

Sept. 20, 1966

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3,273,322

DISPOSABLE VACUUM CLEANER BAG

Filed Dec. 4, 1962

2 Sheets-Sheet 1

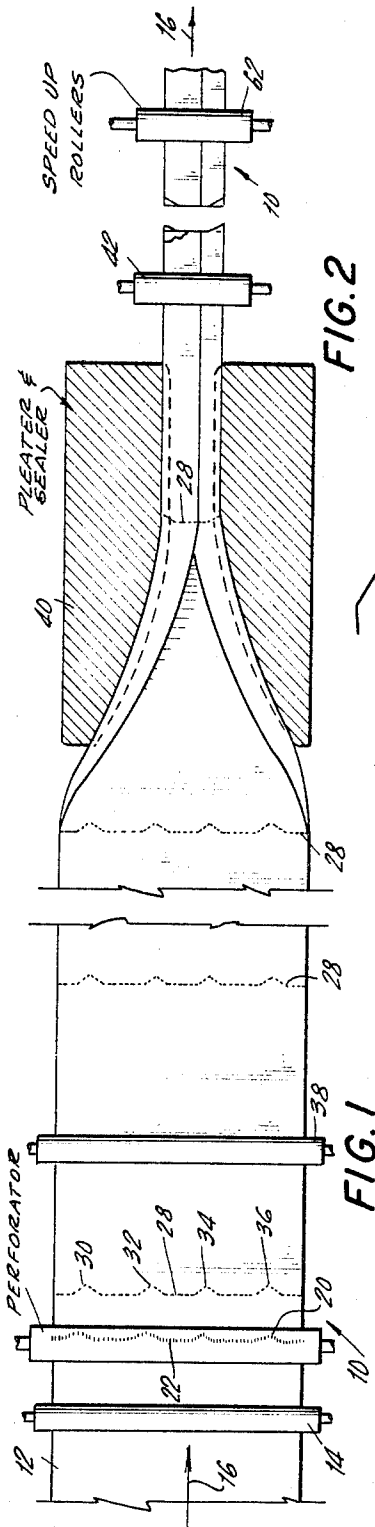


FIG. 2

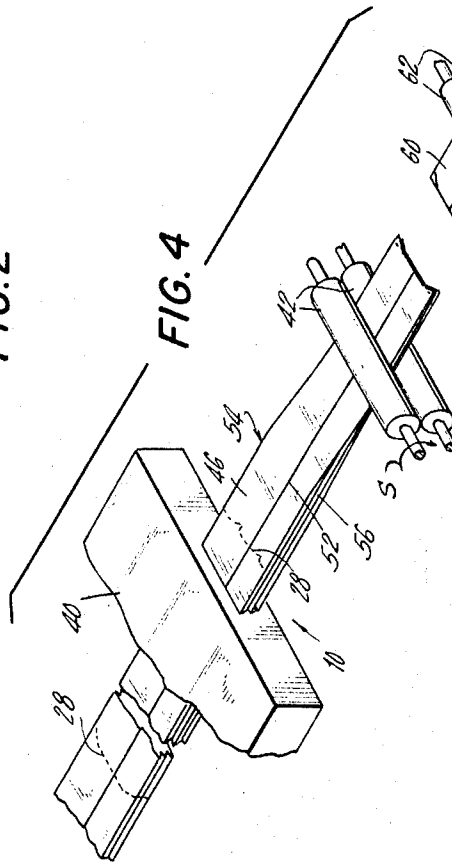
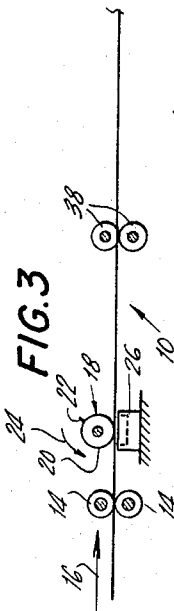
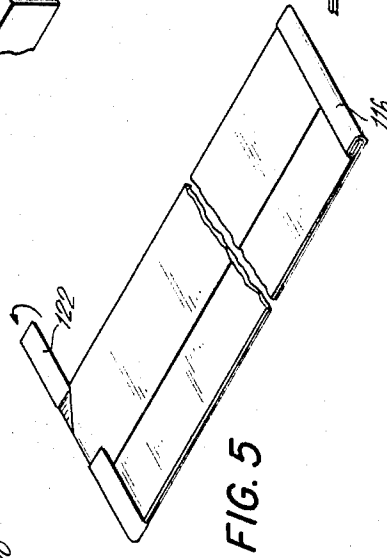
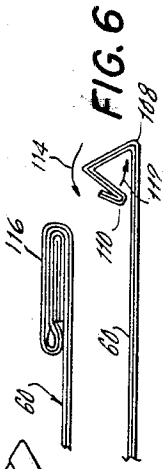


FIG. 7



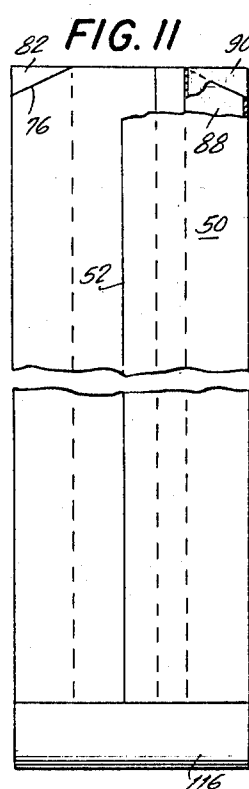
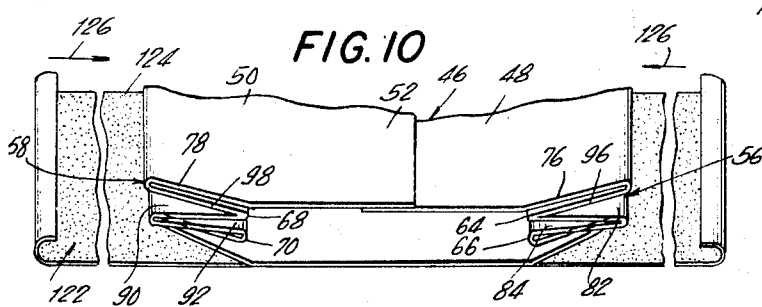
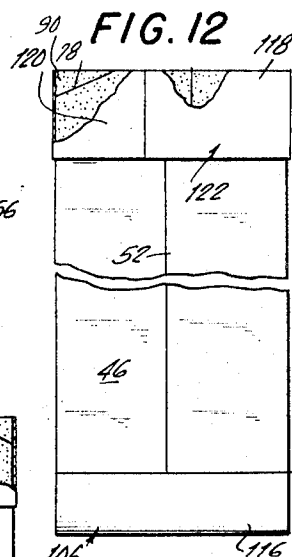
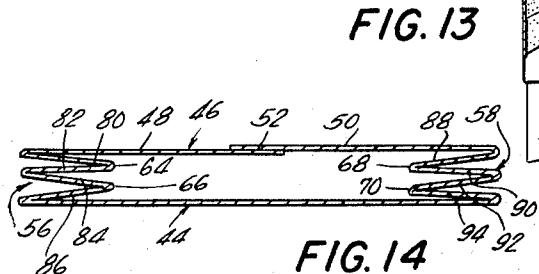
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DISPOSABLE VACUUM CLEANER BAG

2 Sheets-Sheet 2



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3,273,322

DISPOSABLE VACUUM CLEANER BAG
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Company, Inc., a corporation of New York
Filed Dec. 4, 1962, Ser. No. 242,164
1 Claim. (Cl. 55—376)

The present invention relates to bags of the type used in vacuum cleaners and particularly to disposable bags of the type which may be readily removed from the vacuum cleaner when full and replaced by another similar bag.

The disposable bags of the type to which the present invention relates are preferably formed of a suitable air pervious paper sheet material having a closed end and an open end. The open end is intended to receive an air nozzle within the vacuum cleaner so that the dust-laden air drawn into the vacuum cleaner can pass through the air pervious bag and deposit the dust in the bag. A serious disadvantage of prior art bags of the type to which the present invention relates resides in the fact that said bags did not have a substantially airtight fit upon the air nozzle with the result that the bags often slipped from the nozzle during use of the vacuum cleaner or allowed for the escape of the dust within the vacuum cleaner outwardly from the end of the bag in which the air nozzle is received.

In view of the foregoing, it is an object of the present invention to overcome the disadvantages of prior art disposable vacuum cleaner bags.

It is another object of the present invention to provide a bag of the described type which is provided with a highly superior collar construction so as to provide for a substantially good and tight fit upon the air nozzle of the vacuum cleaner at the output end of the vacuum cleaner air hose so as to obviate and prevent the serious disadvantages resulting from the utilization of prior art vacuum cleaner bags.

It is another object of the present invention to provide a highly efficient disposable vacuum cleaner bag of the described type which can be manufactured and sold at a relatively low price.

It is a further object of the present invention to provide a highly novel collar construction for a disposable paper vacuum cleaner bag utilized to collect the dust drawn into the vacuum cleaner.

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

In the drawings, which illustrate the best mode presently contemplated for carrying out the invention:

FIGURE 1 is a more or less diagrammatic illustration of an apparatus for forming vacuum cleaner bags pursuant to the present invention;

FIGURE 2 is a view similar to FIGURE 1 and illustrates another portion of the machine which forms the disposable bags;

FIGURE 3 illustrates a side elevation of the machine or apparatus shown in FIGURE 1;

FIGURE 4 is a perspective view of the portion of the machine illustrated in FIGURE 2;

FIGURE 5 is a perspective view of a disposable paper bag pursuant to the present invention with a portion of the collar being illustrated in unsealed condition for purposes of illustration;

FIGURE 6 is a view illustrating the formation of the closed end of the disposable bag;

FIGURE 7 is a view illustrating the closed end of the paper bag, the closed end being illustrated on a larger scale than that utilized in FIGURE 5;

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FIGURE 8 illustrates a pleated blank in folded condition for formation into a bag pursuant to the present invention;

FIGURE 9 illustrates an end view of FIGURE 8 taken on the line 9—9 of FIGURE 8;

FIGURE 10 is a fragmentary view on an enlarged scale and illustrates an intermediate condition of the bag in the formation of the collar thereon;

FIGURE 11 is a view similar to FIGURE 8 showing the bag formed with the lower closed end thereon prior to the application or formation of the collar thereon, a portion thereof being broken away for purposes of illustration;

FIGURE 12 illustrates a completed bag pursuant to the present invention with portions thereof broken away for purposes of illustration;

FIGURE 13 is a fragmentary view similar to FIGURE 12 and illustrates the side of the bag opposite the side thereof shown in FIGURE 12; and

FIGURE 14 is a sectional view taken on the line 14—14 of FIGURE 8.

Referring now to FIGURES 1—4 of the drawing in detail, there is shown a bag forming machine 10 pursuant to the present invention. A roll 12 of suitable sheet material is withdrawn from a supply thereof (not illustrated) and fed to the machine 10. The sheet material 12 is preferably a suitable air pervious paper material. A pair of feed rollers 14 are utilized to draw the sheet material 12 from a supply thereof in the direction of the arrow 16, the sheet material being threaded through the feed rollers 14. From the feed rollers 14 the sheet material 12 passes through a conventional perforator device 18 which, as here shown, comprises a perforator roller 20 which is provided with a conventional perforator 22 and rotates in the direction of the arrow 24 relative to a suitable anvil 26. The perforator device 18 serves to perforate the sheet material 12 transversely thereof as by the line of perforations 28. As best shown in FIGURE 1, the line of perforations 28 includes the perforated peak portions 30, 32, 34 and 36 which are laterally spaced transversely of the sheet material 12. From the perforator device 18 the sheet material 12 passes through the companion rollers 38. From the rollers 38, the perforated sheet material 12 passes through a conventional pleating device 40 in which the perforated sheet material is folded upon itself and provided with longitudinally extending pleats as hereinafter described in detail. The folded and pleated sheet material is drawn or fed through the pleater device 40 by means of the rollers 42. It will also be understood that the pleater device 40 serves to seal the sheet material in the tubular condition thereof as best shown in FIGURE 4. It will be noted from FIGURE 4 that as the sheet material leaves the pleater and sealing means 40, it is essentially an elongated tubular element having the opposing side walls 44 and 46 as best shown for example in FIGURE 13. The wall 46 is constituted by the cooperating wall portions 48 and 50, the portion 50 overlying the portion 48 and being sealed thereto as at 52. The opposing end walls of the elongated tubular means 54 which leaves the pleater and sealing means 40 is also provided with the opposing pleated end walls 56 and 58 as best shown in FIGURE 13. It will also be noted, as best shown in FIGURE 4, that the elongated tube 54 is provided with the perforations 28 at spaced intervals longitudinally thereof due to the operation of the previously mentioned perforator means 18. Provision is made to separate the elongated tube 54 along the perforations 28 thereof in order to form the bag forming blanks 60. This function is accomplished by the cooperating speed-up rollers 62. As best shown in FIGURES 2 and 4, the speed-up rollers 62 are spaced from the feed or drive rollers 42 in the direction of movement

of the tubular member 54 as it leaves the pleater and sealing means 40 as indicated by the arrow 16. The speed-up rollers 62 are driven at a rate of rotation which exceeds the rate of rotation of the feed rollers 42 with the result that a pressure or tension in the direction of the arrow 16 is applied to the portion of the elongated tubular element 54 which has already passed through the drive or feed rollers 42. As will be readily apparent, the increased tension resulting from said operation of the speed-up rollers 62 is sufficient to tear the free end of the tubular member 54 which projects beyond the rollers 42 along the perforation 28 which has passed beyond or through the rollers 42 so as to tear from said free end of the tube 54 a tube blank 60 as illustrated in FIGURE 4 which shows a tube blank 60 passing through the speed-up rollers 62 and torn from the free end of the elongated tube 54 formed of the paper sheet material. It will be noted that the end wall 56 is defined by the pair of inwardly directed pleats 64 and 66 and similarly the end wall 58 is defined by a pair of inwardly directed pleats 68 and 70.

As previously indicated, the lines of perforations 28 are each provided with peaked portions 30, 32, 34 and 36 and with straight portions which interconnect the peaked portions. This results in the formation of complementary end conformations at each of the upper and lower ends 72 and 74 of the blank 60 as best shown in FIGURES 8 and 9. In this connection, it will be noted that each of the wall portions 48 and 50 of the wall 46 is provided at the upper end thereof with an oblique marginal edge portion, the marginal edge portion for the wall portion 48 being indicated by the reference numeral 76 and the oblique marginal edge portion for the wall portion 50 being indicated by the reference numeral 78. The inwardly directed pleat 64 is defined by the elongated integral end panels 80 and 82, the elongated integral end panels 84 and 86 define the inwardly directed pleat 66, the elongated integral end panels 88 and 90 define the inwardly directed pleat 68 and the integral elongated end panels 92 and 94 define the inwardly extending pleat 70. The end wall panel 80 which underlies the side wall portion 48 is provided also with an oblique marginal upper end portion which is indicated by the reference numeral 96 and is similar to the adjacent marginal edge 76 at the upper end of the side wall panel 48. Similarly, the end wall panel 88 which underlies the side wall portion 50 is provided at the upper end thereof with an oblique marginal edge 98 which is similar to the adjacent oblique marginal edge 78. It will be noted from FIGURE 9 that the cooperating oblique marginal edges 78 and 98 define a notch 100 which reveals the upper end portion of the end panel 90. In the same manner a notch 102 is defined between the end wall panel 94 and the side wall 44 so as to reveal the upper end of the end wall panel 92. It will be understood that the end wall 56 is similarly provided with a pair of notches 104 of which one is shown in FIGURE 8 so as to reveal the end wall panels 82 and 84 at the upper end portions thereof. Consequently, it will be apparent that in the folded condition of the bag forming blank 60 as illustrated in FIGURE 8 the upper ends of the intermediate end wall portions or panels 82 and 84 project beyond the outer end wall panels 80 and 86 and similarly the upper ends of the intermediate end wall panels 90 and 92 project beyond the upper ends of the outer end wall panels 88 and 90 for a purpose which will hereinafter be described in detail. The previously referred to peaks 30, 32, 34 and 36 in the line of perforations 28 define the similarly numbered peaks in the bag forming blank 60.

In forming the completed bag 106, as best shown in FIGURE 12, the lower end 74 of the bag is closed by folding the lower end upon itself along a transverse fold line 108. Outwardly of the fold line 108 the end portion is folded also along a fold line 110. The fold line 110

is moved inwardly so as to abut the fold line 108 as indicated by the arrow 112. The portions are then folded upon each other as indicated by the arrow 114 and are sealed together in said double folded arrangement as best shown in FIGURE 7 to form the closed sealed air tight lower end 116.

In addition to the closed lower end 116, the bag 106 of the present invention is provided with an open upper end 118 which has provision for a snug fit upon the output or exhaust end of the air hose within the vacuum cleaner. For this purpose, provision is made for a collar 120. The collar is defined by a strip of suitable sheet material preferably air impervious paper, said strip being indicated by the reference numeral 122. The strip 122 is provided with a suitable adhesive 124 at one surface thereof. In order to form the collar 120, the strip 122 is wrapped about the open upper end 72 of the bag forming blank 60 as indicated by the arrows 126 in FIGURE 10. In the process of wrapping or folding the strip 122 about the open upper end of the bag forming blank 60, the adhesive surface 124 is securely adhered to the bag forming blank. More specifically, the adhesive surface is secured to the opposing side walls 44 and 46 of the blank and due to the previously mentioned notches 100, 102 and 104, which provide for the extension of the upper end portions of side wall panels 82 and 84 and 90 and 92 beyond the oblique upper marginal edge portions of the side walls, as previously indicated, the collar 120 is secured also to one of the panels which defines each of the inwardly directed pleats 64, 66, 68 and 70 at the upper ends of said pleats. Consequently, it will therefore be readily understood that the collar 120 serves to form an opening at the upper end of the bag to provide a snug fit on the air hose of the vacuum cleaner, the collar serving in addition to reinforce the bag 106 at the upper end thereof and moreover it will be readily apparent that the collar also serves to retain the pleats in the pleated conformation thereof at the upper end of the bag 106. It will also be readily apparent that the closed end 116 at the bottom of the bag serves to secure the pleat in the pleated conformation thereof at the bottom of the bag. As a result, when the flow of air through the bag 106 is discontinued, the expanded end walls of the bag 106 tend to return to their original pleated condition.

From the foregoing, it will be apparent that there has been illustrated and described a highly novel and efficient expendable or disposable bag for a vacuum cleaner or the like which has the advantages of a reinforced open end collar opening which provides for a snug fit on the outlet end of the air hose of a vacuum cleaner and in addition serves to retain the pleated side walls of the bag in their original pleated conformation.

While there has been illustrated and described the presently preferred embodiment of the present invention, it will be understood that various changes and modifications may be made therein without however departing from the basic inventive concept thereof, as set forth in the appended claim.

I claim:

An expendable vacuum cleaner bag formed of a substantially rectangular blank of air pervious sheet material, said blank having portions which define the opposing side walls of said bag and axially pleated portions which define opposing pleated end walls of said bag, said blank having notches defined at the upper marginal end thereof for projecting upper end portions of said pleated portions beyond adjacent marginal end portions of said side walls, an air impervious closure provided at the bottom of said bag, and a collar provided at the upper end of said bag, said collar being secured to said opposing side walls and to said projecting portions of said pleated portions, said notches being provided at the four junctures of said side and end walls, each end wall having a pair of in-

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wardly directed pleats and each notch being defined between one pleat and the adjacent side wall, each pleat of said pair of inwardly directed pleats being defined by a first one of said axial pleat end wall portions and a second one of said axial pleat end wall portions, each second axial pleat end wall portion being normally folded against an adjacent side wall portion, each notch being defined by an oblique cut at the upper marginal edge of each second axial pleat and its associated side wall portion so as to disclose at each said juncture above each side wall an upper end surface portion of each first one of said axial pleat end wall portions, and said collar encompassing the upper marginal end of said bag and being adhesively secured to each of said side walls and to said disclosed upper end surface portions of each first one of said axial pleat end wall portions.

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