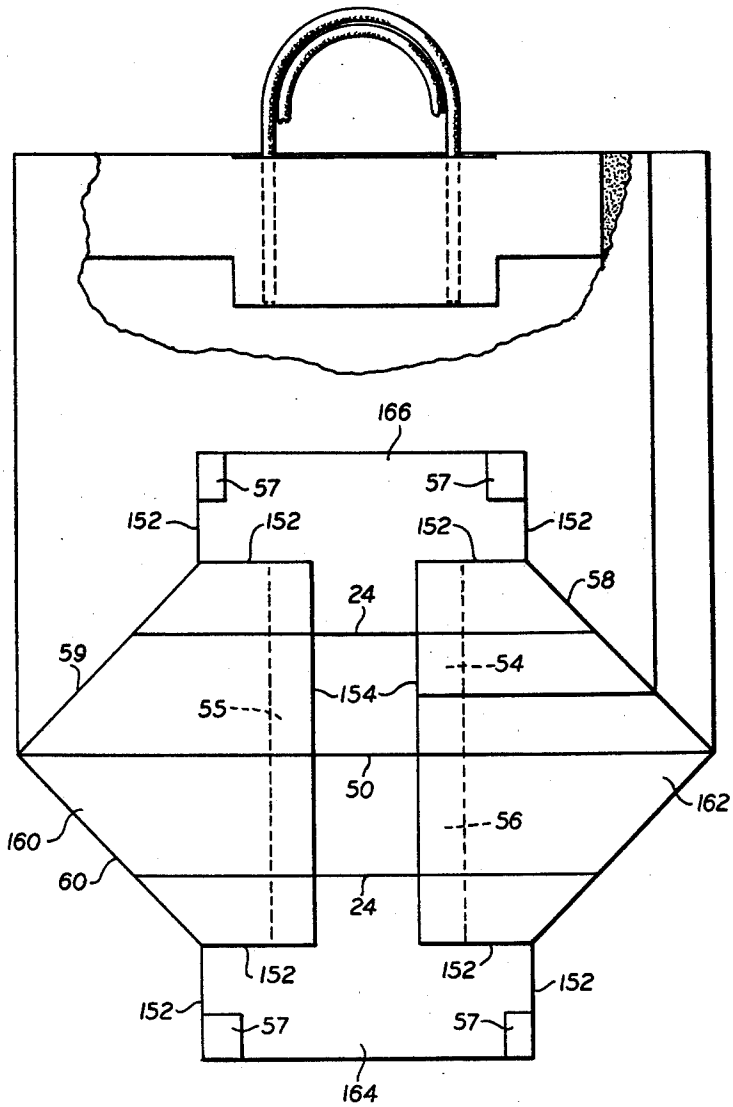
March 19, 1963 H. K. STEEN 3,081,674

METHODS OF MAKING SHOPPING BAGS HAVING REINFORCED TOP AND BOTTOM

Original Filed Sept. 21, 1959 3 Sheets-Sheet 1

FIG. 1.



INVENTOR
HARFORD K. STEEN

BY

Berry & Crews

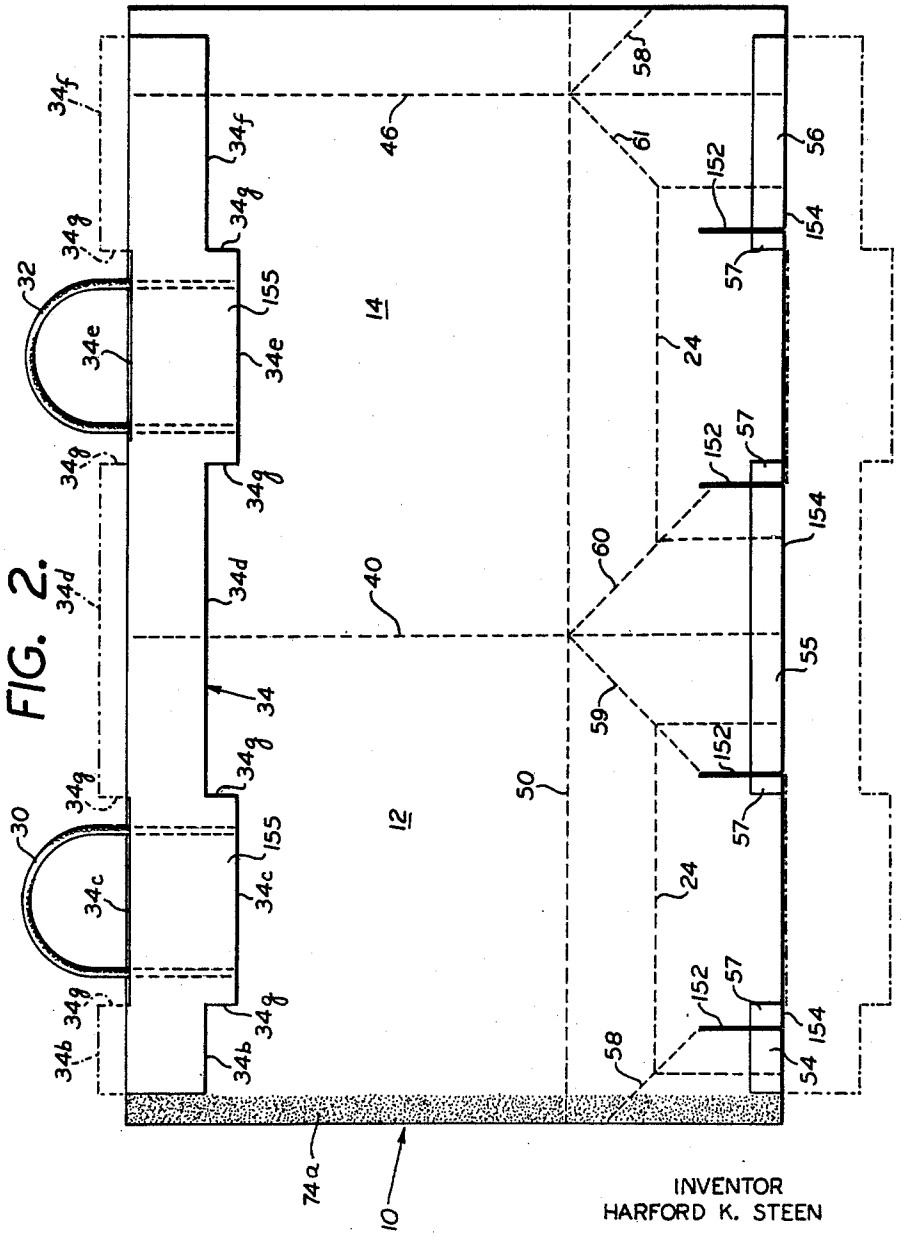
ATTORNEYS.

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FIG. 2.



INVENTOR
HARFORD K. STEEN

BY Berry & Crews

ATTORNEYS.

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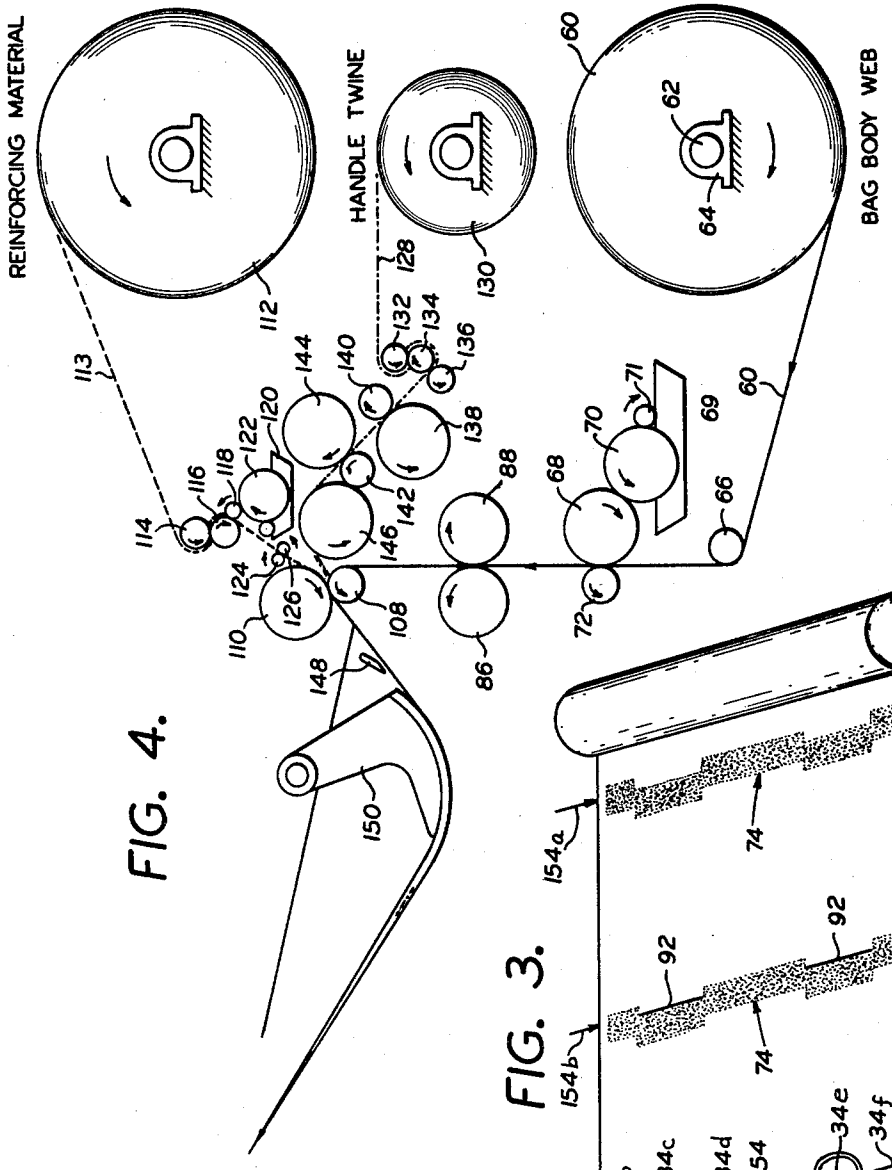


FIG. 4.

FIG. 3.

INVENTOR
HARFORD K. STEEN

BY Berry & Lewis

ATTORNEYS.

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3,081,674

METHODS OF MAKING SHOPPING BAGS HAVING REINFORCED TOP AND BOTTOM

Harford K. Steen, Newburgh, N.Y., assignor to Interstate Bag Company, Inc., Walden, N.Y., a corporation of Virginia

Original application Sept. 21, 1959, Ser. No. 841,273, now Patent No. 3,034,699, dated May 15, 1962. Divided and this application June 22, 1961, Ser. No. 118,966

3 Claims. (Cl. 93—35)

This application is a division of copending application Serial No. 841,273 filed September 21, 1959, which issued as Patent No. 3,034,699 on May 15, 1962.

This invention relates to a novel method employed in the making of shopping bags having handles.

It is a salient object of the invention to provide a reinforcing band within the mouth of the bag whose upper edge coincides with and is adhered to the upper edge of the bag body throughout the portion of the body which is most vulnerable to tearing, such portion constituting a major part of the mouth perimeter.

It is a further object to provide a reinforcing band within the bag mouth which extends down far enough to cover the handles in the handle zones but not nearly so far in the other zones, and in which the material equivalent to that subtracted in the relatively narrow zones is applied as reinforcement to bottom marginal portions of an adjacent bag.

It is a further object to provide a novel method for achieving the above objects at no extra expense of material, with no slowdown of output, and with essentially the same apparatus as before.

The novel bag is broadly of the type disclosed in United States Patent No. 2,060,451, and is adapted to be made by a generally similar procedure through the use of mechanism of the kind disclosed in United States Patent No. 2,060,450. Individual instrumentalities shown in the patents, or their equivalents, are desirably used in the present method, and the machines in their entireties could be used with minor adaptations, but the novel method is illustratively disclosed herein in connection with present day equipment of Interstate Bag Co. Inc. of Walden, New York, in which the bag material is conveyed bottom end first.

According to the patents referred to, shopping bags are made from a web of suitable paper, the bags being of conventional construction, save for the fact that cord or twine handles are attached by adhesion to the inner faces of the opposite sides of each bag in positions to extend outward beyond the mouth of the bag and desirably in nested relation to one another. The adhered ends of the handles are covered by, and are also adhered to, bag reinforcing patches or a bag reinforcing band.

The problem of making bags of this kind economically through the use of high speed machinery has been solved according to the above patents by first forming, at blank length intervals, aligned transverse slits in the handle zones of the body web to effect partial severance, then applying the handles to the web below the slits but so that they extend upward across the slits, and then, after tubing, completing the severance without cutting through the handles by effecting supplementary partial cuts in alignment with each aligned pair of slits.

Reinforcing patch material was originally fed from reels, coated with paste in appropriate locations for adhesion to the cord handles, cross perforated at intervals corresponding to the patch height, and applied to appropriate paste covered areas of the body web along with the cord handles, each patch being snapped free of the

patch web as it entered the grip of the body feeding rollers.

According to the preferred modern practice, however, instead of supplying two webs of patch material, each of a little more than handle zone width, a single web of patch material has been supplied, wide enough to produce bands that extend completely around the inner face of the bag mouth except for the width of the longitudinal seam where the overlapped seam material already provides double thickness and therefore requires no further reinforcement.

The reinforcing band thus provided within the bag mouth has served to oppose the extension into the body of tears which originate at the mouth of the bag. It has been made of uniform width and length, being rectangular in shape. The reinforcing band has been of sufficient width to extend down below the lower ends of the handle, the width in a typical case being of the order of three inches in a bag blank whose total length is of the order of twenty-two inches.

The practice has been to apply the band with its upper edge evenly disposed below the preliminary slits and the line of the supplemental cuts by a safe amount, say one-quarter to one-half inch. If the patch extended above the top of the bag throughout the length of the patch, it would be impossible to cut it off without drawing the patch out, and it would, therefore, have been impossible to have a continuous successful operation of the machine. The construction described has proved very satisfactory, and bags of this kind have been made and sold, and are being made and sold, in large quantities.

These bags have been subject to the drawback, however, that a narrow, unreinforced, single ply margin is left along the bag mouth, the region of greatest vulnerability to tearing. Tears started at the mouth extend through this single ply margin, and while they are arrested and limited by the reinforcing band, the short tears detract materially from the appearance of the bag.

It has been found, moreover, that while the full width of the band is required in the handle zones, a portion of this width can be dispensed with in other areas without substantial impairment of the bag. There is no point, of course, in eliminating a portion of the band only to waste the removed material, but I have found that by severing the reinforcing web along an irregular boundary to provide the full depth in the handle zones and a lesser depth in the other zones, strikingly advantageous results can be realized at no added expense of material, at the same rate of output, and with the use of essentially the same machinery as before.

By severing the reinforcing web between band units along irregular lines of a properly chosen pattern material may be subtracted from the lower margins of one band outside the handle zones and added as protruding strips along the upper margin of the next adjacent band. The band unit thus provided is applied to two adjacent blank lengths of the body web to extend across the lines of the supplemental cuts with the protruding strips along the upper margin adhered to bottom marginal portions of the next blank length of the web.

The primary advantage of this invention lies in the fact that the material of the strips which cross the lines of severance between blanks is severed with the body material of the bag and therefore necessarily terminates flush with the body material at the mouth of the bag. Since the adhesive is applied continuously to the bag web throughout these areas, the body material is reinforced to the very edge of the mouth, and hence tears cannot even be started under any ordinary conditions.

The secondary advantage of the novel procedure is that the material which laps over onto the bottom mar-

ginal portions of the adjacent blank forms important reinforcing strips in the areas of the bottom margins which extend across the bottom of the bag, that is in the very regions in which failure of unreinforced bag bottoms is most likely to occur.

With the notched band, the patch at the handle can be set to align the notch bases completely at the top. Any small variation, up or down, will not affect the operation because the patch is cut through at the top with the rest of the bag and the pre-slit would make no difference at the handle and cause no noticeable defect in appearance, even if it climbed an eighth or quarter of an inch above the top or below the top at that point. Therefore, the entire top, even the patch and handle, would present a much neater appearance inside and outside the bag than does the present straight patch or reinforcement.

Other objects and advantages will herein appear.

In the drawing forming part of this specification,

FIG. 1 is a view in elevation partly broken away of a nearly completed illustrative bag embodying features of the invention.

FIG. 2 is a plan view of the inner side of a complete, unfolded blank of FIG. 1 with the handles and reinforcing materials attached, fragments of the two involved reinforcing band units, as originally applied but later severed, being shown in broken lines;

FIG. 3 is a fragmentary diagrammatic view showing the body web at successive stages of advance, the line of the supplementary cuts being indicated by arrows in three instances, and actually drawn in in one instance as they will be located after tubing; and

FIG. 4 is a view in side elevation showing diagrammatically the progress of the bag making operations through the preslitting, pasting of the body web, and the applying of the handles and the reinforcements.

The bag of the present invention, as has been noted, is generally like the bag of United States Patent No. 2,060,451. The known structure will, therefore, be described briefly, the chief emphasis being reserved for the features of novelty. The same thing is true of the method.

If the nearly completed bag of FIG. 1 were opened along its side seam and fully unfolded, the inner face would be presented to view as shown in FIG. 2. The blank **10** would comprise body panels **12** and **14** running from the upper edge of the blank down to a transverse fold line **24**. Twine handles **30** and **32** have their end portions adhesively secured between the body panels **12** and **14**, respectively, and a reinforcing band **34** which extends almost completely around the inside of the bag.

The portions of the blank lying below the fold line **24** constitute the bottom-forming material. Longitudinal fold lines **40** and **46** extend through the bottom material and the body material from end to end of the blank.

The bottom is also provided with diagonal fold lines **58**, **59**, **60** and **61**, which extend across the fold line **24** into the body area. The bottom is in all respects conventional, save that reinforcing strips **54**, **55** and **56** and small tabs **57**, derived from one of the band units **34***a*, as will be fully explained, are adhered to extreme marginal portions of the bottom.

In the normal manufacture of bags of this class, the handles **30** and **32** are attached to the bag body, in part by direct adhesion, and in part through individual patches or through a common reinforcing band. The prior art band is like the band **34**, but has continuous straight parallel upper and lower edges, so that it is of rectangular configuration. Successive bands are cut from the leading end of a web of reinforcing material, the area of the material devoted to each band being obviously the product of the width of the web by the distance that the web is advanced in a cycle.

It is usual first to apply adhesive to the body web in the locations to which the reinforcing transverse band and the handles are to be applied, then to slit the web along transverse slit lines located in the handle zones but spaced slightly from the adhesive and then to apply handles together with the reinforcing band so that the handles cross the slits. The slits extend completely across the handle zones and short distances beyond them so that each bag length can be separated from the web after the application of the handles and the tubing of the leading blank length, by a supplementary partial severance confined to zones which are clear of the handles. The second or supplementary partial severance lines are caused to align substantially with the slits, and to overlap the slits slightly. If they are not quite in alignment, they are at least parallel and in close proximity to one another so that the paper between the lines can be broken through readily without starting general tears.

In the present instance this practice is generally adhered to, but it is changed in important particulars with the result that important new advantages are realized. The procedure involved in the manufacture of the bag of FIGURE 1 is clearly disclosed in FIGURES 3 and 4. The illustrative form of mechanism employed is largely like that of Patent No. 2,060,450, although there are specific differences. Details of the various operating instrumentalities are adequately shown and described in said patent, and since the present invention has to do with the method and product, rather than with the apparatus, the apparatus is illustrated herein in a realistic but purely diagrammatic manner. Reference may be had to Patent 2,060,450 for a detailed illustration of instrumentalities suitable with minor and obvious adaptations for carrying out the procedure described and claimed herein.

A roll **60** of bag material is mounted in the usual way on a rod **62** which is rotatably supported in bearings **64**. The paper web **60** is fed at constant speed around a guide roller **66** and thence past a paste applying roller **68**. The roller **68** is supplied with paste from a pan **69** by a pickup roller **70**. A doctor roller **71** limits the thickness of the paste film on the roller **70**. An impression roller **72** is opposed to the roller **68**. The roller **68** applies transverse paste stripes **74** of irregular shape at bag length intervals to the inner faces of the web **60**. The paste stripes **74** are used for securing reinforcing band units **34***a* to the inner face of the web **60**. The shape and dimensions of the stripes at **74** are substantially the same as the shape and dimensions of band **34***a*, but the paste area is desirably limited so that when the band is pressed out the paste will terminate a little short of the edge boundaries of the band unti **34***a*.

After passing roller **68**, the web **60** travels past a roller pair **86**, **88**, located at a slitting station. The roller **86** carries a male cutting member which acts in cooperation with a female cutting member of the opposed roller **88**. The cutting members form two aligned transverse slits **92** which extend across and beyond the longitudinal zones of the web **60** in which the handles **30** and **32** are to be applied. The slits **92** are caused to clear the paste stripes **74** by a small amount, just enought to assure that the slit cutting members will not come in contact with the moist paste on the web.

The paper for forming reinforcing band units **34***a* is supplied in the form of a web **113** from a reel **112** over the upper roller **114** of a draw roller pair **114**, **116**. The web passes between rollers **114** and **116** and then between roller **116** and a paste applying roller **118**. Roller **118** applies stripes of paste in four narrow zones which are destined to come into contact with the attached ends of the handles **30** and **32**, so that there will be adhesion of the handle ends to the band **34** as well as to the body material **60**. The paste is supplied from a pan **120** to roller **118** by a pickup roller **122**.

After leaving the rollers **116**, **118**, the web **113** passes between perforating and slitting rollers **124**, **126**. The rollers **124**, **126** form perforated transverse easy tear lines which are later to be divided to form the edges **34***b*, **34***c*, **34***d*, **34***e* and **34***f*, and longitudinal slits which form

edges 34*g*. The perforated transverse lines which are to define the edges 34*c* and 34*e*, are disposed in alignment with one another and extend only across the handle zones, while the perforated transverse lines which are to define the edges 34*b*, 34*d* and 34*f*, are also disposed in alignment with one another, but at a substantial distance behind 34*c* and 34*e* of the order, say, of one inch in a band unit whose extreme length is of the order of four inches, and whose average length is of the order of three inches. It will be apparent that the altered shape of the band unit does not increase the consumption of reinforcing paper, and that it does not involve any waste of material, the material notched out of the leading margin of one band unit being left as integral, protruding strips on the trailing end of the preceding band unit. The irregular band pattern of the present bag requires an altered pattern of the perforating and cutting means and of the rollers **124**, **126**, themselves, as compared with the corresponding rollers and the cutting means for forming the continuous, straight, perforated, transverse cut of the prior art, but the prior art machine requires only the substitution of perforating rollers **124**, **126** with their cutting instrumentalities for the corresponding structure already present. The new paste pattern is supplied by an equally simple substitution of a paste supplying roller **68** of suitable pattern.

After leaving the rollers **124**, **126**, the web **113** has the handles **30** and **32** applied to it and, simultaneously with such application, it and the handles enter the nip of rollers **108**, **110**, for application to the paste moistened areas of the web **60**. The rollers **108**, **110** travel at a much higher peripheral speed than the feed rate of the web **113** (the ratio being the same as that of the length of the bag blank to the average lengthwise extent of the band unit 34*a* as seen in FIG. 2). As soon as the web **113** enters the nip of rollers **108**, **110**, the partially severed band at the leading end of the web **113** is pulled asunder or snapped off along the easy tear lines 34*b* to 34*f*.

The handle twine **128** is fed from two reels **130** (one shown) through draw rollers **132**, **134** and **136**, thence between cut-off rollers **138** and **140**, and pinch segment rollers **142**, **144** to a handle forming cylinder **146**. The cylinder **146** is equipped with handle formers which form handles and deliver them with their cut ends leading between the webs **60** and **113** on the rollers **108**, **110**. The band unit **34** extends almost completely across the web **60** but does not run into the longitudinal seam area.

The band-and-handle-equipped web **60** continues forward past a paste nozzle **148**, which applies a continuous stripe 74*a* of paste for forming the longitudinal seam, and passes thence to a tuber **150**.

After the tube has been formed, longitudinal slits **152** are made in the bottom area and straight transverse cuts **154** are made in the superposed layers of the bag material. Successive lines of severance are indicated by arrows 154*a*, 154*b* and 154*c* in FIGURE 3. The cuts **154** indicated at 154*c* in FIGURE 3, are, in fact, not made until after the leading blank length has been tubed.

It is a primary feature of the invention that the straight transverse supplementary cuts **154** extend not only through the material of the bag web **60**, but also through portions of the band unit 34*a* which are located just above the band unit edges 34*c* and 34*e*. By this procedure the band unit 34*a* is divided on the one hand into the band **34** which is adhesively attached to the mouth area of one blank length, and the reinforcing strips **54**, **55** and **56** and the tabs **57**, which are adhesively attached to the leading, bottom marginal area of an adjacent bag blank.

The point is most strongly emphasized that by this procedure the upper edges of the band **34** along the severance lines **154** are necessarily made coincident with the upper edges of the body panels **12** and **14**, and that the adhesive union of band **34** with body panels **12** and **14** is maintained right up to the common boundary.

As an added or supplementary feature, the band **34** includes tongues or tabs **155** in the handle zones which extend downward beyond the handle ends, but are of reduced width in the other zones where the full width of the band is not required for reinforcing purposes. The material omitted at the narrowed zones is not wasted, but forms the strips **54**, **55** and **56** for reinforcing the bottom of the adjacent bag blank.

As will be apparent from an examination of FIGURE 1, one wall of the tube is folded away from the other along a transverse fold line **50**, the pentagonal end panels **160** and **162** being simultaneously drawn inward and folded down flat as shown in FIGURE 1. It is apparent that the strip **55** extends along the vertically disposed margin of panel **160** of FIG. 1, and that the strips **54** and **56** extend end to end along the vertically disposed margin of the panel **162** in FIG. 1. It is clear therefore that when the lower tongue **164** is folded upward along the lower segment of fold line **24** and the upper tongue **166** is folded down along the upper segment of fold line **24**, and the parts are adhesively united according to conventional practice, the strips **55** and **54—56** will extend completely across the bottom of the bag in parallel relation to one another, and that they will afford important reinforcement for the bottom. As a matter of fact, the reinforcing strips **55** and **54—56** are doubled over at the ends so that in these regions not just one reinforcing ply, but two such plies, are provided.

While a non-gusseted bag has been illustratively shown and described herein, it will be appreciated that the invention is not limited to non-gusseted bags but is useful in any type of bag which has handles extending beyond the mouth of the bag and which requires reinforcement along the upper margins of the body.

The procedure has been specifically described with reference to a procedure in which the bottom ends of the bag are the leading ends, but it will be readily appreciated that the invention is, in fact, broad enough to cover a procedure in which the upper or mouth ends of the bag are the leading ends.

While a certain preferred embodiment of the invention has been illustrated and described in detail, it is to be understood that changes may be made therein and the invention embodied in other structures. It is not, therefore, the intention to limit the patent to the specific construction illustrated, but to cover the invention broadly in whatever form its principles may be utilized.

I claim:

1. The method of making a handled shopping bag with mouth and bottom reinforcements which comprises, in combination, applying unbroken transverse paste stripes at blank length intervals to a continuously moving web of bag material with first extension strips in the handle zones which protrude in one direction and second extension strips between the handle zones which protrude in the opposite direction, forming preliminary transverse slits in the handle zones between the second extension strips and in line with the base portions thereof, which slits define in part the eventual line of severance between blank lengths, applying looped handles to each blank length in the handle zones with their ends adhered to one blank length and their bodies extending freely across the slits and over an adjoining blank length, concurrently applying a transverse reinforcing band of substantially the same irregular shape and substantially the same area as the paste stripes and having corresponding first and second extension strips, in position to cause the main body of the band to cover the handle ends and the paste moistened area of the mouth portion of one blank length, and the second strips to cover the second extension strips of paste on the next following blank length, then, after tubing, severing the leading blank length along supple-

mentary partial lines of severance which are complementary to, and in substantial alignment with, the preliminary slits, and which pass through the base portions of the second band strips, with the result that the band material is severed at one operation with, and in coincidence with, the bag material, causing the mouth of the leading blank length to be reinforced to its very edge in the zones between handles and the bottom of the next following blank length to be reinforced to its very edge in the zones between handles.

2. The method of making a handled shopping bag with mouth and bottom reinforcements as set forth in claim 1 in which the reinforcing band units are succesively cut and detached from the leading end of a web, so that the lower edge of one band is exactly complementary to the upper edge of an adjoining band, there being no waste of band material and no greater consumption of material

than would be required in a rectangular band of sufficient depth adequately to cover the adhered handle ends.

3. The method of making a handled shopping bag with mouth and bottom reinforcements as set forth in claim 1, in which the bottom of the bag is formed after severance of the web, and tubing of the blank so formed with opposed portions of the blank infolded to form end panels, the cut edges of which run at right angles to the face of the bag and for the width thereof when expanded, such cut ends containing said second band strips, which thus run along the margins of the infolded panels crosswise of the bag and serve to reinforce same.

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