

Jan. 3, 1956

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2,729,150

MULTI-PLY BAGS AND METHODS FOR MAKING SAME

Filed April 15, 1952

3 Sheets-Sheet 1

Fig. 1.

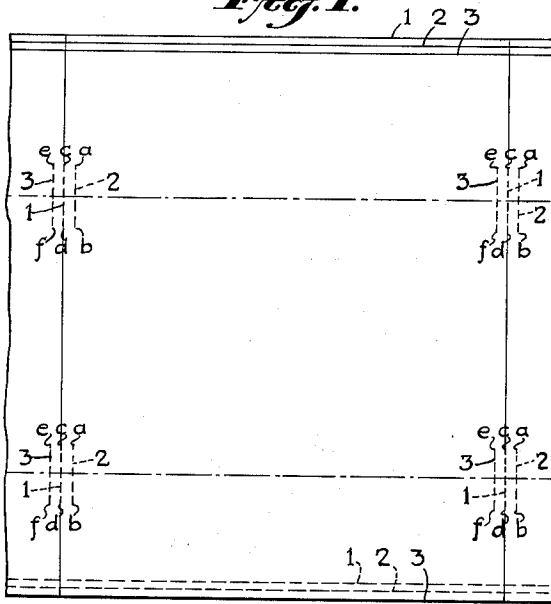


Fig. 2.

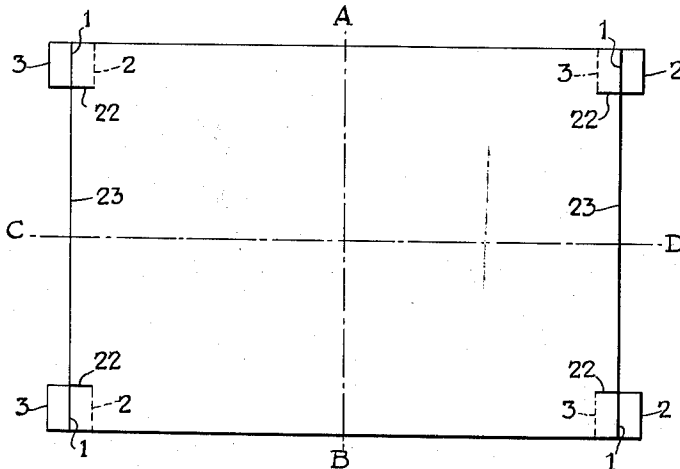
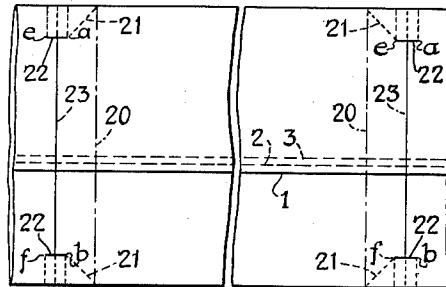


Fig. 3.

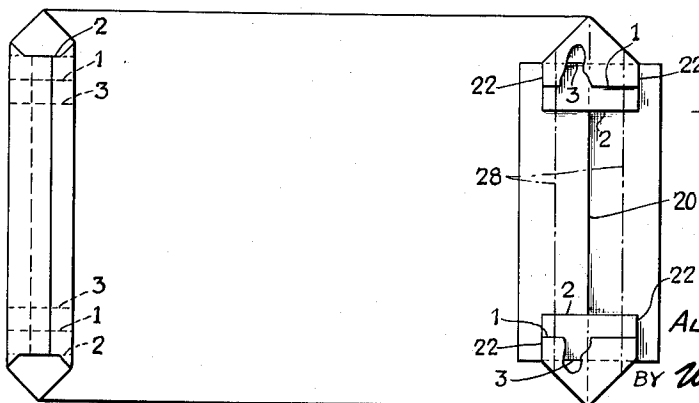


Fig. 4.

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Fig. 6.

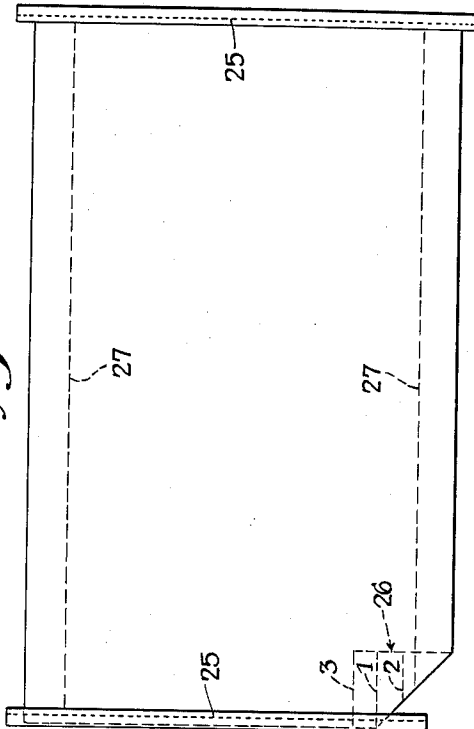


Fig. 8.

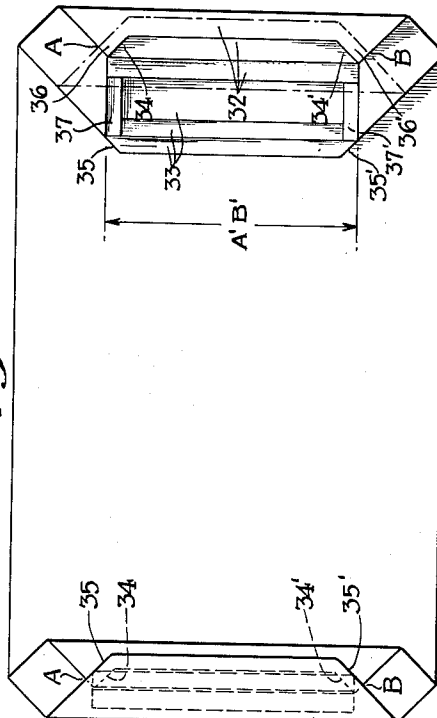


Fig. 5.

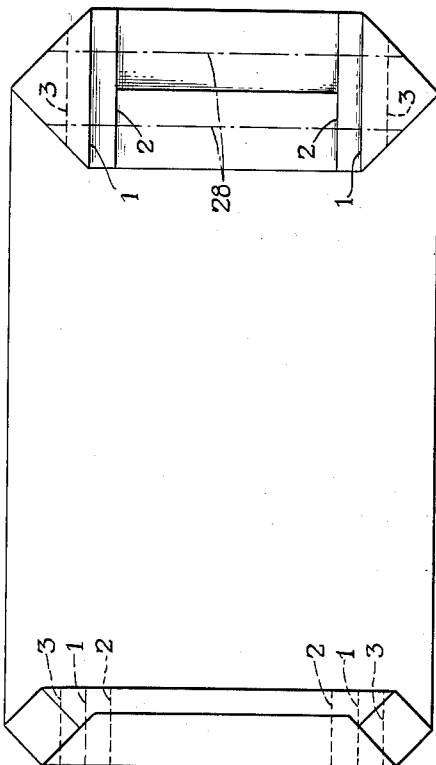
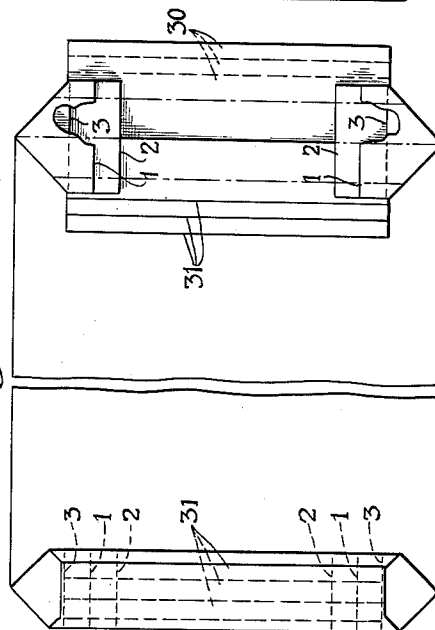


Fig. 7.



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Fig. 9.

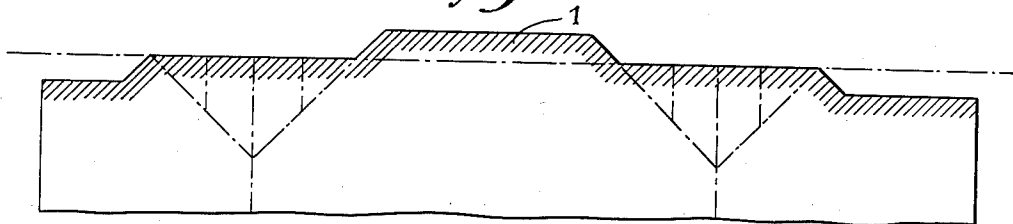


Fig. 10.

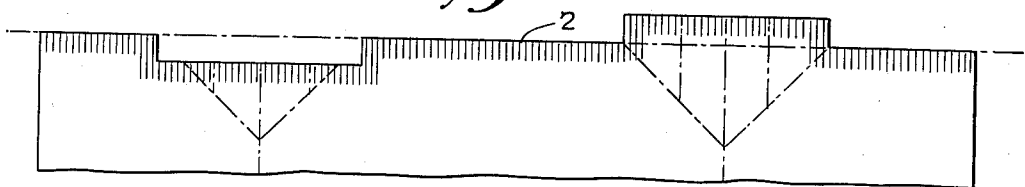


Fig. 11.

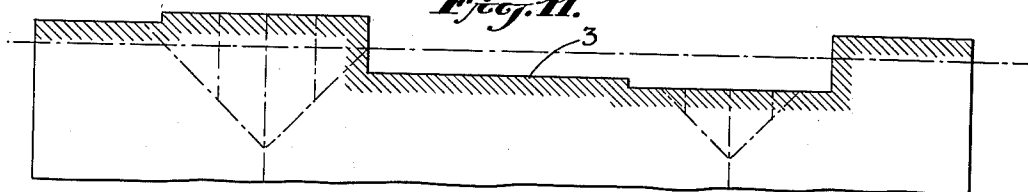


Fig. 12.

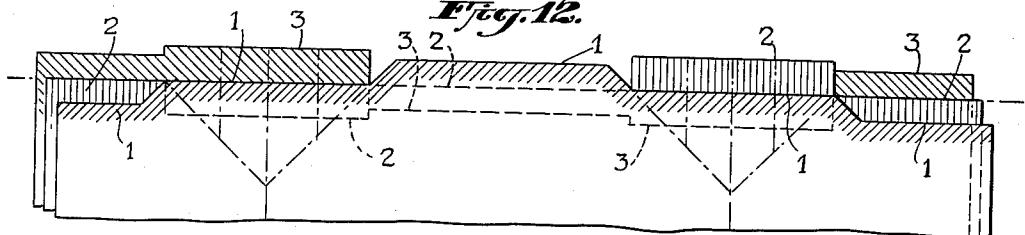


Fig. 13.

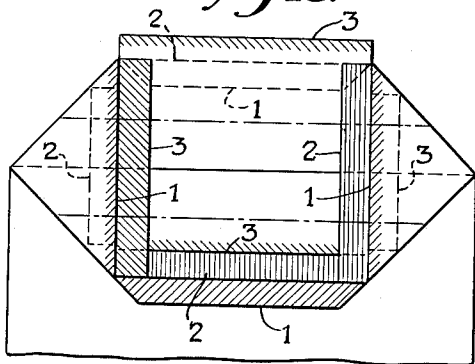
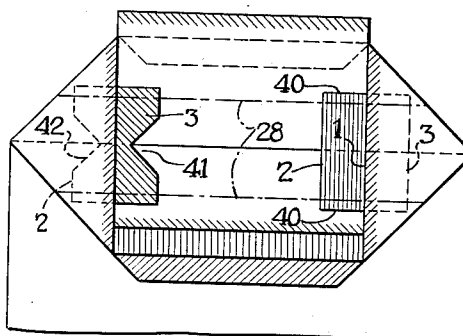


Fig. 14.



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MULTI-PLY BAGS AND METHODS FOR MAKING SAME

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Application April 15, 1952, Serial No. 282,350

Claims priority, application Netherlands April 28, 1951

5 Claims. (Cl. 93—35)

This invention relates to multiwall bags of paper or other flexible sheet material, and more particularly to bags of that type formed with novel arrangements of stepped end closure flaps, and methods for making same.

Multiwall bags with end closure flaps of various types, with some or all of the flaps of stepped form have been well known for some time. In some of these it has been proposed to provide the end edges of the so-called side flaps only in various stepped relations, and in others only the edges of the corner flaps. However, these known constructions have all involved certain disadvantages and difficulties, particularly as to the stepping of the corner flaps, which is important in securing a multiwall bag of adequate strength and which at the same time will have corner areas free of excessive stiffness and brittleness caused by superposing a multiplicity of glued folded-over areas.

With the present invention, a form of stepped corner flap construction is provided with which all four corners of the bag may be conveniently made of equal strength and having the very same degree of flexibility and freedom from stiffness and yet being made with such a stepped form as to avoid cutting out and wasting any loose pieces of paper. This is accomplished by scoring or perforating a plurality of the webs of the sheet material at regular intervals transversely of their length at lines which are to define the end edges of the corner flaps of the finished bags, then such webs are assembled by superposing same in such relation longitudinally that said lines on the web which is to form the outer ply of the bags, are located in positions midway between the score lines on one under ply and those on another under ply. Then when the assembled webs are formed into a tube and the tube is separated at bag length intervals, each bag blank will have a corner flap portion, the outer ply of which is of normal length as compared with an under ply thereof of abbreviated length, and another of more extended length. Thus each corner of one bag will not only contribute from one of the plies forming same, material for forming an extension of one of the plies at a corner of the next adjacent bag formed from the same webs, but the corners of the next adjacent bag reciprocally contribute from one of their plies material to provide extensions of one of the plies at the corners of the first bag. Each corner flap will thus have plies of three different lengths, and the ends of two of such plies at least will be in such stepped relation that the side flaps may be secured thereto respectively by stepped lines of pasting. These novel stepped corners may be formed on bags having either stepped or non-stepped side flaps, or may be combined in a new relationship with stepped side flaps to provide bags, the end flaps of which are stepped "all around" in a coordinated way and having strength and flexibility characteristics not previously attainable.

The nature and advantages of the invention may best be understood by first considering the shortcomings of various of the prior stepped end bags, starting with that of

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German patent to Hoppe No. 557,061. While this discloses end closure flaps which are all stepped, with half of the circumference stepped in one direction and the other half in the other direction, yet at one corner the steps face the inside of the bag so that the outer ply only of such corner can be pasted to the side flaps when the latter are folded over. If the side flaps are to be pasted to more than one ply of a corner flap, as is highly desirable for strength, such corner flap must, of course, have stepping which is "open," that is, stepping which faces outwardly of the bag to permit a plurality of ply ends to contact with and be pasted to the side flaps. Also the construction of this German patent has the disadvantage that portions of the steps on the corners which do have "open" steps are too short for being properly overlapped by and properly pasted to the side flaps, and furthermore, the end portions of the side flap steps cannot readily and properly be covered when the flaps are all folded down.

In the bag of U. S. patent to Robinson No. 2,073,222, while all end closure flaps are stepped, the necessary reversal of the direction of stepping on one side as compared with the other occurs midway of each corner flap. This involves making certain angular wasted "cut-outs" and also incurs very complicated folding operations. Furthermore, if one of the corners is to be used as a valve corner, since the steps will have angularly shaped gaps and be half "open" and half covered, the corner requires application of a special valve reinforcing area of paper.

Further proposals to provide stepped corner flaps are disclosed in Hoppe et al. U. S. Patent No. 2,176,499, but here the stepping is accomplished only by complicated constructions which also involve the forming of wasted cut-out pieces.

Another proposal is shown by U. S. patent to Hoppe No. 2,122,061, whereby all plies of the valve corner flap are extended in length by utilizing material cut from a corner of the next succeeding bag tube being formed, but this results in a relatively stiff corner flap attained by substantially weakening another corner with no compensating advantage.

Coty U. S. Patent No. 2,346,292 shows another variation wherein the outer ply of two corner flaps is extended by utilizing material cut from two corners of the next succeeding bag being formed, but this and all similar prior expedients, so far as I am aware, have been such as to destroy the uniformity or harmony of the bag construction in respect to the matter of providing stepped corners all of which will be equally free of weakness or excess stiffness and not involve wasted cut-outs.

In view of the difficulties above pointed out with the prior stepped corner constructions, the multiwall bag industry in this country and most others, has found it preferable to forego the provision of stepped corner flaps in stepped bags. Yet the forming of bags with properly stepped side flaps, but with unstepped corner flaps results in a considerable abbreviation of the corner flaps as compared with the length which they should desirably have. In order in some measure to counterbalance this abbreviation and increase the overlapping of the corner and side flaps, cuts have been made between them, but with such cuts the construction still is such that there is danger that the corner flaps will be blown out, during or after the filling of the bag, especially at the valve flap, because the unstepped valve flap is still not as long as advisable. This fact, among others, has led to the common practice of going to the trouble and expense of pasting a reinforcing slip or an extension of some form onto the valve flap. Furthermore, inevitably interpast-ing of the plies of unstepped corner flaps involves the use of superposed lines of glue, so that the corners become brittle, relatively inflexible and liable to break-

age due to stiffness, especially when the number of plies is increased.

Various further and more specific objects, features and advantages of the invention hereof will appear from the detailed description given below, taken in connection with the accompanying drawings which form a part of this specification, and illustrate by way of example the presently preferred embodiments of the invention.

In the drawings:

Fig. 1 shows an assembly of three superposed webs with transverse weakened or cut lines thereon respectively in proper relative positions for defining the end edges of the corner flaps of the finished bags made according to one example of the invention;

Fig. 2 is a view of the same webs as of Fig. 1 after same have been folded and formed into a tube, this figure also indicating the positions of certain flap fold lines and slits for separating the corner flaps from the side flaps, according to one embodiment of the invention;

Fig. 3 is a view of one of the separated bag lengths formed from the tube as of Fig. 2 and also indicating by dash-dot lines how this bag length may be cut into either two or four bag blanks, as hereinafter explained;

Fig. 4 shows a bag made from a bag length as shown in Fig. 3, the left hand end of Fig. 4 showing the appearance of the bag after the corner flaps and side flaps have been folded to closed position to form a flat bottom for the bag, and the right hand side of Fig. 4 showing the corner flaps folded in, but with the side flaps still open;

Fig. 5 is a view similar to Fig. 4 except that in Fig. 4 the side and corner flaps are separated by slits, whereas in Fig. 5 the side and corner flaps are joined by diagonal folds;

Fig. 6 shows a valve bag with sewn end closures, the bag blank of which may be formed by utilizing one-fourth of the assembly shown in Fig. 3;

Fig. 7 is a view similar to Fig. 5, but showing the application of the invention to a bag having stepped side flaps separated by slits from the corner flaps;

Fig. 8 is a view showing a bag end closure made with a novel form of stepped side flap construction correlated with corner flaps similar to those of Fig. 5, the left hand end of Fig. 8 showing the flaps all in closed position, and the right hand end also showing the flaps all in closed position, except that the outermost side flap is shown before being folded to closed position;

Figs. 9-11, inclusive, show the manner in which the end portions of three plies may preferably be cut for a bag end as of Fig. 13 and similar to the bag end of Fig. 8;

Fig. 12 shows the manner in which the three plies of Figs. 9-11 are preferably assembled;

Fig. 13 shows the end of a bag made from the assembly of Fig. 12 and with the corner flaps folded in, but with the two side flaps still open; and

Fig. 14 illustrates a modification of the construction of Fig. 13.

Referring now to Fig. 1 in further detail, three webs of paper or other flexible sheet material from which the bags are to be made are here shown in superposed assembled relation, the webs being identified respectively by the numerals 1, 2 and 3 applied to the edges of the webs, the same numerals in this figure as well as in other figures being sometimes applied to lines of perforation or cutting to identify the web in which the cut or line is formed. While in this figure (as well as in various other figures) for simplicity only three webs are shown for forming a three-ply bag, it will be understood that, if desired, for bags with a greater number of plies, any one or all of the webs may be duplicated, that is, two or even more webs of identical outline and configuration may be used. Also, either all of the webs may be of paper, or some or all of same may be of other flexible sheet material suitable for forming multi-wall bags.

Preferably before the webs are superposed as in Fig. 1, each of same is perforated respectively along lines as at $a-b$, $c-d$ and $e-f$, these lines serving to define the inner end edges of the corner flaps of the finished bags. Such perforating may be accomplished for example by using perforator equipment suitably adjusted, such as shown in U. S. patent to Lienart 2,581,801, granted January 8, 1952, the webs, after being perforated individually, being assembled by superposing them in such relation longitudinally that the lines of perforation will be in the positions shown. That is, the lines $c-d$ on the web which is to form the outer ply of the bags, are located at positions intermediate and half way between the lines $a-b$ on one under ply, and the lines $e-f$ on another under ply. The term "under ply" as used herein is intended to refer to either or any of the plies other than the ply which is to form the outside of the finished bags.

It may be here noted that the lines $a-b$, $c-d$, and $e-f$, while preferably comprising lines weakened by perforating, could, if desired, depending on the type of tuber equipment used, be in the form of transverse cuts instead of perforations, and for convenience such lines, however made, will be hereinafter referred to as "score lines."

The position of the score lines $a-b$ will hereinafter sometimes be referred to as being "in advance" of the positions of the score lines $c-d$, and the score lines $e-f$ will sometimes be referred to as "spaced rearwardly" from the lines $c-d$.

The webs 1, 2 and 3 as shown in Fig. 1 are preferably assembled with their longitudinal edges relatively stepped as shown, and as the assembly passes through the usual tuber machine, it becomes folded along the two horizontal dot-dash lines shown in Fig. 1, to form a flattened tube, as of Fig. 2, the longitudinal stepped seam of which is pasted in the usual way.

As will be apparent from Fig. 2, after the continuous multi-ply tube is formed, the score lines above referred to will be located at the proper positions at the folded-over edges of the tube to define the end edges of the corner flaps of each bag length, after the tube is separated into sections as shown in Fig. 3. The dot-dash lines 20 in Fig. 2 indicate the location of the future fold lines which will occur along the median lines of the top and bottom end closures of the bag during the formation of the closure flaps. The dot-dash lines as at 21 in Fig. 2 indicate the position of the diagonal fold lines which will define the outer limits of the corner flaps when folded in to form the bag end closures.

If the corner and side flaps are to be separated by slits as for the construction as of Fig. 4, for example, then the ends of the score lines, as shown in Fig. 2, are interconnected by longitudinally extending cuts or slits 22 which extend through all plies of both the front and back surfaces of the bag. These cuts may be formed on the tuber machine in well known ways, either before the tube is formed as of Fig. 2, or thereafter, and before the continuous tube is separated into bag lengths.

After the continuous tube is formed, as of Fig. 2, to produce bag blanks as of the form shown in Fig. 3, the tube is transversely cut into sections along lines as at 23, these cuts passing through all of the plies and through both the front and back surfaces of the bag, and serving to interconnect the mid-portions of two of the slits 22 which are located adjacent two opposite corners at one end of a bag.

From Fig. 3 it will be noted that all four corners of the bag blank there shown are identical, except that at the two corners on one end of the bag blank, the innermost ply 3 is extended and the intermediate ply 2 is abbreviated, whereas on the other two corners, the innermost ply 3 is abbreviated and the intermediate ply 2 is extended. Thus for practical purposes, and at least so far as concerns strength, flexibility and freedom from excess stiffness, all four corners will be equivalents. And while a

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small amount of material is sacrificed from one ply at each corner to provide material for an extended ply on the corner of the next adjacent bag, yet that corner of the next adjacent bag in turn reciprocally provides for an extension on the corner of the first bag. Any tendency for loss of strength due to abbreviation of one ply at each corner, is more than compensated for by the extension of another ply at the same corner, for the reason that the end edges respectively of each ply on each corner flap will be spaced apart in stepped relation, and hence the glue lines for adhering such edges to other plies can be spaced apart, rather than being superposed. Thereby the available paper of the several plies of the end edges of the corner flaps is distributed over wider and more flexible areas, free from troublesome stiffness and brittleness, and providing corner flaps all of uniform over-all length, each long enough not to "blow out."

The assembly of Fig. 3 may, if desired, be cut into two along the transverse dot-dash line A—B to provide two halves, each comprising a bag blank suitable for forming bags, each with a flat stepped corner bottom, but each having an open mouth (formed at the line A—B). It will be evident that if this practice is to be adopted, the groups of score lines *a—b*, *c—d* and *e—f* should be made at intervals of two bag lengths, and for that purpose in practice the assembly as shown in Fig. 3 would usually be relatively longer than here shown, if open mouth bags are to be formed of customary proportions.

As further indicated by the dot-dash line C—D in Fig. 3, this assembly might also be cut along that line to form four bag blanks after cutting along line A—B. Each of these blanks may have their longitudinal edges which occur at line C—D suitably closed by overlapping and pasting, and the ends of these four bag blanks may be closed by sewn seams with closure tapes as indicated at 25 in Fig. 6. It will be noted that each of these four bag blanks will then embody one of the stepped corner flap areas which may be turned in as at 26 to form a three-ply valve flap, the outer (or upper) ply of which is of normal length, whereas one under ply thereof is abbreviated and another under ply is extended. Thus a valve flap having substantially the advantages of three steps at its inner end may be formed without any waster cut-outs of paper whatever, and the valve flap will have a flexible single ply extension formed without going to the expense of using any supplemental sheet or sleeve and without sacrificing any strength where needed at the valve area. The bags as of Fig. 6 may be formed either with or without gussets such as indicated by the dotted lines 27 along their vertical edges.

Reverting now to Fig. 4, the two corner flaps at the right hand end of the bag are here shown folded in, in position to form the corner portions of the end closure separated by the slits 22 from the side flaps, which are here shown prior to being folded in place. The side flaps may be folded inwardly, one overlying the other, by folding along base fold lines as at 28, after which the end closure will have the appearance shown at the left hand end of Fig. 4.

It may be noted that any one of the four corners of Fig. 4 may be utilized as the valve corner, since all are of the same strength and degree of flexibility, and all provide flaps with an inwardly extended flexible ply, well adapted for secure valve closing purposes.

While at both corners of the left hand ends of Figs. 3 and 4, it is the intermediate ply which is abbreviated, yet the score lines, if desired, could just as readily be so made that each end of the bag would have one corner with an abbreviated innermost ply and another corner with an abbreviated intermediate ply. This possibility is shown, in fact, by the diagrams of Figs. 9—13.

The above description as to Fig. 4 also applies to Fig. 5, with the sole exception that here the slits separating the corner and side flaps are omitted, as may readily be done

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in many cases, while still providing a bag end closure with corner flaps of adequate length.

In Figs. 3, 4 and 5, the outer ply of all of the corner flaps is of "normal" length; that is, before the flaps are folded in, the outer ply of each corner flap is of such length that its end edge will be on the same level as the end edges of the main body portion or remainder of the bag blank between the corners. Also, with the forms of the invention described below and which have stepped side flaps, the outer ply (referred to as of "normal" length) at each corner (before the flaps are folded in) is of a length such that its end edge will be on a level with a line which is substantially mid-way between the lines along which the longest and the shortest steps of the side flaps terminate.

In Fig. 7, the invention is shown as applied to a bag end closure which has stepped side flaps, so as to give the substantial advantages of a bag having all of its flaps stepped in a logical way to permit the stepped areas on each ply of each flap to be individually pasted respectively to a stepped area on one ply of another flap. As shown in Fig. 7, the steps 30 of the various plies on one side flap (which is to be the underlying side flap) are positioned respectively so as to come in contact with the steps 31 on the other side flap (which is to be the overlying side flap). Thus the side flap steps have what will be hereinafter referred to as a "coordinated" relationship. The left hand end of Fig. 7 shows the bag end closure completed with the stepped side flaps folded in position one to overlie the other in the proper stepped relation and with the end portions of the side flap steps overlying steps on each corner flap in a manner whereby a plurality of corner flap steps may be pasted directly to a plurality of side flap steps, thus insuring a most effective strong seal.

While in Fig. 7 the corner flaps are separated from the side flaps by slits, with the construction shown in Fig. 8, such slits are omitted and an arrangement of cooperating corner and side flap steps is provided, having certain distinct advantages which will be hereinafter described.

The corner flaps of Fig. 8 may be made by providing score lines the same as for the previous figures. The side flaps respectively are stepped as at 32—33 in a coordinated way, the length of the side flap steps preferably being equal to the dimension marked A'—B' of Fig. 8. Thus when the side flaps are folded over, the diagonal folds thereof will intersect at points A and B which, it will be noted, are spaced by a distance somewhat greater than the dimension A'—B'. This has a number of advantages of substantial importance not heretofore secured with attempts to provide multiwall bag end closures which are stepped "all around". First it will be noted that the overlying side flap when folded down (see left hand end of Fig. 8) will be such as to completely cover all of the stepped areas on the underlying side flap. Next, it will be noted that outwardly of the intersection points A—B there are no side flap areas overlying the exposed diamond shaped end flap areas and thus the diagonal folds at points A and B form a vertex with strong folded over edges, so that if any one of the corners is to be used as a valve corner, the upper side of the valve at its outlet will be constituted of folded-over junctures of the corner and side flaps and will have great strength against tearing. It will be appreciated if, as in some prior constructions, the ends of the stepped portions of the side flaps extend out beyond intersection points such as at A and B, then the upper outer portion of the valve opening would comprise in part an easily torn stepped ply of paper and in other parts stepped areas, the steps of which may catch on the filling tube when filling the bag. Since a considerable part of the weight of the bag when being filled is supported by the valve areas, it is important that the upper or cover side of the valve be as strong as possible. In order further to reinforce this area, preferably the outer step on each side flap is terminated at its ends, as shown in Fig. 8,

along an angle such that the ends of the step in effect constitute continuations of the diagonal fold lines, that is, the outer ply step 32 on the underlying side flap terminates along angularly positioned lines as at 34, 34' and the corresponding outer step 33 on the overlying side flap terminates at its ends along lines 35, 35'. As a result, the outer ply of neither of the side flaps has any cut off edges near the intersection points A and B. Furthermore, the areas indicated at 36, 36' are so positioned as to come into contact and be pasted to areas 37, 37'. These latter areas form parts of the extended corner flap ply portions and the pasting of same to the outer ply of the underlying side flap in this way contributes to the strength at these areas.

Fig. 9 shows how the end edge portions of the outer ply may be cut to form the outer ply of a bag as of either Fig. 8 or Fig. 13.

In Figs. 9-13, inclusive, the edges of each ply have distinctive cross hatching marks thereon to more clearly distinguish the edges of one ply from those of another in the assembly.

Figs. 10 and 11 illustrate how the end edges respectively of an intermediate and innermost ply may be cut for forming a bag end as of Fig. 13.

Fig. 12 shows the web end portions of Figs. 9-11 in proper assembled relation and ready to be folded into a tube.

In Figs. 9-14 inclusive, the extended and abbreviated plies at one corner are made complementary to the abbreviated and extended plies of the other corner of the same end of the bag. This avoids on the drawings any necessity of illustrating the contours of the ends of the plies for the other end of the bag, which may in all respects be complementary to the ends shown in Figs. 9-14. In practice, however, it will in most cases be preferable, as indicated in Figs. 1-5 inclusive, and 7, to make both corners of one end of the bag with the same ply abbreviated and with another underply extended at both corners of such bag end.

The form shown in Fig. 14 differs from that of Fig. 13 in that only the middle portions of the corner flaps are stepped, that is, they are stepped only for a distance sufficient so that the steps extend out as at 40 at each end slightly beyond the base fold lines 28-28, and consequently the corner flap steps may readily be increased in width somewhat, that is, the extended ply of each corner may be readily extended somewhat more than in the case of Fig. 13. Also the corner flap shown in the left hand side of Fig. 14 is so formed at its extended ply or step as to have a cut-out 41 and the abbreviated ply is so formed as to have a corresponding extension 42 at its mid-portion. It will be understood that the material taken from the cut-out area 41 will serve to form an extension, such as at 42, upon the abbreviated ply of the corner flap of the next bag and reciprocally the extension 42 will in effect be cut out from the extended ply of the next bag. The cut-out 41 facilitates entrance of material into the bag when this corner is being used as a valve corner and the extension 42 at the same time serves somewhat to strengthen this corner when used as a valve corner.

In all of the above-described embodiments of the invention which have stepped side flaps, as will be clear from Figs. 9-12, none of the corner flap steps corresponds in length to any of the side flap steps on corresponding plies. This is because on the corner flaps the outer ply is of "normal" length (as hereinabove defined), whereas on the underlying side flap the outer ply must be abbreviated and on the overlying side flap the outer ply must be extended. But if on the corner flaps the outer ply should be either substantially extended or abbreviated (contrary to the principles of this invention), it would be impossible to make all of the four corner flaps of the desired uniform equivalent construction and with the corner flaps all of equal strength with equal pasting areas

if obtained by separating an endless multiwall tube into sections.

With all of the forms of the invention it will be understood that the superposed areas of the various ply ends may be interpasted in customary ways. Also the portions of the underlying side flap which overlie corner flap areas are pasted to the latter in the usual way except at the valve corner, and the portions of the overlying side flap which come into contact with the underlying side flap are pasted thereto. The end portions of the overlying side flap are also pasted to such areas of the corner flaps as come into contact therewith, except at the valve corner. However, the interpasting of the plies in the corner flaps may usually be confined merely to spot pasting the abbreviated ply portions of the corner flaps to the ply or plies which have areas contacting therewith. In other words a considerable portion of the customary interpasting of the plies in the corner flaps may be dispensed with, thus leaving such flaps in much more pliable non-brittle condition than in bags where the corner flaps have no stepped effect or where the steps have to be interrupted part way across the edge of the flap.

All of the embodiments of the invention have the advantage that the way in which the corner flaps join the side flaps in all cases is the same at both sides of each of the four corners of the bag and thus well adapted for uniform engagement by the mechanism used in bottoming the bag. The forms of Figs. 8-14 inclusive are particularly well adapted for high speed bottoming operations.

Product claims for the various bag constructions herein disclosed are being made in applicant's co-pending application Serial No. 394,438, filed November 25, 1953, entitled "Multi-Ply Bags with Stepped Corner Flaps."

Although certain particular embodiments of the invention are herein disclosed for purposes of explanation, various further modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains. Reference should accordingly be had to the appended claims in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. In the manufacture of multiwall bags from at least three webs of flexible sheet material, the combination of method steps which comprises: scoring the webs at regular intervals transversely of their length at lines which are to define the end edges of corner flaps of finished bags; then assembling the webs by superposing same in such relation longitudinally that the score lines on the web which is to form the outer ply of the bags are located at positions intermediate the score lines one under ply and those on another under ply; forming the assembled webs into a tube; separating such tube into lengths along lines which include said score lines; and folding inwardly areas at said score lines to form corner flaps, the outer ply of which is of normal length as compared with an under ply thereof of abbreviated length and another of more extended length.

2. A method according to claim 1 for making open mouth bags with stepped bottom corner flaps and in which method the scoring is effected at intervals of two bag lengths, and the tube is separated into bag lengths by separating along lines which include said score lines and also along transverse lines midway therebetween.

3. A method according to claim 1 for making multiwall bags each having an intumed corner comprising a stepped end valve flap and in which method the scoring is effected at intervals of two bag lengths, the tube being separated into bag lengths by separating along lines which include said score lines and also along transverse lines midway therebetween, and the bag lengths each being cut longitudinally for forming two bags, each having one of said valve flaps.

4. In the manufacture of pasted end multiwall bags from at least three webs of flexible sheet material, the

combination of method steps which comprises: scoring the webs at regular intervals transversely of their length at lines which are to define the end edges of the four corner flaps of the finished bags; then assembling the webs by superposing same in such relation longitudinally that the score lines on the web which is to form the outer ply of the bags are located at positions mid-way between the score lines on one under ply and those on another under ply, and with the score lines for two of the corners so spaced that an intermediate ply of the resulting corner flaps will be the longest and the inner ply thereof will be the shortest whereas the score lines for the other two corners will be so spaced that an intermediate ply of the resulting corner flaps will be the shortest and the inner ply thereof will be the longest; forming the assembled webs into a tube; separating such tube into bag lengths along lines which include said score lines; and folding inwardly areas at said score lines to form the four corner flaps, the outer ply of all of which is of the same normal length as compared with an under ply thereof of abbreviated length and another of more extended length.

5. In the manufacture of pasted end multiwall bags from webs of flexible sheet material, the combination of method steps which comprises; scoring the webs at regular intervals transversely of their length at lines which are to define the end edges of the four corner flaps of the finished bags; then assembling the webs by superposing same in such relation longitudinally that each score line on the web which is to form the outer ply of the

bags is located at a position intermediate a score line on one under ply and a score line on another under ply, the score lines being positioned to provide four substantially identical corner flaps except that the score lines on the innermost of said plies for two of the corners are spaced in advance of said intermediate position while those at the other two corners are spaced rearwardly of said position, and the score lines on an intermediate ply for said first two of the corners are spaced rearwardly of said position while those at said other two corners are spaced in advance of said position; forming the assembled webs into a tube; separating such tube into bag lengths along lines which include said score lines; and folding inwardly areas at said score lines to form the four corner flaps, the outer ply of each of which is of normal length, with an under ply thereof of abbreviated length and another of more extended length.

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