 in the bag bottom so that it will be disposed between the opening 46 in the collar and the opening 34 in the bag bottom, as best shown in FIG. 3, so as to provide a closure for the valve 54 between the collar and the bottom of the bag which normally closes the valve 54 at the bottom of the bag.

The previously mentioned slit 28 defines a pair of cooperating flaps 58 and 60 at the marginal edge 26 of the opening 34. When the collar 42 is originally secured to the bag, the paper flaps 58 and 60 will be disposed at the inner surface of the valve member 44, namely the surface thereof which faces into the bag 38 and away from the collar 42, as best shown in FIG. 3. Consequently, it will be apparent that, as best shown in FIG. 5, the flaps 58 and 60 are interposed between the valve member 44 and the interior of the bag 38.

It will be understood that the bag 38 may be mounted in conventional fashion within a conventional vacuum cleaner tank or canister. While reference has been made to the fact that the bag would normally be mounted with the collar 42 thereof lowermost or at the bottom of the bag, it will be understood that it is within the concept of the present invention to also utilize the bag 38 in a vacuum cleaner where the collar 42 is mounted at the upper end of the bag or wherein the bag is mounted in a horizontal position, as shown for example in FIG. 4. In any case, the dust-laden air is directed into filter bag 38 by means of a conventional air conduit 62. Referring to FIGS. 6 and 7 in detail, it will be apparent that when the air conduit 62 is inserted into the bag 38 through the valve 54, the flexible valve member 44 will be flexed from its normal closed condition, as shown in FIGS. 4 and 5, to a bent condition thereof, as shown in FIG. 6. Consequently, it will be apparent that the insertion of the conduit 62 into the bag 38 through the opening in the collar 42 as showing in FIG. 6 will cause the flexing or stressing of the valve member 44 as the latter is moved from its valve closing condition shown in FIGS. 4 and 5 to its valve open condition shown in FIGS. 6 and 7. Said inward movement of the valve member 44 will move the latter past and beyond the flaps 58 and 60, the flaps yielding or flexing inwardly of the bag as best shown in FIGS. 6 and 7 in response to the inward movement of the valve member 44. Upon retraction of the conduit 62 from the bag 38 as indicated by the arrow 64 in FIG. 8, the stressed valve member 44 will snap back with a substantially spring-like action from the open condition thereof shown in FIG. 6 to the closed position thereof shown in FIG. 8. However, it will be noted that now the flaps 58 and 60 will be disposed at the outer surface of the valve member 44, between the valve member 44 and the collar 42 in the closed condition of the valve 54. This results from the fact that the bent flaps 58 and 60 are in the path of the return movement of the valve member 44 as it returns from its open condition shown in FIGS. 6 and 7, to its closed condition shown in FIG. 8. Thereafter, it will be understood that since the flaps 58 and 60 are now disposed at the outer rather than the inner surface of the valve member 44, subsequent inner movements of the valve member 44 in order to open the valve 54 will have no further effect upon the position of the flaps 58 and 60. However, said flaps will be moved inwardly directly by the conduit 62. Nevertheless, the return movement of the valve member 44 to its valve closed condition will always return the flaps 58 and 60 to a position at the outer surface of the valve member 44.

In view of the foregoing, it will be apparent that the flaps 58 and 60 serve as a support for the valve member 44 along its free edge when the conduit 62 is withdrawn from the bag so that the valve member and flaps are in the condition thereof shown in FIG. 8. More specifically, this will be apparent due to the fact that the bag 38 is normally disposed within the vacuum cleaner so that the collar 42 thereof is at the bottom end of the bag and the closed end 36 thereof is at the top end

of the bag. In such circumstances, the dirt or dust within the bag will tend to fall upon the inner surface of the valve member 44, namely the surface thereof facing into the bag and which surface is generally indicated by the reference numeral 66 in FIG. 8, the outer surface thereof being indicated by the reference numeral 68. In such circumstances, it will be apparent that the flaps 58 and 60 will tend to provide a support for the flexible valve member 44 at its outer surface against the weight of the dust and dirt weighing against the inner surface 66 of the valve member. Moreover, the flaps 58 and 60 will also improve the nature and character of the seal provided by the valve member 44 in the closed condition thereof, said seal being provided at the free edge 70 of the valve member 44 so as to prevent the escape of the trapped dust within the bag. Also, it will be readily apparent that the transparent characteristic of the valve member 44 will provide for visibility into the the interior of the bag so that the contents thereof may be readily observed.

The foregoing characteristics of the valve 54 will also be readily apparent even if the bag 38 is mounted in a position in a particular vacuum cleaner wherein the collar 42 is not at the bottom of the bag. In such cases, the valve 54 will prevent inadvertent discharge of the contents of the bag when the bag is being removed from the vacuum cleaner, as for example in the case where the bag is disposed in a vacuum cleaner with a collar 42 uppermost or where the bag is disposed in a vacuum cleaner wherein the bag is in normal horizontal condition. In all cases, it will be apparent that the valve 54 will prevent the inadvertent escape of the dust both during removal of the bag from the vacuum cleaner and after the bag has been removed from the vacuum cleaner so as to prevent said discharge of the dust when the bag is inadvertently tilted.

In view of the foregoing, it will be apparent that there has been illustrated and described in a highly novel filter bag for a vacuum cleaner or the like provided with a highly novel valve closure assembly: It will be apparent that various changes or modifications may be made within the bag of the present invention without, however, departing from the basic inventive concept thereof as set forth in the appended claims.

I claim:

1. A filter bag assembly for a vacuum cleaner having an air conduit associated therewith comprising a bag having an end wall, said end wall having an aperture defined therein, a collar having an aperture defined therein, said collar mounted on said end wall in a position aligning said collar aperture substantially in register with said end wall's aperture, a bendable resilient planar valve member adapted to open and close said apertures, said resilient member having opposing marginal edges and being mounted between said collar and said end wall and connected thereto along one of said marginal edges only, said member being normally disposed to close both of said apertures and being bendable through the aperture of said end wall into the interior of said bag in response to bending pressure applied thereon by means of said air conduit thereby opening said apertures, said valve member resiliently returning with a spring-like action to close said apertures on discontinuance of bending pressure on said valve member, said end wall having flap means defined therein, said flap means contacting said resilient member in the closed position thereof, said flaps defining a portion of the end wall area through which said resilient member is bendable.

2. A filter bag assembly for a vacuum cleaner having an air conduit associated therewith comprising a bag having an end wall, said end wall having an aperture defined therein, a collar having an aperture defined therein, said collar mounted on said end wall in a position aligning said collar aperture substantially in register with said end wall's aperture, a bendable resilient planar member

adapted to open and close said apertures, said resilient member having opposing marginal edges and being mounted between said collar and said end wall and connected to said collar along one of said marginal edges thereof, said member being normally disposed to close both of said apertures and being bendable through the aperture of said end wall into the interior of said bag in response to bending pressure applied thereon by means of said air conduit thereby opening said apertures, said valve member resiliently returning with a springlike action to close said apertures on discontinuance of bending pressure on said valve member, said end wall having flap means defined therein, said flap means contacting said resilient member in the closed position thereof, said flap means having an inner surface and an outer surface, said resilient member having an inner surface and an outer surface, the resilient member inner surface contacting the flap means outer surface when the member is normally disposed to close said apertures, the resilient member outer surface contacting the flap means inner surface when the member resiliently self-returns and closes said apertures, said flaps defining a portion of the end wall area through which said resilient member is bendable.

3. A filter bag assembly according to claim 2 wherein said resilient member is transparent.

4. A filter bag assembly according to claim 2 wherein said resilient member is formed of resilient plastic sheet material.

5. A filter bag assembly according to claim 2 wherein said resilient member is formed of resilient polyester film material.

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