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FILTER BAG FOR VACUUM CLEANING AND COLLAR THEREFOR

Filed Dec. 18, 1964

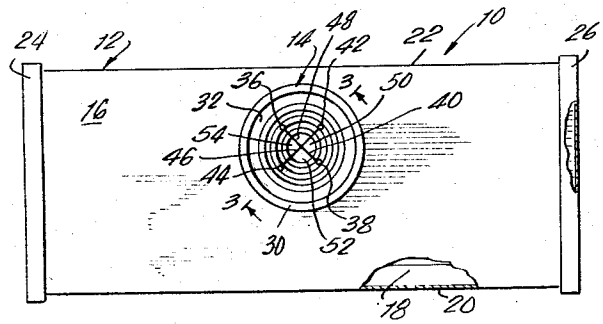


FIG. 1

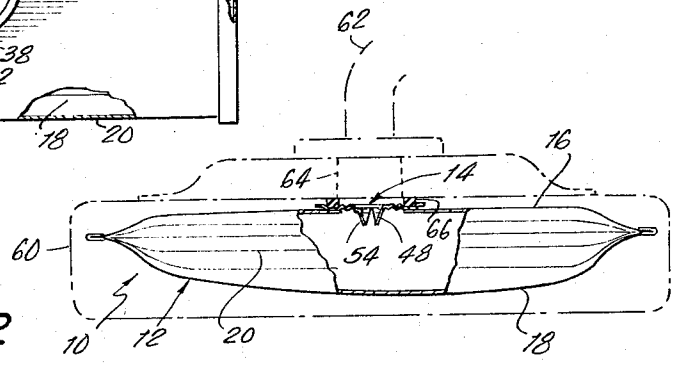


FIG. 2

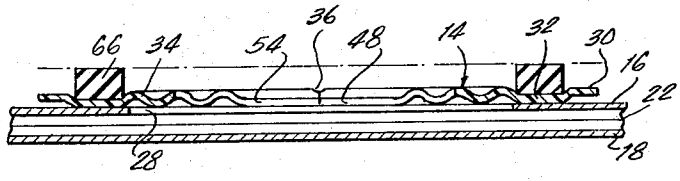


FIG. 3

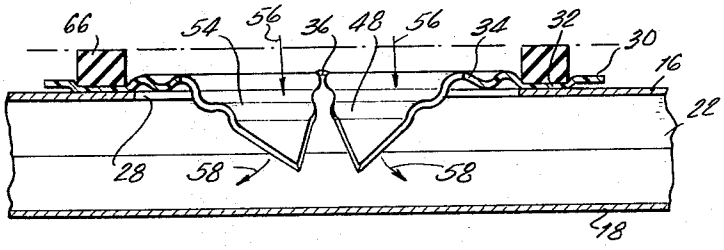


FIG. 4

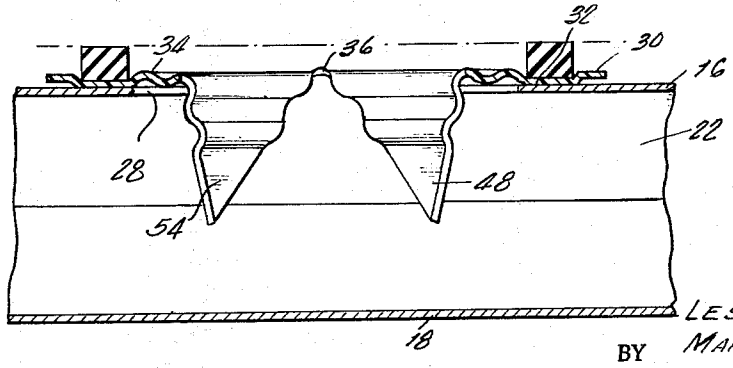


FIG. 5

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FILTER BAG FOR VACUUM CLEANERS AND COLLAR THEREFOR

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2 Claims. (Cl. 55—367)

The present invention relates in general to filter bags for vacuum cleaners or the like and in particular to collars for such bags.

It is an object of the present invention to provide a filter bag for a vacuum cleaner or the like which bag is provided with a highly novel and efficient collar which will have a relatively long life.

It is another object of the present invention to provide a collar for a filter bag of the described type which collar constitutes an air valve which opens in response to air pressure applied thereto.

It is another object of the present invention to provide such a collar valve which is formed as a unitary member from relatively inexpensive sheet material.

It is a further object of the present invention to provide such a collar valve which is constructed in such a manner so as to provide the latter with readily flexible portions which respond to air pressures or the like in a readily facile manner.

Other and further objects and advantages of the present invention will become readily apparent to one skilled in the art from a consideration of the following specification taken in connection with the appended drawing.

In the drawing, which illustrates the best mode presently contemplated for carrying out the invention:

FIGURE 1 is a top plan view of a filter bag pursuant to the present invention with portions broken away for purposes of illustration;

FIGURE 2 is a side elevational view of the filter bag in operative condition thereof disposed within a vacuum cleaner or the like;

FIGURE 3 is a sectional view on an enlarged scale taken on the line 3—3, the bag being shown in the collapsed or inoperative position thereof;

FIGURE 4 is a view similar to FIG. 3 with the bag being shown in an intermediate or partially open condition thereof; and

FIGURE 5 is a view which illustrates the bag in the fully open condition thereof.

Referring now to the drawings in detail, there is shown a filter bag **10** pursuant to the present invention. The bag **10** is provided with a bag body **12** which is provided with a collar valve **14** pursuant to the present invention.

The bag body **12** is of conventional construction, being formed of flexible sheet filter material. As here shown, the bag body **12** is provided with the front wall **16**, a rear wall **18** and flexible side walls **20–22**. The bag body is folded over and sealed at the opposite ends **24–26** thereof. In order to allow for the entry of dust laden air into the interior of the bag body **12**, the front wall **16** thereof is provided with an aperture or opening **28**.

Pursuant to the present invention, the aperture **28** is closed by means of the previously mentioned collar valve. More specifically, and as here shown, the collar valve is constituted by a unitary collar member which as here shown is of circular conformation so as to be complementary to the circular aperture **28**. The collar member **14** is formed of suitable flexible sheet material and in the present embodiment is formed of vacuum formed plastic material which has the required degree of flexibility to achieve the purposes of the present invention. As best shown in FIGS. 3, 4 and 5, the unitary collar valve **14** is provided with an outer rim **30** inwardly of which there

is provided a depressed circular securing portion **32**. It will be noted from FIG. 3 that the diameter of the collar valve **14** exceeds the diameter of the aperture **28** so that both the securing portion **32** and the rim **30** extend outwardly of the aperture **28**. The collar valve **14** is mounted in operative position by adhesively securing the securing portion **32** thereof about the aperture **28** as best shown in FIGS. 3, 4 and 5. Inwardly of the securing portion **32**, the collar valve **14** is provided with a series of circular concentric corrugations or raised ridges **34** which serve to assist or increase the flexibility of the collar member **14**.

Pursuant to a highly novel aspect of the present invention, the collar member **14** is provided in the central portion thereof with a first pair of apertures **36** and **38** which are interconnected by a slit **40** and with a second pair of circular apertures **42** and **44** which are interconnected by a slit **46**. It will be noted that the slits **40** and **46** extend diagonally between the associated pairs of holes and intersect each other in right angular relation so as to define four flexible segments or portions **48**, **50**, **52** and **54**. In the normal condition thereof, the flexible segments are within the plane of the collar member **14** and overlie the aperture **28** so as to close the latter since the segments are in the inoperative or closed condition thereof as best shown in FIG. 3. However, when the opposite surfaces of the flexible segments are subjected to a difference in air pressure with the larger amount of pressure being applied to the outer surfaces of the flexible segment as indicated by the arrows **56** in FIG. 4, the segments flex downwardly and inwardly into the interior of the bag body **12** moving outwardly to the open condition thereof as indicated by the arrows **58** in FIG. 4. The movement of the segments in the direction of the arrows **58** causes the segments to move or spread apart so as to open the collar valve **14** as illustrated in FIGS. 4 and 5. FIG. 4 illustrates the collar valve in a partially open condition thereof and FIGS. 2 and 5 illustrate the collar valve in the fully open condition thereof. When the pressure differential is discontinued so that the pressures on the opposite surfaces of the flexible segments are equal, the flexible segments will snap back from the fully open condition thereof illustrated in FIG. 5 to the closed condition thereof illustrated in FIG. 3 so as to close the valve.

FIG. 2 illustrates the vacuum cleaner filter bag **10** pursuant to the present invention mounted within the tank or cannister **60** of a vacuum cleaner. Conduit **62** illustrates a conventional inlet conduit through which the dirt laden air is borne by suction pressure into the cannister **60**, a coupling member **64** extending from the conduit **62** to a gasket or bearing **66** which abuts the collar **14**.

As previously indicated, FIG. 3 illustrates the condition of the bag **10** in the inoperative condition of the vacuum cleaner **60**. When the vacuum cleaner **60** is rendered operative so that the necessary suction is developed, the difference in pressure on the opposite surfaces of the valve segments causes the latter to spread apart inwardly into the bag body **12** through the opening **28** defined therein, the bag expanding as shown in FIG. 4 from its normally collapsed condition as shown in FIG. 3. Continued application of the suction pressure causes the complete opening of the collar valve as shown in FIG. 5 with the bag being fully expanded as shown in said figure and in FIG. 2. In this condition of the bag, the dirt laden air is drawn inwardly through the open collar valve into the filter bag **12**, the air passing through the walls of the filter bag and the dust remaining in the bag. Upon discontinuance of the suction, there no longer is a pressure differential upon the opposite surfaces of the valve segments so that the latter automatically snaps back to normal closed condition shown in FIG. 3.

In view of the foregoing, it will be apparent that there has been illustrated and described a highly novel vacuum

cleaner filter bag which is provided with a highly efficient and relatively inexpensive collar valve operable in response to the application of air pressure thereto or to a difference in air pressure at the opposite surfaces of the valve segments. It will be understood that various changes and modifications may be made within the present invention without however departing from the basic inventive concept thereof as set forth in the appended claims.

We claim:

1. A vacuum cleaner filter bag comprising a bag body formed of filter sheet material, said body having an opening defined in a wall thereof, a unitary valve collar mounted on an exterior surface of the bag and overlying said opening, the diameter of said collar being greater than the diameter of said opening, said collar having a securing portion which encompasses said opening and is secured to said exterior surface, and a gasket overlying said securing portion and secured thereto, said collar being formed of a flexible material and having a plurality of slits extending radially outwardly from the center of the collar to define slitted portions which are deflectable from the plane of said collar into said bag opening in response to air pressure to define a valve opening in communication with the interior of said bag, said slitted portions being returnable to said planar disposition thereof in the absence of air pressure to close said valve opening, said collar valve being a plastic member provided with concentric corrugations, and each of said radial slits cutting through at least two of said corrugations.

2. A vacuum cleaner filter bag as in claim 1, said valve collar having a raised rim which encompasses said securing portion thereof.

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