

June 9, 1953

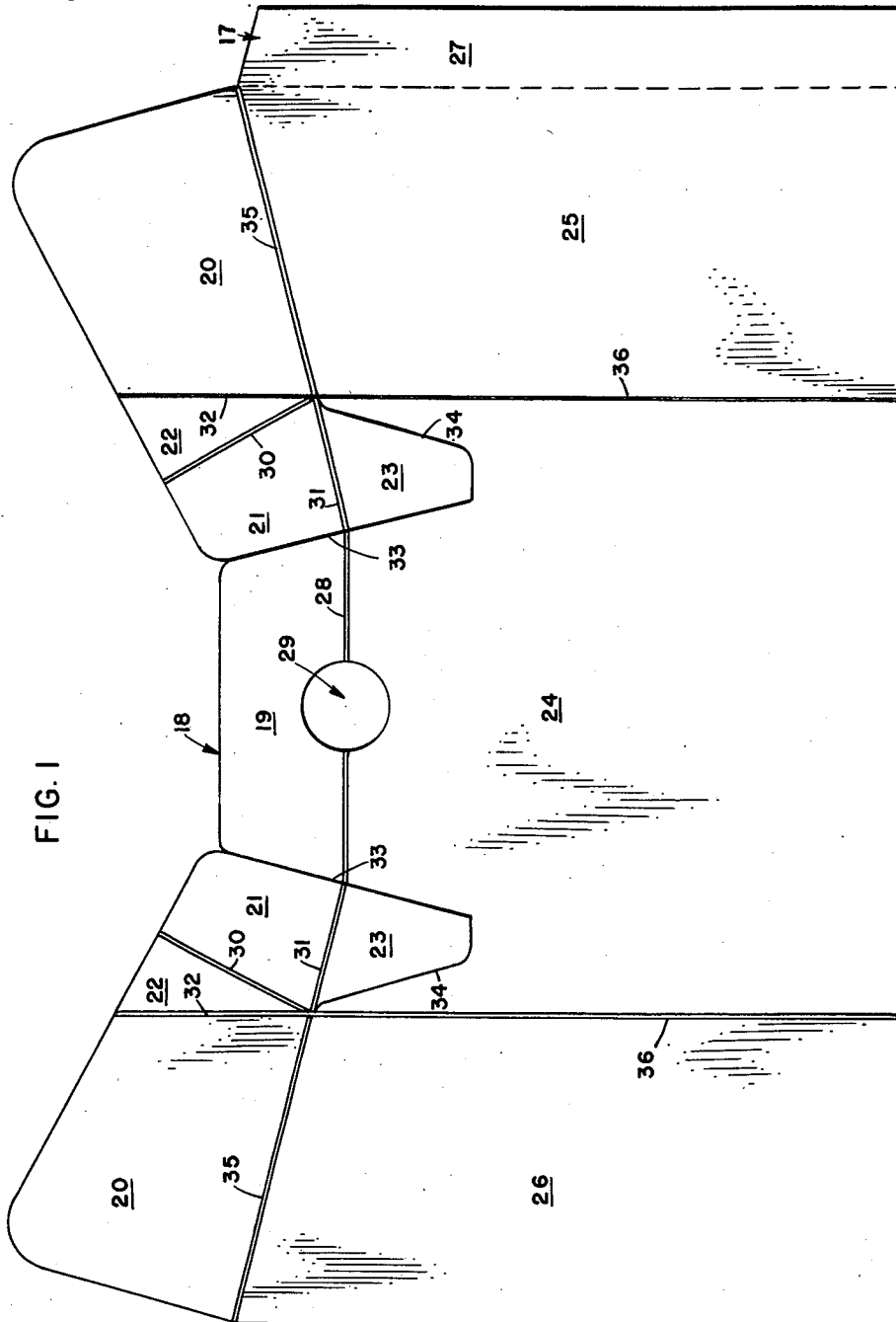
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2,641,333

SUCTION CLEANER

Filed April 18, 1951

6 Sheets-Sheet 1



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2,641,333

SUCTION CLEANER

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6 Sheets-Sheet 2

FIG. 2

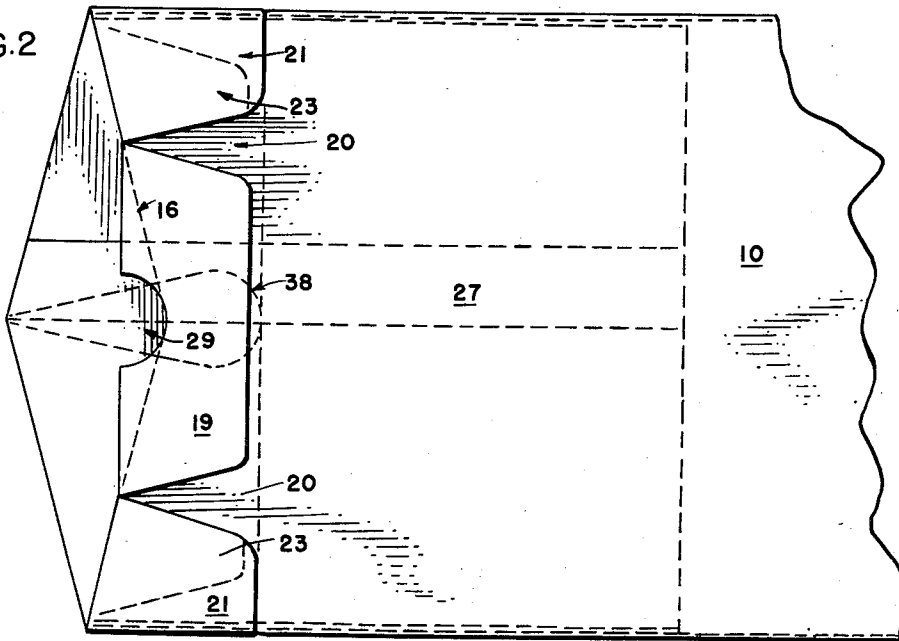
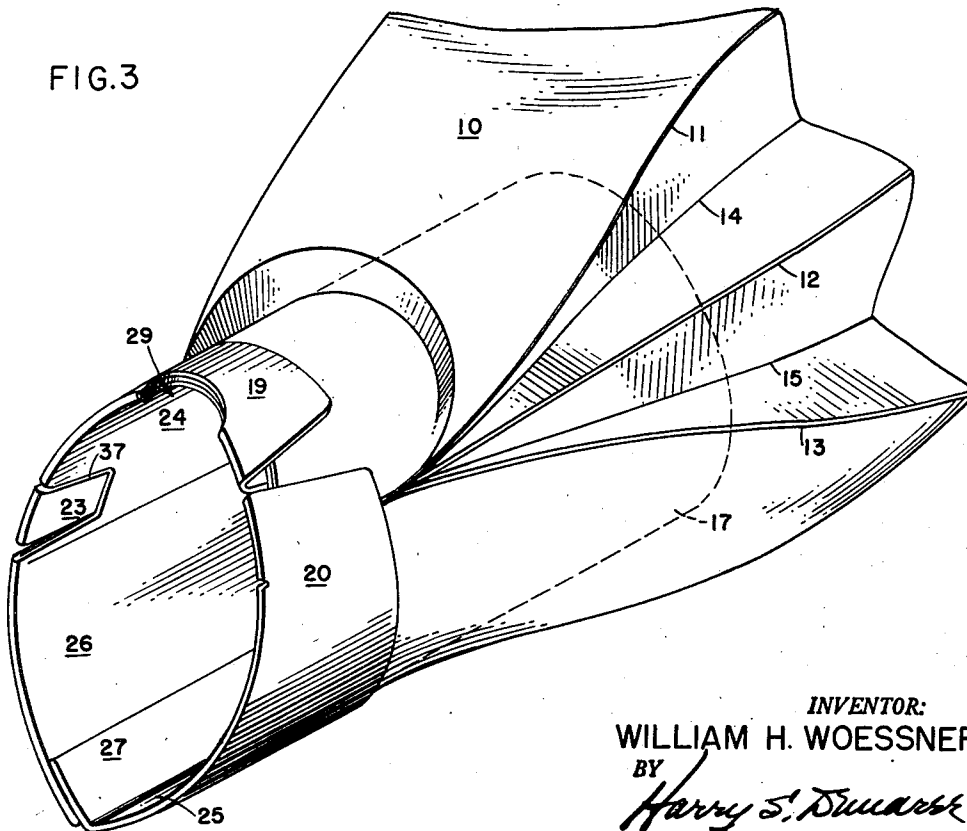


FIG. 3



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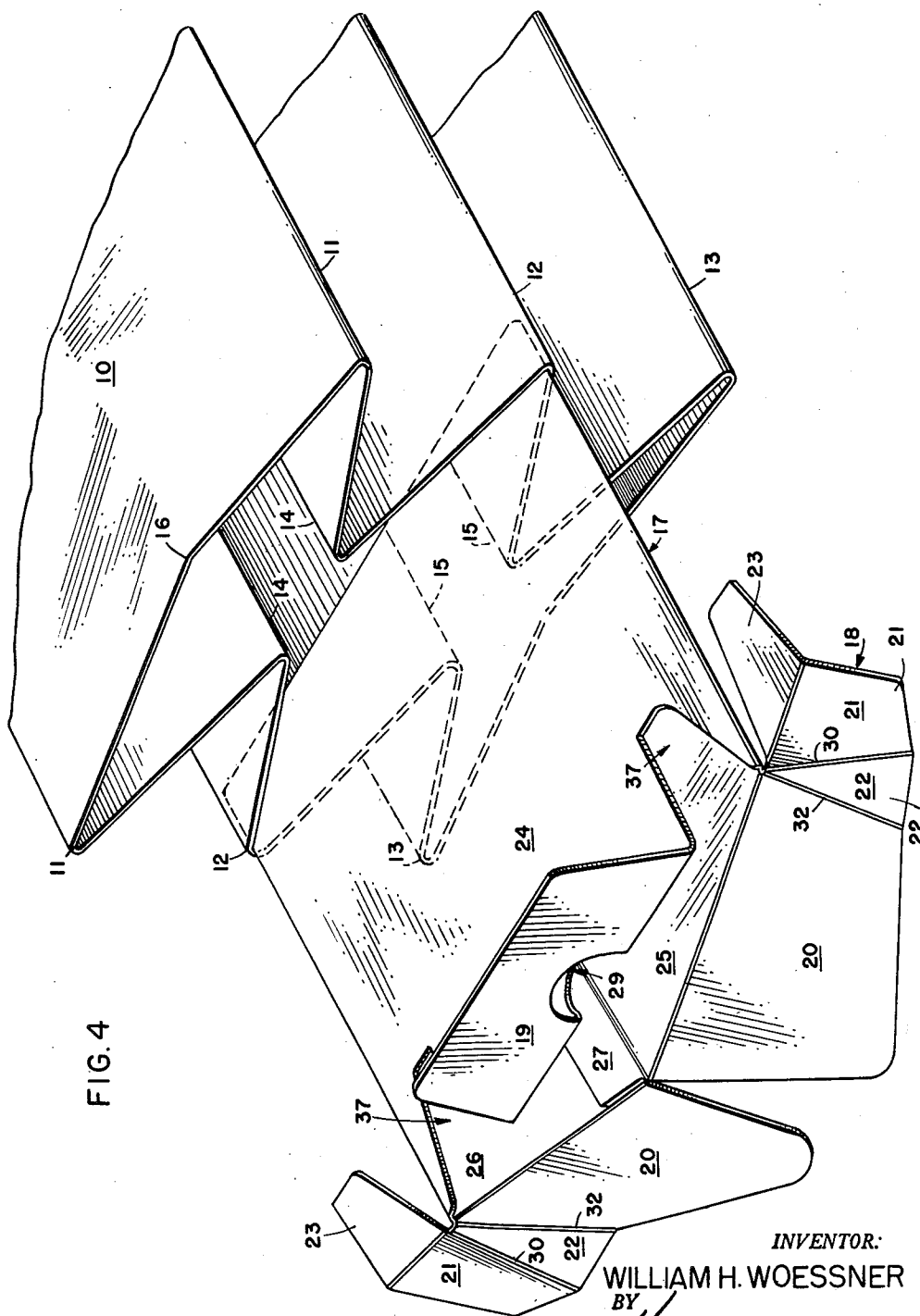
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6 Sheets-Sheet 3



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6 Sheets-Sheet 4

FIG. 5

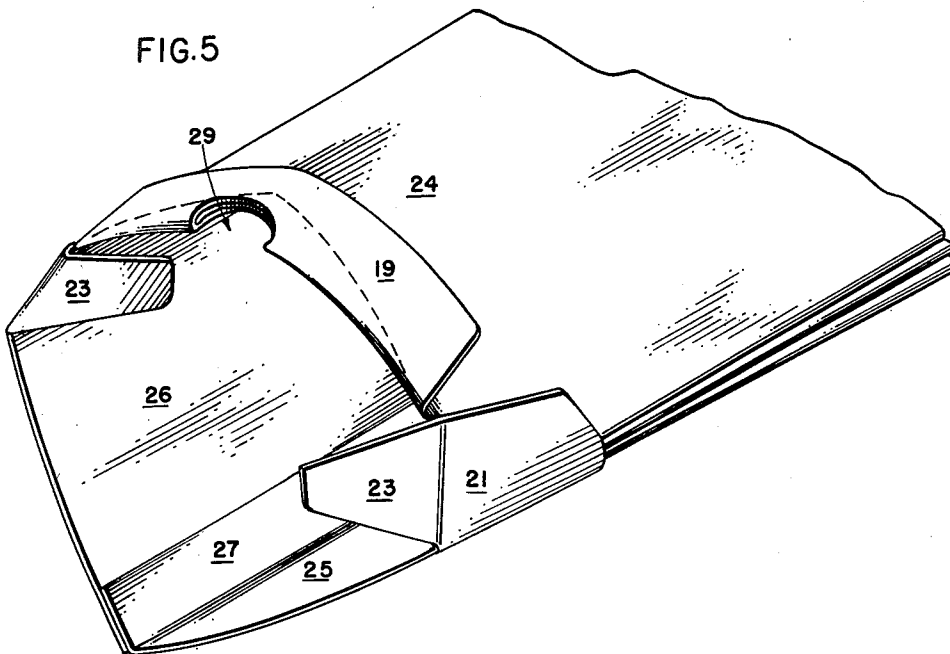
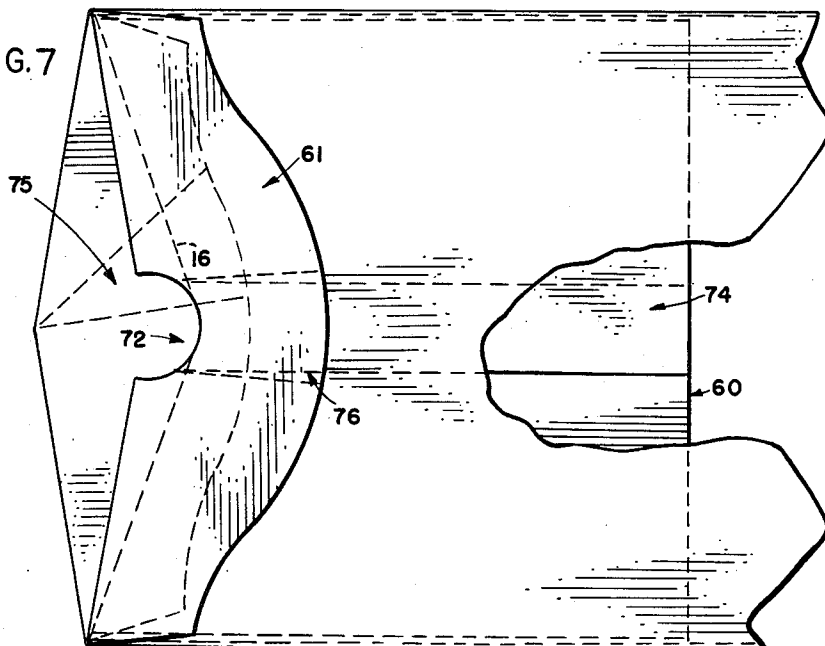


FIG. 7



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2,641,333

SUCTION CLEANER

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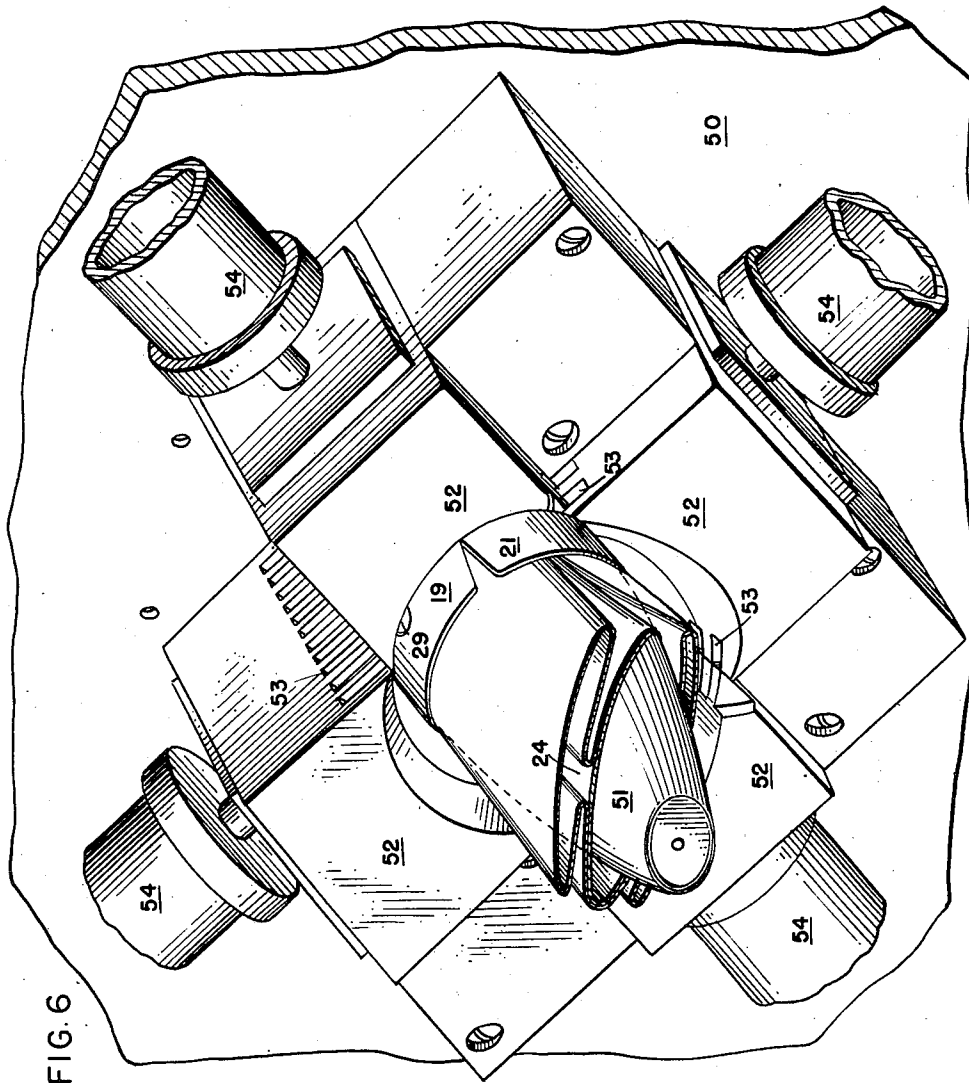


FIG. 6

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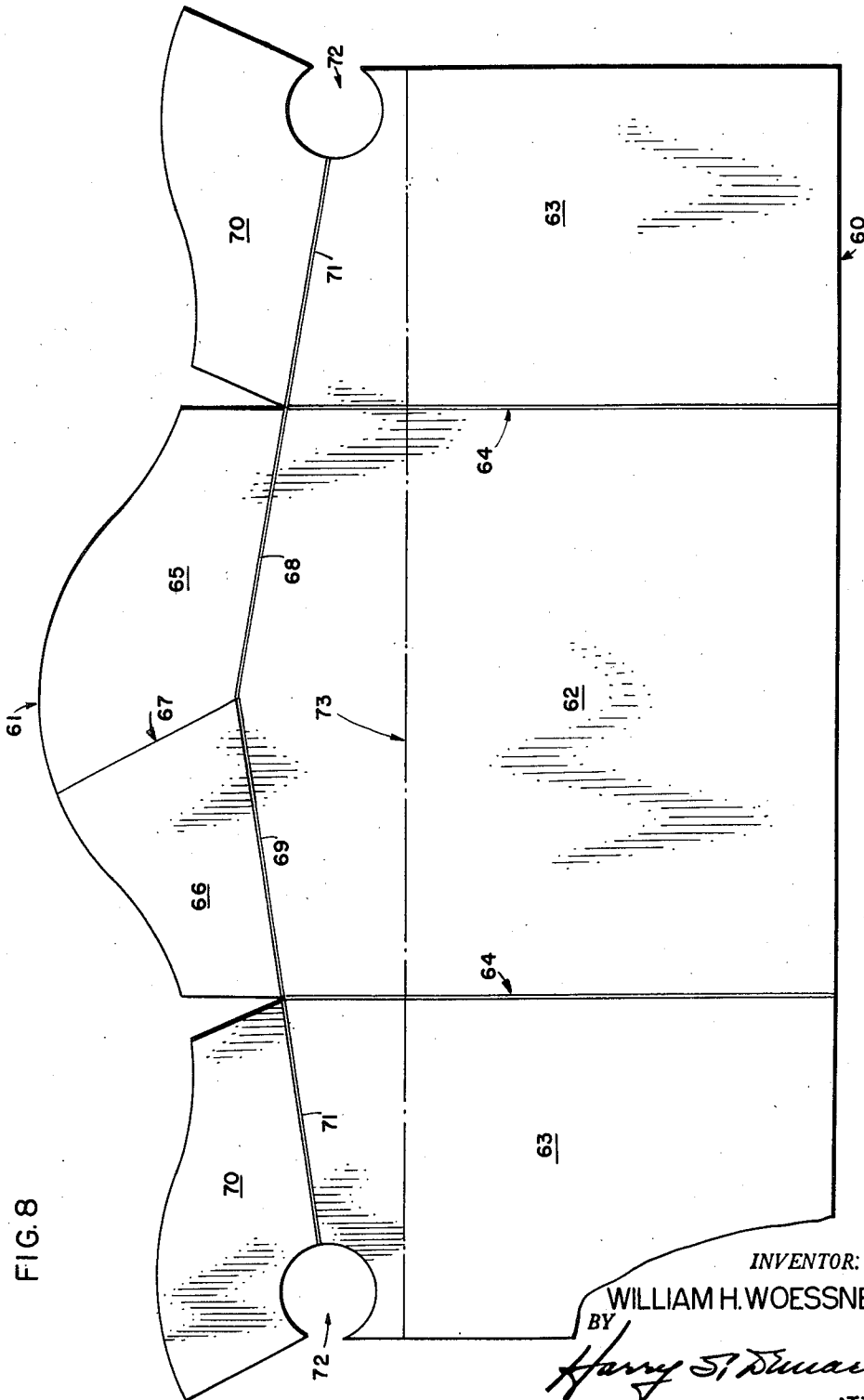
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SUCTION CLEANER

Filed April 18, 1951

6 Sheets-Sheet 6



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2,641,333

SUCTION CLEANER

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Application April 18, 1951, Serial No. 221,666

24 Claims. (Cl. 183-51)

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The present invention relates to suction cleaners and more particularly to a filter bag therefor and to the method of making the same.

Specifically, the invention relates to inexpensive, porous paper filter bags which are intended to be discarded and replaced by new ones after becoming soiled by use. The filter bags of the present invention are for attachment to the exhaust nozzle of an upright type cleaner and are intended to be protected by an air pervious cloth bag which does not act as a filter but merely permits passage of clean air filtered by the encased porous paper filter bag.

The porous paper bag to which the invention relates, when expanded, is of large diameter over the major portion of its length to provide a large filtering area. At its lower end, however, it must fit closely about the exhaust nozzle of a suction cleaner which has a comparatively smaller diameter.

For that reason the bag is provided with inwardly extending accordion-like folds or pleats over its entire length and may be formed in a well known bag-making machine. The diameter of the open lower open end of the bag with certain folds turned inwardly and sealed, is substantially the same as that of the exhaust nozzle of the cleaner to which it is to be attached.

The lower open end of the porous paper bag must be clamped to the exhaust nozzle of a suction cleaner, and in order to prevent failure when expanded, the lower folded end of the bag should be reinforced and properly positioned peripherally.

It is also necessary to provide some means for preventing dust and dirt which is blown upwardly into the bag and separated from the air from falling backwardly into the exhaust nozzle of the cleaner.

It is known in the art to attach the lower end of a rigid tube to the inner lower open end of the bag neck and extend the tube upwardly into the bag to form a trap about its periphery as the bag is expanded by air pressure during use.

Difficulty has been experienced in attaching both the reenforcement and the dirt trap tube to the folded lower end of the bag on account of the folds in the bag.

Prior to the present invention it was usual practice to sew or stitch both the reenforcement and the dirt trap to the folded lower end of the bag which required separately holding both of these items during the sewing operation and sewing across the folds of the bag as the seam was made about the periphery of the folded and

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narrowed end thereof while the reenforcement and dirt trap were held in place on the inner and outer sides of the folded open bag end.

According to the present invention the reenforcement and dirt trap are made of a single blank of a comparatively stiff paper, impregnated with a cement which may be thermosetting, so that both the reenforcement and the dirt trap may be applied to the lower folded open end of the paper bag by a simple operation.

The blank is cut and scored to form the proper panels, flaps and tabs. The blank is then folded along longitudinal scoring lines and the free edges secured together to form a double layer sleeve which may be expanded into a circle by pressing inwardly on the edges thereof.

The flat end, which eventually forms the dirt trap, is inserted into the flat open end of the porous paper bag inside opposed folds with a locating notch formed in the reenforcement and positioned at the edge of the material of the open end of the bag. The various flaps and tabs are then folded backwardly over the outside of the folded open end of the bag, two of the flaps or tabs being folded inwardly from the outside to overlap the interior of the folds resulting in a construction in which the upper and lower folds of the bag are permanently sealed against unfolding movement, while the central folds are free to be expanded to form a circular neck of a diameter to fit the exhaust nozzle of the cleaner.

The open end of the bag and the combined reenforcement and dirt trap is then expanded and telescoped over a heated form of substantially the same diameter as the exhaust nozzle of the cleaner. Heating shoes are then applied over the exterior periphery of the assembly to heat seal the material of the reenforcement and trap to the interior and exterior of the bag neck, it being noted that the material of the reenforcement is sealed interiorly and exteriorly of certain folds of the bag and extend across the folded edges thereof so as to lock the unoccupied folds against expansion at the lower open end of the bag and thus form a bag neck which when expanded is of substantially the same diameter as that of the exhaust nozzle to which it is to be applied and which may be easily telescoped over the exhaust nozzle with a positioning notch mating with a complementary detent on the exhaust nozzle.

The patent to Smellie 2,418,371, dated April 1, 1947, proposed to eliminate the necessity of separately sewing the dirt trap and reenforcing member to the mouth of the bag. However, according to the teaching of that patent it is nec-

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essary to separately secure the unoccupied folds to each other prior to the application of the dirt trap and then to separately secure the dirt trap and reinforcement to the bag mouth.

The present invention is an improvement over the Smellie construction in that it eliminates the necessity of separately securing the unoccupied folds to each other while retaining the function of the separate securing means.

Other objects and advantages of the present invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

Figure 1 is a view of the blank of one form of the combined neck reenforcement and dirt trap of the present invention, the heavy single lines denoting cuts through the material and the light double lines denoting score or fold lines;

Figure 2 shows the blank of Fig. 1 applied to the open end of the filter bag preparatory to the heat sealing operation;

Figure 3 is a perspective view of Figs. 1 and 2 opened preparatory to applying it to the heat sealing apparatus of Fig. 6;

Figure 4 is a perspective view showing how the combined neck reenforcement and dirt valve of Fig. 1 is applied to the filter bag preparatory to the folding operation;

Fig. 5 is a perspective view of the invention of Fig. 1 in the final stages of the folding operation;

Figure 6 is a perspective view of a preferable heat sealing apparatus as the dirt valve and positioning reinforcement is being heat sealed;

Figure 7 shows the second modification folded preparatory to the heat sealing operation; and

Figure 8 shows the blank for the second modification.

Referring to the drawings, the porous filter bag is generally indicated by the reference numeral 10. It is formed by a bag forming machine in a manner well known in the art and is adapted to be enclosed in a protecting pervious cloth bag as disclosed in the United States patent to Smellie 2,418,371, dated April 1, 1947.

As shown in Fig. 4 the bag 10 is folded so as to have on each side three outwardly extending reentrant or accordion-like folds 11, 12 and 13 and two inwardly extending reentrant or accordion-like folds 14 and 15 extending the full length thereof. The open end of the bag 10 is cut in a shallow V-shape as shown at 16.

The reenforcing and valve element comprises a valve portion 17 and a reenforcing portion 18. The blank of the first modification is shown in Fig. 1. The reenforcing portion 18 comprises a central reenforcing extension 19, side reenforcing extensions 20, intermediate flaps 21, connecting tabs 22 and locking tabs 23. The valve portion 17 comprises a central panel 24 and side panels 25 and 26. The side panel 25 is provided with an extension 27 shown separated therefrom by a dash line as shown in Fig. 1.

The extension 19 and panel 24 are connected by a fold line 28 and at their central junction they are formed with a circular opening 29, which the fold line 28 intersects, for a purpose which will later appear.

The tabs 21 are connected to connecting tabs 22 and to tabs 23 by fold lines 30 and 31, respectively. The tabs 22 are connected to flaps 20 by fold lines 32. The flaps 21 are separated from the flap 19 and the tabs 23 from the panel 24, by cut lines 33 and 34. The extensions 20 are secured to panels 25 and 26 by fold lines 35

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as shown. The panels 25 and 26 are connected to panel 24 by fold lines 36.

The blank of Fig. 1 is stamped from the rolls or sheets of paper preferably impregnated with a heat sealable cement of any suitable character.

Assembly of the modification of Figs. 1 to 5, inc.

The blank of Fig. 1 is manually manipulated and the panels 25 and 26 folded over the panel 24, about fold lines 36, with the extension 27 of panel 25 overlapping the free edge of panel 26. If desired, the extension 27 may be sealed to the panel 26 in any suitable manner. The tabs 22 and 23 and flaps 21 are spread outwardly as shown in Fig. 4 which leaves the spaces 37 in the top edge of the panel 24, which openings were formerly occupied by the locking tabs 23.

The folds of the open end of the bag 10 are then separated as shown in Fig. 4 and the flat valve or dirt trap portion inserted so as to occupy a position between mating folds, preferably the middle folds 12. The insertion is continued until the edge of the opening 29 is located at the apex of the V-shaped end 16 of bag 10 as shown in Fig. 2.

The open end of the bag 10 is then collapsed and the extensions 20 turned rearwardly and underneath over the ends of folds 13 and 15 so that the edges of extensions 20 will overlap, as shown in dotted lines 38 of Fig. 2, to leave the flaps 21 and the tabs 22 and 23 extending sidewardly from the edges of the bag 10. That will lock the folds 13 and 15 together.

The flaps 21 are then turned toward each other along lines 30 across the edges of the bag 10 to overlap folds 11, 12 and 13 with the flaps 21 lying over the material of the upper side of bag 10 above the openings 37 in the panel 24 so as to reenforce the bag mouth at those points. The tabs 22 will form a continuation of extensions 20 and will lie on the opposite side of the bag mouth from the flaps 21.

The locking tabs 23 are then turned inwardly across the edge of the folds of the bag mouth and will occupy the openings 37 which they originally occupied as shown in Fig. 3. The extension 19 is then turned backwardly over the V-shape end 16 of the bag mouth. The locking tabs 23 and the extension 19 lock the folds 11 and 14 while the junction between the flap 21 and tab 22 also lock the folds 11, 12 and 13 across the edges of the bag 10.

The material of the flaps, extensions, tabs and panels, positioned as above described, are then heat sealed to the material of the bag mouth both inside and outside in any suitable manner, but preferably by the apparatus shown in Fig. 6. The heat sealing operation will permanently lock the folds of the bag together, permanently attach the dirt trap 17 to the inside of the bag mouth and reenforce the bag mouth both inside and outside.

The bag mouth is then ready for application to an exhaust nozzle of a suction cleaner similar to that shown in the United States patent to White 2,295,981, dated September 15, 1942. The notch formed by the opening 29 corresponds to the notch shown in the White patent.

The mechanism of the apparatus of Fig. 6 is mounted on a suitable support 50. A mandrel 51 projects forwardly from the support and is surrounded by four heating shoes 52 innerleaved at 53 so as to form a complete annulus when in closed position. The heating shoes are recipro-

cated inwardly and outwardly by air cylinders 54 controlled by a suitable valve mechanism operated in any suitable manner.

The mandrel 51 and the shoes 52 are heated by electric heaters to approximately 250° F. and controlled by a timer which applies heat for approximately 11 seconds. The timer may also control the valve mechanism for reciprocating the shoes 52.

In operation the mouth of the bag is expanded as shown in Fig. 3, its open end slid over the mandrel 51, as shown in Fig. 6 and the machine operated to heat seal the various flaps, extensions, panels and tabs to the material of the bag on both the inside and outside.

In the modification of Figs. 7 and 8 the combined valve and reinforcement comprises a valve portion 60 and a reinforcing portion 61. The valve portion 60 comprises a central panel 62 and side panels 63 connected to the central panel 62 by fold lines 64. Central reinforcing extensions 65 and 66 are separated from each other by a cut line 67 and are attached to the central panel 62 by diagonal fold lines 68 and 69 respectively, which meet substantially centrally of the central panel 62 to form an outwardly extending apex. Side reinforcing flaps 70 are connected to the side panels 63 by fold lines 71 which form a continuation of lines 68 and 69. Circular openings 72 are formed in the blank on the meeting line 71 adjacent the edges of side panels 63 and side flaps 70 as shown in Fig. 8.

A suitable glue or cement which may be pressure sensitive, heat sealable or of any other kind is applied to one face of the material of the blank above the dot-dash line 73 of Fig. 8. The material of the blank may be impregnated with a heat sealable cement as in the first modification.

Assembly of Figs. 7 and 8

The side panel 63 is folded over on top of the panels 62 along the fold lines 64 so as to overlap as shown at 74 of Fig. 7. If desired, the overlapping portions 74 may be glued or cemented to each other in any suitable manner.

The mouth of the bag 10 is then opened as shown in Fig. 4 and the valve portion 60 inserted between mating folds, preferably the central folds 12, until the edge of the openings 72 mates with the V-shaped edge 16 of the bag mouth as shown in Fig. 7. The central extensions 65 and 66 are then folded backwardly and downwardly over the bag mouth so as to overlap as shown at 75 of Fig. 7, which will lock the folds 13 and 15 of the bag. The side extensions 70 are then turned backwardly and upwardly over the edge of the bag mouth so as to overlap as shown at 76 in Fig. 7, it being noted that the openings 72 will mate to form a semi-circular notch in the edge of the bag mouth. The side flaps 70 will thus lock the upper folds 11 and 14.

The glue or cement may then be activated in any suitable manner. If it is heat sealable the machine of Fig. 6 may be used as previously described. If the cement is pressure sensitive pressure may be applied either by the machine of Fig. 6 without using heat or in any other suitable manner.

According to both modifications, both the upper folds 11 and 14 and the lower folds 13 and 15 are permanently sealed to each other leaving the folds 12 free to expand to form the bag mouth and that, without the use of sepa-

rate means for securing the unoccupied folds together.

While I have shown and described but two modifications of my invention it is to be understood that those modifications are to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure or method shown and described but to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. The method of making a filter bag comprising the steps of, stamping a blank from paper impregnated with a heat sealable cement, said blank being straight at one end and having reinforcing extensions connected to its other end by fold lines, folding said blank into the form of a flat sleeve with reinforcing extensions extending from each flat side thereof, inserting the straight end of said sleeve between opposed folds of a tube of filter material having accordion-like folds extending inwardly from its opposed sides and two unfolded sides with the edges of said sleeve lying between the apices of the opposed folds, folding said reinforcing extensions across the ends of said folds to lie against the opposed unfolded sides of said tube and applying heat to the inner surface of said sleeve and to the outer surface of said extensions to bond said sleeve to the inner surface of said folds and to bond said extension to the outer surface of the unfolded sides of said tube.

2. The method of making a filter bag comprising: forming an open ended tube of filter material folded along its opposite sides to form a pair of central opposed outwardly extending reentrant folds, and a pair of flat unfolded sides which cooperate with said central folds to form pairs of outer opposed outwardly extending reentrant folds with the apices of said folds extending along the edges of the unfolded sides and with the walls of said folds on each edge of said tube superimposed upon each other and upon the unfolded sides; forming a flat sleeve having integral extensions formed on both sides at one end; inserting the free end of said sleeve into said central opposed folds with its edges positioned within the apices thereof; folding said extensions across the ends of said folds to lie against the unfolded sides of said tube and securing said sleeve to the walls of said central folds and said extensions to the unfolded sides of said tube.

3. The method of making a filter bag comprising: forming a flat open ended folded tube of filtering material folded along its opposed sides to form a plurality of opposed outwardly extending reentrant folds and opposed unfolded sides with the apices of said folds extending along the edges of the unfolded sides and with the walls of said folds superimposed upon each other and upon the unfolded sides at each edge of said tube, cutting said folds and the unfolded sides at the open end of said tube to form a shallow reentrant V-shaped end, forming a flattened tubular sleeve having integral extensions on both sides and a locating notch formed centrally on its one side at one end of said sleeve, inserting the unextended end of said sleeve into one pair of said opposed folds with its edges lying within the apices of said folds and the inner edge of said locating notch positioned at the apex of the shallow reentrant V-shaped end of the tube, folding said extensions across the ends of said folds to lie against the unfolded sides of said tube and securing said extensions to said unfolded sides and said sleeve

to the walls of the folds in which it is positioned.

4. The method of making a filter bag comprising, forming an open ended tube from filtering material, folding said tube along two of its opposed sides to form a plurality of opposed outwardly extending reentrant folds and opposed unfolded flat sides with the outer apices of said folds extending along the edges of the unfolded sides and with the walls of said folds superimposed upon each other and upon the unfolded sides of said tube at each edge thereof, forming a flattened sleeve having integral extensions on each side at one end inserting the unextended end of said sleeve into one pair of said opposed folds with its edges lying within the apices of said folds, folding said extensions over the ends of said folds to lie against the outer surface of the unfolded sides of said tube at its open end, bonding said sleeve to the inner surface of the folds in which it is positioned and bonding said extensions to the outer surface of the unfolded sides of said tube.

5. The method of making a filter bag comprising, folding an open ended tube of filtering material along two of its opposed sides to form a plurality of mating outward extending accordion-like folds and opposed flat unfolded sides with the outer apices of said folds extending along the outer edges of the unfolded sides and with the walls of said tube superimposed upon each other and upon the unfolded sides of said tube at each edge thereof, forming a flattened mouth and dirt trap forming sleeve from paper impregnated with a heat sealable cement, said sleeve having integral extensions on each side at one end thereof, inserting the unextended end of said sleeve into one pair of said opposed folds with its edges positioned within the apices of said folds, folding said extensions over the end of said folds to lie against the outer surface of the unfolded sides of said tube and applying heat to the inner surface of said sleeve and to the outer surface of said extensions to heat seal them to the open end of said folded tube.

6. The method of making a filter bag comprising: forming a blank from a sheet of paper impregnated with a heat sealable cement and having a dirt trap and bag mouth forming portion and a reinforcing portion; said trap forming portion including a central panel and a side panel hinged to each side edge of said central panel; said reinforcing portion including a central extension hinged to said central panel, a side extension hinged to each of said side panels on a diagonal fold line sloping toward said central panel, a flap hinged to the inner edge of each of said side extensions by a diagonal fold line and a locking tab hinged to the lower side of each of said flaps by fold lines forming a continuation of the fold lines for said side extensions and being cut from the material of said central panel; folding said side panels over said central panel so that their edges overlap; bonding the overlapping edges to each other; inserting said folded trap forming portion into the central fold of a flattened open end filter bag having accordion-like folds in its opposed edges; folding said central extension across the ends of said folds to lie against one of the unfolded sides of the bag; folding said side extensions across the ends of said folds to lie against the other unfolded side of said bag; folding said flaps across the folded edges of the bag to lie against the first unfolded side of the bag on either side of said central extension; folding said locking tabs across the ends of said

fold to lie against the interior of the central fold of the bag and applying heat to bond said panels, extensions, flaps and tabs to the surface of the bag where they contact therewith.

7. The method of making a filter bag comprising; forming a blank from a sheet of paper having a dirt trap forming portion and a reinforcing portion; said trap forming portion including a central panel and a side panel hinged to each side edge thereof; said reinforcing portion including a side extension hinged to one end of each of said panels on a diagonal fold line sloping away from said central panel, a pair of central extensions hinged to said central panel on fold lines forming extensions of the fold lines of said side extensions, said central extensions being separated by a cut line extending diagonally sideward from the junction of their fold lines; folding said side panels over on said central panel so that their edges overlap; bonding said overlapping edges to each other; inserting the folded trap forming portion into the central folds of a flattened open ended filter bag having accordion-like folds in each of the opposite edges thereof; folding said central extensions across the ends of the folds to lie against one unfolded side of said bag; folding said side extensions across the ends of the folds to lie against the other unfolded side of the bag and bonding said panels and extensions to the surface of the bag where they contact therewith.

8. In a suction cleaner, an open ended filter bag folded along two of its opposed sides to form a plurality of opposed mating outwardly extending accordion-like folds and opposed flat unfolded sides with the outer apices of said folds extending along the edges of the unfolded sides and the walls of said folds being superposed upon each other and upon the walls forming the unfolded sides of said bag at each edge thereof, the material of said folds and flat sides being cut to form a shallow reentrant V-shaped open end for said bag, a flattened mouth forming sleeve positioned within one pair of said opposed folds with its edges extending to the outer apices of said folds, integral extensions on each side of said sleeve, said extensions being folded across the ends of said folds to lie against the outer surface of said flat unfolded sides, a locating notch formed centrally in one side of said sleeve, the inner edge of said notch being located substantially at the apex of the V-shaped open end of said bag, said sleeve and extension being impregnated with a heat sealable cement, said sleeve being heat sealed to the inner sides of the folds in which it is positioned and said extensions being heat sealed to the outer surfaces of the unfolded sides of said bag.

9. In a suction cleaner, an open ended filter bag folded along opposite sides to form a plurality of opposed pairs of outwardly extending reentrant folds and opposed flat unfolded sides with the outer apices of said folds extending along the edges of said flat sides with the walls of said folds being superposed on each other and upon the walls forming said flat sides at each edge of said bag, a flattened tubular sleeve positioned between the walls of one pair of said opposed reentrant folds with its edges extending to the apices thereof, extensions integral with each side of said flattened tubular sleeve, said extensions extending across the ends of said folds and the unfolded sides at the open end of said bag to lie against the outer surface of said unfolded sides, the walls of said sleeve be-

ing bonded to the walls of the folds in which it is positioned and said extensions being bonded to said unfolded sides, said sleeve and extensions forming the sole means for locking the unoccupied folds against unfolding movement.

10. In a suction cleaner, an open ended paper filter bag folded along opposite sides to form a plurality of pairs of opposed outwardly extending reentrant folds and opposed flat unfolded sides, a flat tubular member having its edges positioned between the walls forming one pair of said opposed outwardly extending reentrant folds, integral extensions on each side of said tubular member extending across the ends of the walls of said reentrant folds and lying against the unfolded sides of said bag, said flat tubular member being bonded to the inside of the walls of the reentrant folds in which it is positioned and said extensions being bonded to the outside of the unfolded sides of said bag thereby locking the walls of the remainder of said reentrant folds to each other and constituting the sole means for preventing their expansion.

11. In a suction cleaner, an open ended paper filter bag folded along its length to form three opposed pairs of outwardly extending reentrant folds lying between two unfolded sides at each edge thereof whereby it can be flattened with the walls of the reentrant folds superimposed upon each other and upon the unfolded sides of the bag, a flattened tube having its edges extending into one pair of opposed reentrant folds, integral extensions on both sides of said flattened tube extending across the ends of the walls of said reentrant folds and lying against the unfolded sides of said bag, said flattened tube being secured to the walls of said reentrant folds in which it is positioned and said extension being secured to the unfolded sides of said bag, said tube and extensions forming sole connection between the walls of said reentrant folds.

12. In a suction cleaner, an open ended paper filter bag folded along its length to form three outwardly extending reentrant folds and two inwardly extending reentrant folds on each side so that the bag will lie flat with the walls of said reentrant folds superimposed, a combined dirt trap and reinforcing member associated with the open end of said bag, said member having a flattened tubular portion positioned between the walls of one pair of said outwardly extending reentrant folds and integral extensions formed on one end of both sides of said flattened tubular portion, said extensions being folded over the ends of the walls of said reentrant folds so as to lie against the unfolded sides of said bag and means for securing said tubular portion to the inner sides of the walls of the reentrant folds in which it is positioned and for securing said extensions to the unfolded sides of said bag, said folded over extensions forming the sole securing means between the walls of said reentrant folds.

13. In a suction cleaner, an open ended filter bag folded along two of its opposed sides to form a plurality of opposed mating outwardly extending accordion-like folds and opposed flat unfolded sides with the outer apices of said folds extending along the edges of the unfolded sides with the walls forming said folds being superimposed upon each other and upon the walls forming the unfolded sides of said bag at each edge thereof, a flattened tubular sleeve positioned within one pair of said opposed mating folds with its edges extending to the apices thereof, the remainder of said folds remaining unoccupied, ex-

tensions integral with each side of said flattened sleeve, said extensions extending across the ends of the walls of both the occupied and unoccupied folds and lying against the outer surface of the walls forming the unfolded side of said bag, the sides of said sleeve being bonded to the inside of the walls of the folds in which it is positioned and said extensions being bonded to the unfolded sides of said bag, said sleeve and extensions forming the sole means for holding the unoccupied folds from expanding.

14. In a suction cleaner, an open ended filter bag folded along two of its opposed sides to form three opposed mating outwardly extending accordion-like folds and opposed flat unfolded sides with the outer apices of said folds extending along the edges of the unfolded sides and with the walls of said folds being superimposed upon each other and upon the flat unfolded sides at each edge of said bag, a flattened tubular mouth forming sleeve positioned within the central pair of said opposed folds with its edges extending to the apices of said central folds, extensions integral with each side of said sleeve, said extensions extending across the ends of the folds on opposite sides of said central folds and lying against the outer surface of the unfolded sides of said bag, said sleeve and extensions being impregnated with a heat sealable cement, said sleeve being heat sealed to the inner surface of said central folds and said extensions being heat sealed to the outer surface of the unfolded sides of said bag.

15. In a suction cleaner, an open ended filter bag folded along two of its opposed sides to form a plurality of opposed mating outwardly extending accordion-like folds and opposed flat unfolded sides with the outer apices of said folds extending along the edges of the unfolded sides and with the walls of said folds being superimposed upon each other and upon the walls forming the unfolded sides of said bag at each edge thereof, the material of said folds and flat sides being cut to form a shallow reentrant V-shaped open end for said bag, a flattened mouth forming sleeve positioned within one pair of said opposed folds with its edges extending to the outer apices thereof, integral extensions on each side of said sleeve, said extensions being folded across the ends of said folds to lie against the outer surface of said flat unfolded sides, a locating notch formed centrally in one side of said sleeve, the inward edge of said notch being located substantially at the apex of the V-shaped open end of said bag, said sleeve being secured to the inner surface of the folds in which it is positioned and said extension being secured to the outer sides of said flat unfolded sides.

16. In a suction cleaner according to claim 15 in which the fold lines between the sides of said sleeve and said extensions form an outwardly extending V-shaped edge on one side of said sleeve and a reentrant edge on the other side thereof with said notch being located at the apex of said reentrant edge.

17. A blank for forming a dirt trap and reinforcement for a filter bag mouth comprising, a substantially rectangular central panel, a side panel hinged to each side edge of said central panel, the combined widths of said side panels being greater than the width of said central panel, a central extension hinged to the central portion of one end of said central panel on a fold line normal to the side edges of said central panel, a side extension hinged to one end of each

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side panel on diagonal hinge lines sloping toward the hinge line for said central extension, a flap hinged to the inner edge of each of said side extensions on fold lines forming continuations of the fold lines between said central and side panels so as to overlie said central panel, said flaps being separated from said central extension by a diagonal cut, and a locking tab hinged to the lower edge of each flap on hinge lines forming a continuation of the hinge lines between said side panels and side extensions, said locking tabs being cut from the material of said central panel.

18. A blank according to claim 17 in which a circular opening is cut centrally in said central panel and extension on the fold line between them to form a locating notch when the blank is folded about a bag mouth.

19. A blank for forming a dirt trap and reenforcement for attachment to a filter bag mouth comprising, a central substantially rectangular panel, a side panel hinged to each lateral edge of said central panel, the combined widths of said side panels being greater than the width of said central panel so as to overlap when folded over upon said central panel, a pair of extensions hinged to one end of said central panel on sloping hinge lines meeting at an outwardly extending apex centrally of said central panel, said central extensions being separated by a cut line extending diagonally from said apex and a side extension hinged to each side panel on hinge lines forming extensions of the hinge lines between said central panel and central extensions.

20. A blank according to claim 19 including locating openings cut in each of said side panels and extensions on their fold lines adjacent their free edges so as to mate when said side panels are folded upon said central panels.

21. In a filter bag, a flattened trap forming sleeve positioned in the central folds of an open end flattened bag of filter paper having accordion-like folds extending inwardly from its opposite edges, a first reenforcing extension of less width than said flattened sleeve centrally attached to one side of said sleeve and extending across the folds on one side of the bag and lying against one of its flat sides, second and third reenforcing extensions attached to the other side of said sleeve on diagonal fold lines meeting centrally of said other side of said sleeve to form an outwardly extending apex, said second and third extensions extending across the ends of the folds on the other side of the bag and lying against the other flat side thereof, a reenforcing flap attached to the outer edges of said second and third reenforcing extensions and extending across the edges of the bag at its open end and

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lying against the first mentioned flat side of the bag at opposite ends of said first reenforcing extension, and a locking tab attached to each flap and extending across the ends of the folds on the first mentioned side of the bag and lying against the interior surface of the central folds of the bag, said sleeve, extension, flaps and tabs being bonded to the surface of the bag walls with which they are in contact.

22. In a filter bag according to claim 21 in which the open end of said bag is cut to form a shallow reentrant V-shaped end and said first reenforcing extension and the first mentioned side of said sleeve are formed with an inwardly extending positioning notch having its inner edge positioned at the apex of said V-shaped end.

23. In a filter bag, a flattened trap forming sleeve positioned in the central folds of an open ended flattened bag of filter paper having accordion-like folds extending inwardly from its opposite edges, first and second reenforcing extensions attached to one side of said flattened sleeve on outwardly inclined fold lines meeting centrally of said one side to form an outwardly extending apex, said first and second extensions extending across the ends of the folds on one side of the bag and lying against one flat side thereof adjacent said open end, third and fourth reenforcing extensions attached to the other side of said sleeve on fold lines inclined in the opposite direction from the first mentioned fold lines and meeting at a reentrant apex centrally of said other side of said sleeve, said third and fourth extensions extending across the folds on the other side of the bag and lying against the other flat side thereof adjacent its open end, said sleeve and extensions being bonded to the surfaces of the walls of said bag with which they are in contact.

24. In a filter bag according to claim 23 in which the open end of said bag is cut to form a shallow reentrant V-shaped end and said third and fourth extensions and the second mentioned side of said sleeve are formed with an inwardly extending positioning notch having its inner edge positioned at the apex of said V-shaped end.

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