

W. S. BLIZARD

METHOD OF PRODUCING PAPER BAGS

2 Sheets-Sheet 1



FIG. 1.

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2 Sheets-Sheet 2

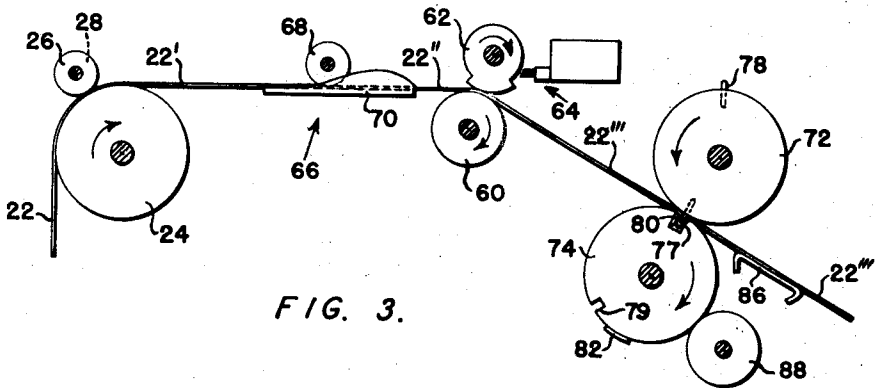


FIG. 3.

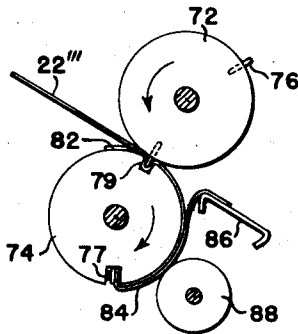


FIG. 4.

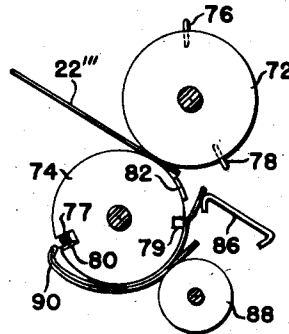


FIG. 5.

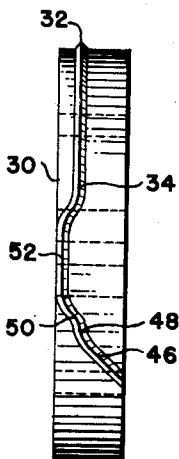


FIG. 7.

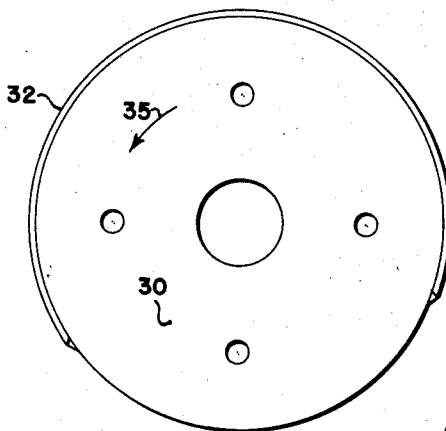


FIG. 6.

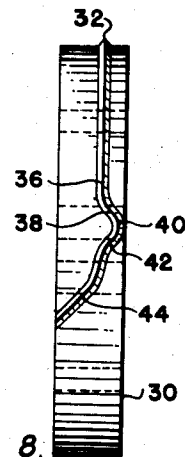


FIG. 8.

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METHOD OF PRODUCING PAPER BAGS

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This invention relates to paper bags and more particularly to the formation of a blank used in the manufacture of a paper bag or envelope.

It has been the practice of manufacturers of hosiery when packing the hosiery, for example, when packing a dozen pairs of stockings in a box, to wrap each of the stockings around a piece of paper or cardboard with rounded corners to hold them in flat form as they are placed in a box and to facilitate their removal from the box singly by the retailer.

More recently the practice has been to wrap the stockings around a paper bag, thus providing a bag into which the stocking may be placed by the retailer after being shown to the customer and providing a convenient carrying bag for the customer. The trade has encountered difficulties in this practice in that the sharp outside corners of the conventionally formed paper bag would frequently catch or snag the threads in fine hosiery. It has become necessary, therefore, for manufacturers of the paper bags to run the bag through an additional operation after the bag is completely formed wherein the pointed corners of the bag are sheared off to produce corners of rounded form to eliminate the sharp points which frequently caused damage to the stockings as the stockings were removed from around the bag.

It is an object of the present invention to provide a paper bag which as formed from the blank will have rounded corners.

It is a further object of the present invention to provide successively, from a strip or web of paper, bag blanks which when formed into bags will produce bags which have rounded corners.

These and other objects of the invention will become apparent from the following description when read in conjunction with the accompanying drawing in which:

Figure 1 is a plan view of a bag blank formed in accordance with the present invention;

Figure 2 is a back view of a bag formed from a blank such as is shown in Figure 1;

Figure 3 is a schematic showing of a portion of a bag forming machine;

Figures 4 and 5 are showings of a portion of the machine shown in Figure 3 in successive operating positions;

Figure 6 is a front view of a chip cutting roller;

Figure 7 is a side view of the left side of the chip cutting roller as viewed in Figure 6; and

Figure 8 is a side view of the right side of the cutting roller as viewed in Figure 6.

Referring to the figures there is shown a bag having a rear panel 2, a front panel 4, a closing flap 6 and side flaps or side seams 8. The boundary between the front and rear panels is defined by the construction line 3 which represents the bend line from the bottom of the bag when the bag is formed with the front and rear panel substantially in the adjacent portion

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and with the side flaps 8 folded over on the bend lines 9 and sealed to the rear panel 2 to form a finished bag. While for convenience the bag will be referred to herein as being constructed of paper, it will be apparent that the bag may equally well be constructed of fabric or plastic material, or of materials such as "cellophane" and the like.

The upper portion of the front panel 4 has outer corners formed by the curved portions 10 which merge into the curved portions 11 which are of a form coincident with portions of the circumferences of the small circles 15 shown in construction lines. The construction line 13 is a line extending transversely of the bag joining the centers of radius of each of the two construction lined circles 15. The construction line 14 represents the score line on which the closing flap is folded to close the bag opening of the finished bag as shown in Figure 2. It will be noted that this score line crosses the edges of the bag in regions of the curvatures 11. Thus the bend line crosses the edge of the bag blank in a region where the edges of the bag blank are not parallel to each other and are of concaved form with respect to the edges of the bag blank. The curved portions 10 of the bag blank provide the rounded upper corners of the finished bag as shown generally at 12 in Figure 2 when the bag closing flap has been folded down. It will also be noted that the intersection of the bag flap bend line with the edges of the bag in the vicinity of the concaved or curved side portions 11 provides the completely rounded corners 12 which extend to the edge of the flap 4 and avoid the existence of an edge at the bend line of the flap which could possibly snag the threads of even the finest hosiery. The spacing between the line 13 and the line 14 will be preferably approximately one-sixteenth of an inch and the radius of the curvature 11 must be such that the line 14 will cross the edge of the blank in the region of this curvature.

The edges of the blank from which the bag is formed have in the vicinity of the bend line 3 the notches or indentations shown generally at 14. It will be noted that these indentations are formed with the arcuate base portions 16 which are portions of the edges of the bag blank lying coincident with the circumference of the small circles 17 shown in construction lines and having their centers joined by the transverse construction line 19. Adjacent to the curved portions 16 are the curved portions 20 and 21. The bend line 3 is displaced from the construction circle center line 19 by approximately one-sixteenth of an inch. While this displacement is shown in Figure 1 as being above the line 19, it should be noted as will be hereinafter described more fully that this displacement could be equally well selected to be below the construction line 19.

The essential considerations are that the displacement of the bend line 3 is approximately one-sixteenth of an inch from the bend line 19 and the displacement of the bend line 13 is also approximately one-sixteenth of an inch from the bend line 14 and that the arcuately concaved edges 11 and 16 are of a sufficient extent that displacement of the bend lines within one-sixteenth of an inch in either direction will not carry the bend lines more than a limited extent beyond the regions of the curved edges 11 and 16.

As will become clear from the discussion contained hereinafter, the dimension between the bend line 13 and the bend line 3 is a fixed dimension and for most bags the one-sixteenth of an inch dimension affords ample space for normal manufacturing tolerances which may result in displacement of these bend lines without carrying either of the bend lines too far beyond their associated construction line. This formation of the edges of the bag blank in the region of the bend line 3 results in a bag having the rounded lower corner 18 as shown in Figure 2 and the arcuately concaved portions 16 of the edges of the bag affect the complete avoidance of any sharp corners at the bottom bend line of the bag when the bag is finally formed.

When the blank as shown in Figure 1 is formed into a finished bag, the side flaps or side seams 8 are adhered to the inside of the back of the bag thus there is avoided the possibility of catching the threads of the stockings on any portion of the side seams when the stockings are wrapped around the bag.

The formation of the present bag is accomplished by use of a conventional bag forming machine of a type well known to the art, the essential portions of which are shown diagrammatically in Figure 3. In such a machine, the strip or web of paper 22 is fed from a supply roll not shown and passes over a roller 24 which mounts a pair of side chip cutting discs, one of which is shown in Figures 6, 7 and 8. The other disc of the pair would obviously be of the opposite hand inasmuch as each disc cuts one of the sides of the paper strip to form the side contours of the bag blank. Working against the knife edges of the cutting discs are the anvil rollers 26 and 28.

Heretofore, the chip cutters have been formed from a roller having bolted to one front face thereof a sheet of steel of slightly greater diameter than the roller extending for a sufficient portion of the circumference of the roller and having its end portions bent outwardly from the face of the roller in order to leave uncut the portion of the paper strip which is to become the side seams of the bag. While this construction was entirely satisfactory for forming the bends cut at 46' and 44' in the bag blank, this type of cutting blade cannot be formed so as to make cuts of the radius shown at 11 and 16 of the bag blank in Figure 1.

Referring to Figures 6, 7 and 8, there is shown a disc 30 which has formed on its surface a hardened knife edge 32 which extends around the disc 30 for a portion of its circumference. As the paper strip is passed through the machine, it is cut so as to form successively the back panel 2 of the bag front panel 4 and the closing panel 6 of the bag.

The cutting disc shown in the figures is the disc used to cut the right hand side of the bag blank shown in Figure 1. The disc is rotated counter-clockwise as shown by the arrow 35 in Figure 6.

The portion of the cutting edge extending from the location indicated by the numeral 34 and extending upwardly and around the roller to approximately the location indicated by the numeral 36 is used to cut the chip from the bag back panel within the portion of the blank bounded by the numerals 34' and 36' in Figure 1. The portion of the cutting edge in the vicinity of the numeral 38 will cut the curved portion 21 of the bag blank, the portion 40 of the cutting edge will cut the radius portion 16 of the bag blank, the portion 42 of the cutting edge will cut the curved portion 20 of the bag blank, and the portion of the cutting edge 44 will cut the bevelled end 44' of the side flap 9 of the front of the bag front panel. The width of the strip of paper fed into the machine is selected to be equal to the width of the bag front panel 4 and its associated side flaps 8, thus the cutting edge of the chip cutter passes off the paper somewhere beyond the location on the cutter indicated by the numeral 44 and returns on the paper in the region of the numeral 46 which serves to cut the bevelled end 46' of the front of the upper portion of the side flap 8. The portion 48 of the cutting edge serves to cut the curved portion 10 of the bag blank, the portion 50 of the cutting edge serves to cut the arcuate edge portion 11 of the bag blank, the portion of the cutting wheel 52 cuts the straight edge of the flap 52', and thereafter the cutting edge at location 34 again begins to cut the edge of the back panel of the next successive bag at a position indicated at 34'' of Figure 1.

Thus it will be apparent that with a chip cutting roller such as shown in Figures 6, 7 and 8 mounted on the end of the roller 24 in Figure 3 toward the viewer and with a chip cutting roller of reverse formation mounted on the end of the roller 24 away from the viewer the paper strip 22' leaving the roller 24 will have the side formation of the bag blank shown in Figure 1. The continuation of the strip is indicated by the construction lines 34'' and 52'' in Figure 1. The edge 56 of the flap and the edge 58 of the bag back are cut out at a later operation which will be hereinafter described, thus the strip 22' is still a continuous strip having a side formation resulting from the removal of the side chips from the edges of the paper strip by the two chip cutting rollers.

There is shown generally at 66 in Figure 3 a conventional mechanism for folding the side flaps or side seams 8 inwardly on the bend lines 9. This apparatus includes a pair of guide rollers 68 and curved metal guide members 70 as are well known in the art and results in forming the side seams 8 which are outstanding in the portion of the strip indicated as 22' causing them to be folded over on the strip in the portion of the strip indicated at 22''.

The paper strip 22'' is fed over the roller 60 whereupon the extended portions of the roller 62 serve to spread a suitable adhesive on the folded side seams 8. The extended portions of the roller 62 with each rotation thereof are moistened with a suitable adhesive by a conventional adhesive dispenser as indicated at 64. It should be noted that subsequently when the bag is formed the side seams 8 will adhere to the inside of the back panel 2 of the bag as shown in Figure 2.

The strip 22''' is then fed through the bag forming rollers 72 and 74. The roller 72 includes the two extending blade portions 76 and 78 and the roller 74 includes the slotted portions

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77 and 79 which are adapted to receive the extended blade portions 76 and 78 respectively of roller 72. The slot 77 contains a spring loaded clamp bar 80. The roller 74 also includes the cutting member 82 which, as hereinafter described, serves to sever the successive bag blanks from the strip forming the edge 56 of the back closing flap and the edge 58 of the bag back panel.

The paper strip 22''' is fed between the rotating rollers 72 and 74 and as the rollers rotate the extending blade 76 presses a portion of the paper strip into the slot 77 wherein it is clamped by the spring loaded bar 80 and as the roller 74 rotates carries with it the double folded strip as indicated generally at 84 in Figure 4. The bend in the bag blank formed in the slot 77 is the bottom fold or bend line 3 of the bag as shown in Figure 1.

The tray 86 is provided as a support for the extended end of the strip 22''' in Figure 1 and provides an edge about which the strip is drawn as the strip is folded as shown in Figure 4. A pair of rollers 88 are adapted to bear against the edges of the strip as the bag is being formed against the roller 74 in order to press the side portions of the bag back panel 2 against the adhesive coated folded in side seam portions 8. As the rollers 72 and 74 continue to rotate the extended blade portion 78 of roller 72 engages the slot 79 of roller 74 and presses the strip into the slot providing the score line 14 across the bag blank thus locating the bend line 14 of the bag closing flap.

As the roller 74 continues to rotate the cutting blade 82 comes in contact with an anvil portion of the roller 72 and cuts the edge 56 of the bag closing flap thus severing the formed bag from the strip 22''' and at the same time cutting the edge 58 of the bag back of the next succeeding bag blank. By means of a cam release mechanism not shown, the spring bar 80 is moved to release the lower end of the bag, as shown generally at 90 in Figure 5, and the finished bag drops to a conveyor mechanism not shown whereby it is carried from the machine and the rollers 72 and 74 continue their rotation immediately commencing the formation of the next succeeding bag.

It will be appreciated that the bag forming apparatus described herein is a conventional type of bag forming machine well-known to the art which has been modified by means of the chip cutting wheel described in connection with Figures 6, 7 and 8 in order to produce a bag blank such as shown in Figure 1. It will also be appreciated that the arrangement of the sequence of operations, namely the chip cutting, the side seam forming, the application of adhesive, the formation of the bag, and the severing of the bag from the strip may be modified without departing from the invention as set forth herein relating to a method of cutting a bag blank to provide a finished bag which will not have the pointed corners hereinbefore described.

Referring to the roller 72, it will be observed that the extended blade portions 76 and 78 establish a fixed and constant dimension between the bend lines 3 and 14 of the bag and while these two bend lines may vary slightly in position with respect to the lines 19 and 13, it will be apparent that variation with respect to each of those lines will be the same. The one-sixteenth of an inch dimension provided by the blank shown herein as being the limit of the displacement of the line 14 upwardly or the line

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3 downwardly has been found to be adequate for the normal operation of the type of machine referred to herein.

By means of this blank formation there is produced a finished bag which does not have the sharp outer corners of the conventionally formed bag. Particular merit lies in this blank formation in view of the fact that the rounded corners are maintained in the finished bag even though the actual location of the lower bend line may vary over a considerable extent. This method of providing rounded corners has the great advantage over the method used heretofore, namely, employing a shearing operation after the bag is formed with square corners to effect the removal of the square corners and the replacement thereof with rounded corners. Such operations on paper bags which are produced in large quantities add greatly to the cost of manufacturing the bags. This additional cost is entirely avoided by the manufacture of bags in accordance with this invention.

It will be appreciated by one skilled in the art that this invention may be incorporated in a bag of the side fold and center seam variety, and that various modifications may be made in the embodiment of the invention enclosed herein such as in the formation of the curvatures of the side portions 16, 20, 21, 10 and 11 of the bag blank without departing from the scope of the invention as set forth in the following claims.

What is claimed is:

1. The method of producing bags comprising cutting a strip of material to form a succession of bag blanks and cutting contoured indentations in the edges of the strip in the regions thereof in which the top and bottom corners of each bag will be formed, the indentations each being in the form of a concave surface joining at least one convex surface extending inwardly of the portion of the strip which is to form the finished edge of the bag, folding each blank with the bend lines extending transversely across the top and bottom of the bag and terminating in concave surfaces of said indentations and displaced from the bases thereof, and sealing the blanks to form finished bags.

2. The method of producing bags comprising cutting a strip of material to form a succession of bag blanks and cutting contoured indentations in the edges of the strip in the regions thereof in which the top and bottom corners of each bag will be formed, the indentations each being in the form of a concave surface joining at least one convex surface extending inwardly of the portion of the strip which is to form the finished edge of the bag, folding each blank with the bend lines extending transversely across the top and bottom of the bag and terminating at or generally adjacent to points of tangency of each of said concave surfaces and an adjacent convex surface, and sealing the blanks to form finished bags.

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