MOUNTING DISPOSABLE VACUUM CLEANER BAGS, BY MEANS OF RIGID MEMBER WITH SLOTTED CORNERS

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1 Claim. (Cl. 183—51)

This invention relates to cleaning apparatus and, more particularly, to a disposable filter bag for suction type cleaning devices.

Certain types of suction cleaning devices require the use of a disposable filter paper bag that is supported within a compartment of the cleaning device for filtering the stream of pressurized soilied air passing therethrough. These bags are usually provided with an annular frame adjacent to the open end thereof for removably supporting the filter unit within the cleaning apparatus. These annular frames also prevent accidental tearing of the fragile filter paper during the installation and removal, as well as to maintain the shape of the filter bag during use.

In many instances, however, there is a tendency for the bag to pull away from the annular frame when subjected to fluid pressure during use, whereby the useful life is considerably shortened. These types of bags are also difficult to manufacture since it requires a substantial amount of handling and manipulation to properly position the bag with respect to the supporting frame and to adequately secure these parts together. Accordingly, it is an object of the present invention to provide a disposable filter paper bag for vacuum cleaning machines that is extremely simple in construction, efficient in operation, and which will overcome the aforementioned difficulties.

Another object of the present invention is to provide a filter bag having a supporting and shape-retaining frame, which is extremely compact, may be folded into a small package for distribution, and which can be efficiently and easily applied to the vacuum cleaning apparatus without danger of tearing or otherwise damaging the filter paper.

Still another object of the present invention is to provide a novel method of manufacturing filter units for suction type cleaners of this type that will enable the bag to be securely fastened to the supporting flange in proper alignment therewith and able to withstand unusually high pressures during use.

All of the foregoing and still further objects and advantages of this invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings.

Fig. 1 is a side elevational view of a disposable vacuum cleaner filter bag made in accordance with the present invention.

Fig. 2 is a top plan view of the bag shown in Fig. 1, with part of the top plate cut away and with one corner of the bag broken away for clarity.

Fig. 3 is a transverse cross-sectional view of a filter bag made in accordance with the present invention in operative use with vacuum cleaning apparatus.

Fig. 4 is an exploded perspective view of the filter bag illustrated in Fig. 1 to Fig. 3.

Fig. 5 is an enlarged fragmentary elevational view of certain parts of the filter bag.

Fig. 6 is a front elevational view of the filter bag shown in Fig. 1, in a partially collapsed position.

Fig. 7 is a plan view of a modified form of base plate. Referring now more in detail to the drawings, a filter unit 10 made in accordance with the present invention, is shown to include a filter paper bag 12 constructed of a filter paper of the type well known to those skilled in the art. This bag is shown to be of substantially rectangular cross-sectional configuration, so as to provide a plurality of corners 13, and has pleated sides 14 to facilitate the folding and expansion thereof and to obtain maximum capacity during use.

The upper open end of the filter bag 12 is folded outwardly to provide an upper marginal portion 15, as is clearly shown in Fig. 4. In manufacturing the filter unit of the present invention, the main body portion of the filter bag 12 is inserted into the central opening 19 of the base plate 18 so that the annular marginal flange 15 of the paper bag will be supported upon the adjacent surface thereof. Each corner of the central opening 19 of the base plate 18 is provided with a radially outwardly extending slit 21 for receiving each of the corners 13 of the filter bag. These corners are inserted into the slits 21 by exerting a slight bending pressure upon the base plate 18 so as to spread the slit defining portions of the base plate apart. After the corners 13 have been urged into the slits, a release of the bending force upon the base plate will bring the slit defining portions back together again, thereby frictionally clamping each of the corners 13 in place.

If desired, an adhesive of one type or another may be applied to the marginal flange 15 to further secure it to the base plate 18 in order to increase the strength thereof and provide an air-tight seal. However, a cover plate 25 having a central opening 26 is secured in overlying relationship with the marginal flange 15 to the adjacent surface of the base plate 18 to further firmly clamp or sandwich the marginal flange 15 between the base and cover plates, as is more clearly shown in Fig. 2 of the drawing.

In Fig. 6 of the drawing, the filter unit 10 is shown in partly collapsed position to illustrate the manner in which such units can be packed for shipment, display, and storage purposes, whereby a minimum amount of space is required. When it is desired to insert the filter unit into a suction cleaning device for use, such as shown in Fig. 3, it is only necessary to support the integral base and cover plates 18, 25, upon the support plate or flange of the cleaner unit 29 with the main body portion of the bag within the provided compartment 28. The soiled air will then be delivered to the open end of the filter unit and the filtered air will be permitted to pass outwardly from the compartment 25 through the opening 30 in the bottom thereof. Because of the firm engagement of the marginal flange 15 between the respective base and cover plates, the filter unit is able to withstand substantially large vacuum and pressure forces without tearing even after the bag has been filled to capacity.

While the filter unit and all of the associated parts have been shown and described as being of rectangular configuration, it will be recognized that such can be provided in virtually any shape, such as triangular, oval, or the like, so long as a sufficient number of peripherally spaced apart slits such as those 21 described are provided for frictionally securing corner or other gathered portions of the filter bag material in place. In Fig. 7, for example, the opening 19a in base plate 18a is shown in hexagonal form with slits 21a extending inwardly at the corners formed at the junction of adjacent sides of the hexagon. Likewise, such filter paper bag can be provided with additional pleats or bellows, or the like, to further increase its capacity or provide a more suitable shape for a specific type of cleaner.

While this invention has been described with particular reference to the construction shown in the drawing, it is
to be understood that such is not to be construed as imposing limitations upon the invention, which is best described by the claims appended hereto.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A filter unit for suction type cleaners, comprising in combination, a paper filter bag that is substantially rectangular in cross section forming longitudinal corner edges at the juncture of the adjacent sides thereof, the bag being open at one end, a marginal flange extending outwardly from the sides of the bag at the open end thereof, a rectangular shaped base plate having a rectilinear opening of smaller area than the cross sectional area of the bag and through which opening the bag is disposed, the corners of the opening in the base plate being provided with diagonally extending slits, the adjacent edges of each of the slits being normally disposed in contact with each other, the respective corner edge portions of the bag adjacent the open end of the latter being clampingly secured within the respective slits in the base plate, the marginal flange of the bag overlying the face of the base plate and secured thereto, and a cover plate formed with a rectilinear opening registering with the open end of the bag and with the opening in the base plate and being secured to the face of the marginal flange on the bag and to the base plate.

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