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VACUUM CLEANER CLOTH BAG

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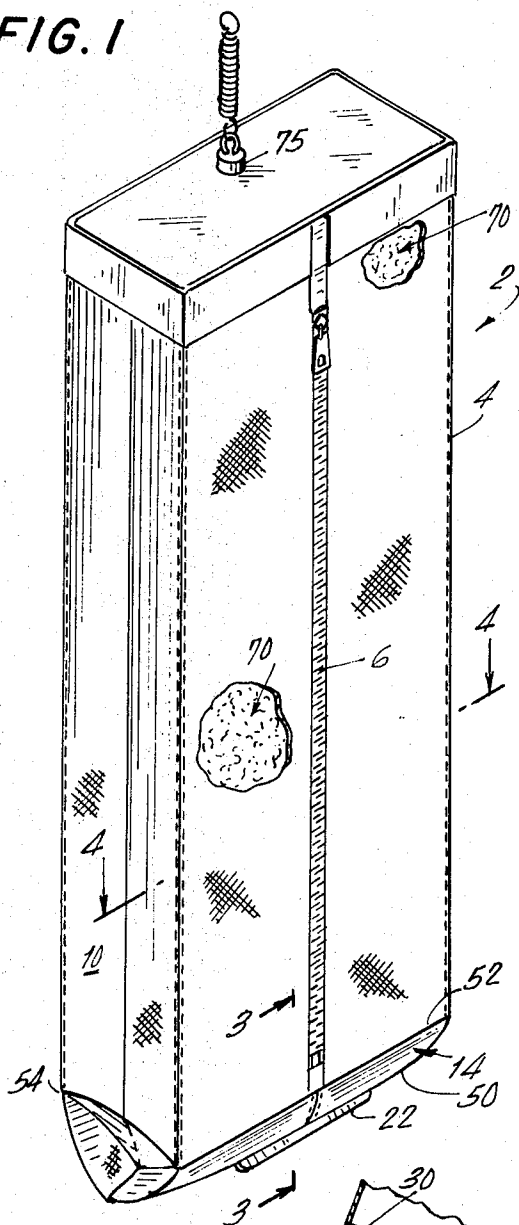
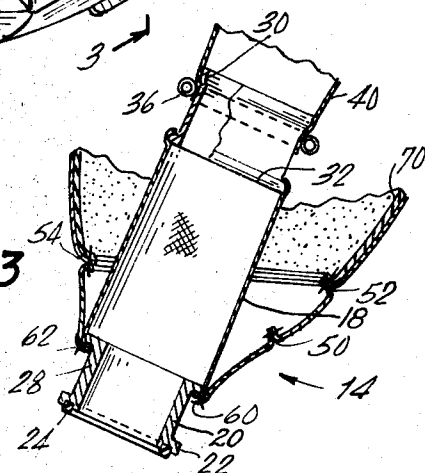
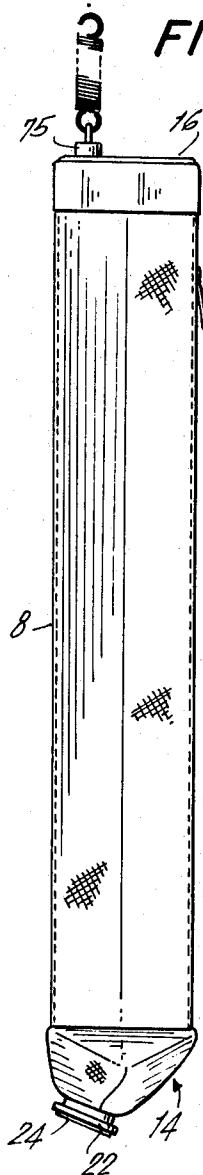
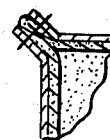
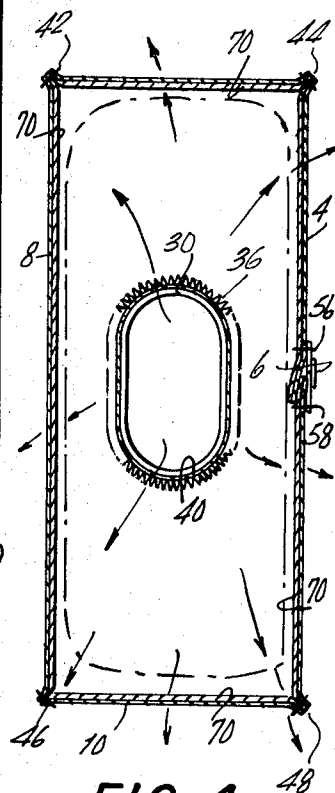


FIG. 4

INVENTORS
SOL HOWARD
ROBERT SCHAAF

BY

Friedman & Goodman
ATTORNEYS

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VACUUM CLEANER CLOTH BAG

Sol Howard and Robert Schaaf, Brooklyn, N.Y., assignors to Mil-An Mfg. Corp., Brooklyn, N.Y., a corporation of New York

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7 Claims

ABSTRACT OF THE DISCLOSURE

A vacuum cleaner cloth bag comprising cloth side walls constructed of an air permeable woven material, a top and bottom and at least one air permeable lamina of non-woven material firmly laminated on the inside of said bag to said side walls.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to vacuum cleaner filter bags. More particularly, this invention relates to vacuum cleaner filter bags of the cloth type which are used to house disposable paper vacuum cleaner filter bags especially to cloth vacuum cleaner bags used in heavy duty operations.

Discussion of the prior art

Vacuum cleaner filter bags constructed of air permeable woven materials have been used for many years. With the development of different types of vacuum cleaners to meet heavy duty requirements there developed a cloth vacuum cleaner bag which housed a disposable type vacuum cleaner bag. Unfortunately the cloth bags were not self-supporting and tended to take any conformation visited upon them by the application of any force. This became undesirable because the operator had difficulty with the cloth bag when it became time to remove the inside disposable bag and insert into the cloth bag a fresh disposable bag. It thus became desirable to provide a bag which while being air permeable tended to keep its shape and not to collapse.

It also became desirable to provide the cloth bag with increased dust and dirt filtration media to insure that no dust or dirt would escape to the atmosphere. One reason for this is that sometimes the operator would let the disposable bag become too full. Thus, dirt and dust tended to become deposited on the floor of the cloth bag. Thus, when the vacuuming operation was once again started only one layer of filtration medium, i.e. the woven material, could be relied upon to prevent escape of the previously collected dust and dirt. Since there are periodic openings in woven materials, it became desirable to provide the additional filtration media.

SUMMARY OF THE INVENTION

It is an object of this invention, therefore, to provide a cloth type vacuum cleaner filter bag which tends to be self-supporting.

It is another object of this invention, therefore, to provide such a cloth type vacuum cleaner filter bag having an additional filtration medium devoid of periodic openings.

These and other objects and advantages will become apparent from the following description, accompanying drawings, and appended claims.

STATEMENT OF THE INVENTION

Broadly, this invention contemplates a vacuum cleaner cloth filter bag comprising cloth side walls constructed of an air permeable woven material, a top and bottom and at least one air permeable lamina of non-woven material

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firmly laminated on the inside of said bag to said side walls.

In a particularly desirable embodiment, the invention contemplates such a vacuum cleaner cloth filter bag where- in there are a plurality of thin layers of non-woven mats laminated to said side walls, said mats comprising short staple fibers of the material of said woven material.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more readily understood and appreciated when reference is made to the accompanying drawings, in which:

FIG. 1 is a perspective view partially broken away of the cloth vacuum cleaner filter bag of the present invention;

FIG. 2 is a side elevation of the cloth bag of FIG. 1;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a sectional view taken along the line 4—4 of FIG. 1; and

FIG. 5 is a detail of a portion of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention is illustrated in the accompanying drawings, in which the bag is given reference numeral 2. It comprises a front 4 with a zipper 6, a back 8, gusseted sides 10 and 12, bottom 14 and top 16. The bottom 14 which partially houses a connecting fabric sleeve 18 is also gusseted as seen in FIG. 1, whereas top 16 is flat. Into bottom 14 is fitted a dust orifice 20 in the form of a generally circular pipe having an outward U-shaped ridge 22 within which sits a circular band 24 of soft resilient material, e.g. low density urethane foam. The orifice 20 terminates in a flanged periphery 28 over which there is affixed the woven cloth bottom members 14. The dust orifice 20, suitably constructed of a durable plastic material, is affixed to the fabric sleeve 18 which extends further into the cloth bag and terminates over a second dirt orifice having a flanged periphery 30 on its end farthest from the bag bottom 14 and having a rounded end 32 at its junction with fabric sleeve 18. The paper bag is inserted over the flanged periphery 30 and a circular coil spring 36 is inserted into overlying position as shown in FIG. 3 to secure the paper disposable vacuum cleaner bag 40 to the cloth bag for the vacuuming operation.

The bag, as indicated above, is constructed of woven material on its sides and joined at points 42, 44, 46, 48, 50, 52 and 54 with similar woven cloth members by stitching. The zipper 6 is joined to front 4 at points 56 and 58 and the bottom sleeve is joined to the dust orifice 20 at points 60 and 62. As seen in FIGS. 3, 4 and 5, to this woven material on the inside of the bag side walls there is laminated a layer of bonded material 70. This bonded material or lamina is bonded to the woven fabric before the bag is constructed but, if desired, could be bonded or secured to the inside side walls of the bag after the bag is made. The material 70 is in the form of at least one layer of non-woven fibers preferably of short staple length. In one embodiment, a plurality of laminae each of which consists of a mat of non-woven fibers is laminated to the side walls and the laminae are thicker than the side walls themselves.

The laminating can be done by use of an adhesive or by a heat fusing operation especially where the fibers comprising the non-woven mat lamina are of the same composition as the fibers comprising the woven side walls themselves. For instance, where the woven bag comprises continuous fibers of a synthetic thermoplastic material, e.g. nylon 6 or nylon 6/6, a non-woven mat of staple lengths of the thermoplastic material can be conveniently

laminated or bonded to the woven layer by placing the non-woven mat over the woven layer and applying heat and pressure. The combination of heat and pressure will normally be sufficient to slightly plasticize the fibers and unite the same firmly together.

Instead of laminating similar types of fibers together it is contemplated within the present invention to construct the woven side walls of a natural fiber and laminate thereto at least one lamina of synthetic material. Alternatively, the side walls can be woven with a synthetic fiber and the non-woven mat can comprise staple lengths of naturally occurring fibers. In any case, it is preferred that the fibers forming the non-woven mat be strong so as to rigidify the side walls to give support to the bag structure.

By providing at least one non-woven mat lamina bonded to the woven sides of the bag, the bag tends to retain its shape. Thus it can be said that the additional filter medium serves not only to prevent dust and debris from passing through to the cloth side walls of the vacuum cleaner cloth bag and possibly through to the atmosphere but imparts to the bag firmer side walls which enable the operator to remove disposable bags more readily.

As seen in FIG. 4 and in the detail view of FIG. 5, the bag is formed so that the bonded material 70 forms a rectangle. The bonded material is laminated to the woven fabric in the corners between the respective sides where the stitching secures one side to another. It should be noted that in the embodiment shown the bonded lamina is continuous around the bag beginning at one side of the zipper 6 and extending into the four corners where it is bent into an inverted U-shape and sandwiched between sides to be stitched together. The lamina extends around the bag until it comes to the other side of zipper 6.

To the top 16 of bag 2 is affixed a spring mounting platform 75 to which is normally attached a coil spring 77 the other end of which is attached to the vacuum cleaner itself.

From the above it is apparent that this new vacuum cleaner filter bag solves the problem attendant with prior art bags. The bag is more durable during operation, more readily holds its shape and filters more effectively due to provision of non-woven mats which do not have periodic openings but have random openings. When a plurality of non-woven laminae are employed, the dirt filtration is far more effective than heretofore provided.

The terms and expressions used herein have been used for purposes of illustration and not of limitation, as there is no intention, in the use of such terms and expressions, of excluding any equivalents or portions thereof, as many

modifications and departures are possible within the scope of the appended claims.

What is claimed is:

1. A vacuum cleaner cloth bag comprising cloth side walls constructed of an air permeable woven material, a top and a bottom and at least one air permeable lamina of non-woven material firmly laminated on the inside of said bag to said side walls, said non-woven material running continuously along the inside circumference of the walls of said bag, and the sides of said bag being secured together by stitching at the corners at which point said non-woven material is crimped in the form of an inverted U and sandwiched between said woven material comprising the side walls.

2. A vacuum cleaner cloth bag according to claim 1, wherein there are a plurality of thin layers of non-woven mats comprising the laminae laminated to said side walls.

3. A vacuum cleaner cloth bag according to claim 1, wherein said woven material and said non-woven material comprise synthetic fibers.

4. A vacuum cleaner cloth bag according to claim 3, wherein said non-woven material is laminated to said woven material by fusion.

5. A vacuum cleaner cloth bag according to claim 1, wherein said woven material and said non-woven material comprise dissimilar fibers.

6. A vacuum cleaner cloth bag according to claim 1, wherein one side wall is provided with a zipper running down said side wall and said bottom is provided with a dust inlet extending into said cloth bag, said inlet comprising a tubular member the middle portion of which is constructed of a fabric material.

7. A vacuum cleaner cloth bag according to claim 5, wherein there are a plurality of non-woven lamina providing a total thickness greater than that of said woven material.

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DENNIS E. TALBERT, JR., Primary Examiner

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