METHOD OF MAKING BAGS FOR SOUND RECORDS

Filed June 5, 1941

INVENTOR
GEORGE W. POPPE

ATTORNEY
This invention relates to a bag for holding sound record discs and to a method for forming such a bag.

The object of the invention is to produce a bag for holding sound record discs which can be produced on a bag machine at high speed.

Another object is to produce a bag of this type which is almost exactly similar in appearance to envelopes now generally used for sound records.

A further object is to produce a bag for sound records by a method which lends itself to production on a bag machine at one continuous operation, the bag being produced complete from a roll of paper.

A feature of the invention resides in the manner of cutting and folding the web of paper and in subsequently cutting the walls of a tube formed from the web, to produce bag tube sections, the tops and bottoms of which are of the shape desired in the finished product.

Further features and advantages will become apparent from the following description and claims when taken in connection with the accompanying drawings in which:

FIG. 1 is a schematic side elevation of a bag machine.
FIG. 2 is a diagrammatic top plan view showing the manner in which the web of paper is folded into a bag tube and cut into bag tube sections.
FIG. 3 is a perspective view of the cutter and a portion of the cylinder.
FIG. 4 is a finished bag.
FIG. 5 is a sketch along the line 5-5 of FIG. 4.
FIG. 6 is a view similar to FIG. 2 but showing a somewhat different form of convex cuts which are made in the web.
FIG. 7 is a perspective view similar to FIG. 3 but showing a slight modification of the cutter.
FIG. 8 is a complete bag in which the cuts in the web are made as shown in FIG. 6, and with the cutter modified as shown in FIG. 7.
FIG. 9 is a section on the line 8-8 of FIG. 8.
FIG. 10 is a bag tube section formed by omitting the die 12 and the cutter 66.
FIG. 11 is a completed bag formed from a bag section such as shown in FIG. 10, and FIG. 12 is a view similar to FIGS. 2 and 6 showing a further modification, FIGS. 13 and 14 being detailed.

Sound record envelopes as herefore generally made require the use of a blank, the end edges of which are differently cut. The blanks are then separately fed to mechanism which folds each blank at about its middle and pastes the side edges together. Such a method is slow compared to the speed at which the bag of the present invention may be made.

The advantage resulting from the present method will best be understood by describing the method in connection with a bag machine by which it may most economically be practiced in commercial production.

The bag machine in FIG. 1 is a well known type and therefore some parts not directly concerned with the present invention are omitted, such as details of the driving mechanism and transmitting connections, as these are of the usual type.

The paper from which the bags are to be produced is supplied from a roll 2, supported on a shaft 3, carried by suitable framework constituting a support for the bag machine mechanism.

The web of paper from the roller 2 passes over guide rollers 4, 5, and 6, supported on suitable shafts having their bearings in the side frames of the machine. From the guide roller 8, the web passes over the hardened steel roller 8, where it receives a pair of diagonal cuts 36, FIG. 2. These cuts are produced by suitable dies one of which is indicated at 9. These dies are not shown in detail because they are of well known construction and are shown in greater detail in my Patent No. 1,798,168, March 31, 1931. After receiving the diagonal cuts, the web passes over a second hardened steel roller 10 where it receives cuts from a die 12. This die may be shaped to make a cut such as that shown at 57 in FIG. 2 or a cut of the shape shown at 38 in FIG. 6. The cuts 57 or 38 are convex cuts, the convexity being in the direction of the feeding movement of the web.

After receiving the diagonal cuts and the convex cuts, the web passes under the former 16 and is folded over onto the top of the former to form a bag tube. As a tube, it passes between feed rollers 18 which feed rollers pull the web from the roll 2 and push it forward into engagement with pinch bar mechanism consisting of an upper pinch bar 20 and a lower cylindrical roller 21.

Power to drive the machine is applied to the shaft of the roller 21 which shaft carries a sprocket wheel 22. A sprocket chain 23 passes over the sprocket 22 and over another sprocket 24 carried by a shaft 25, by which power is transmitted to the shaft 26 and 27 carrying the dies 9 and the die 12. For this purpose the shaft 25 carries a gear 28 meshing with a similar gear 29 secured to shaft 30. The shaft 30 carries a sprocket 32 which drives a sprocket chain 34 engaging sprockets 36 and 38 on the shafts 26 and 27 respectively. A tension sprocket...
40 tends to hold the sprocket chain 34 sufficiently taut.

The former 16 is supported by a shoe 42 which in turn is supported from a bridge 43 extending across the machine and supported by arm 44 forming part of the framework of the machine.

For severing the tube into bag sections the usual sprocket bars 45 are provided and these are carried by a sprocket chain 46 passing over sprockets 47. These sprockets are driven from the shaft 21, but the driving connections are not shown, as they are common in bag machines and are well known. As is also common in bag machines, the tube is somewhat retarded by the pinch bar mechanism and slack is created in the tube at the time that one of the striker bars 45 engages the under side of the tube to sever it against the edge of the former and the edge 48 of a lip knife 49, suitably supported thereon.

All of the mechanism so far described is that which is usually found in a bag machine with the exception of the additional hardened steel roller 10 of the die 12.

To be understood, of course, that the roller 21 of the pinch bar mechanism rotates once for each bag made. Also each of the shafts 26 and 27 make one rotation for each bag made, consequently, the diagonal cuts made by the dies 9, and the convex cuts made by the die 12 are each spaced at bag section intervals apart.

It is desirable in making the bag of the present invention to have the seam at the side and therefore in Fig. 2 the line of paste indicated at 33 is near the right hand edge of the web. The paste is supplied as usual by a paste disk 53 dipping into a paste pot 54.

Referring again to Fig. 2, the diagonal cuts made by the dies 9 are indicated by the reference character 56 and each pair of cuts converges in the direction of the feeding movement of the web indicated by the arrow in Fig. 2. When the web is folded to form a bag tube the longitudinal folds are preferably coincident with the divergent ends of the diagonal cuts 56.

The ends of the tube can be cut off in a line slightly spaced from a line joining the convergent ends of the cuts 56, as indicated by dotted lines a—a and b—b Figs. 2 and 6. This spacing is not necessary, however, but has the advantage of causing the tab formed by the cuts 56 along with the tube section, so that the tab does not appear in the bottom of the finished bag. The spacing may be accomplished by the proper setting of the die 12 on its shaft 26, so that the die 12 makes its cut slightly prior to the time when the dies 9 make their cuts.

After the web has been folded into a tube, the diagonal cuts and the convex cuts may both be in the same bag wall or one set of cuts may be in one wall and the other set in the other wall. In Fig. 2, both cuts are underneath the former and hence these cuts are shown in dotted lines in the lower portion of Fig. 2 where the web is shown in folded condition. A portion of the serrated end of the former 16 is shown in full lines in Fig. 2 where the bag tube has been broken apart. The lip knife 48 is also shown and it is at this point that the tube is severed into bag section, by the former and the lip knife. After the tube has been so severed it has the appearance indicated at 56 Fig. 2. Each bag section after severance, therefore, has a gusseted flap at one end and a trapezoidal flap indicated at 60, Fig. 2, at its other end. The trapezoidal flap 50 is finally folded over to close the bag bottom. The bag section 58 also contains in one wall thereof the convex cut 57.

In order that the bag produced by the present method may be best understood, reference is made to the engaging envelope generally used, the method contemplates further operations on a bag tube section after it has been severed from the main tube. The method contemplates cutting off the end of the section which is to constitute the open end of the bag and while this cutting off may be done on a separate machine, it is contemplated that the complete bag be automatically made as one continuous operation on a bag machine. Therefore, the machine is further modified to effect this cutting operation.

The mechanism for accomplishing this includes a cylinder 62 mounted on shaft 63 and a cylinder 64 mounted on shaft 65, the two shafts 63 and 65 being geared together in a 1—1 ratio. The shaft 65 is driven through the shaft 21 of the pinch bar mechanism by connected gearing not illustrated in detail, but so proportioned that each of the shafts 63 and 65 make one rotation as shaft 21 makes one rotation, that is to say, one rotation during each bag section produced. The upper roller 62 is provided with suitable dies. One of these dies 66 is so shaped as to cut out a round hole indicated at 67, Fig. 2. The roller also carries another die 68 which may be shaped as shown in Fig. 6 or as shown in Fig. 5. As shown in Fig. 6, the die 68 has a central convex portion 70 of relatively large radius, while the die 68 as shown in Fig. 7 has a central portion 72 of relatively small radius.

After the bag tube section has been severed, it passes between the rollers 62 and 64 and is subjected to the action of the dies 66 and 68. The die 68 cuts off the upper portion of a bag tube section which upper portion is indicated at 74, Fig. 2, and constitutes waste, which may be disposed of in any suitable manner.

The dies 62 are carried across one tube wall by a continuous cut, although not necessarily a straight cut. It cuts across the other wall along a line which intersects the ends of a cut 51 and extends to the sides of a tube section. The intersection of the die cut with the convex cut 61 is near the ends of said cut. Theoretically it would be at the ends of the cut 51, but in the practice of the method on a bag machine it is not practical to cut with theoretical accuracy.

After the dies have acted on a bag tube section it presents the appearance shown at 75 in Fig. 2. From the rollers 62 and 64 the tube passes to the usual mechanism for folding and pasting the bottom flap of the bag. This mechanism includes an upper roller 76 carrying a paste bar 77 and a tucker blade 78 as usual in bags of this character. A paste is applied, as usual, from a paste pot 51 having a roller 82 adapted to be contacted by the paste bar 77. The bag is then in completed form and is ready for delivery by any suitable delivery means, such, for instance as indicated by the reference character 84 Fig. 2.

The finished bag, when acted upon by the cutter 66, having the form shown in Fig. 3, presents the appearance shown in Fig. 4. This view shows the rear wall of the bag. The cut made by the portion 10 of the cutter 66 is indicated...
The cut 87, which originally was made in the web, is in the front wall of the bag and is shown in dotted lines in Fig. 5. The cut-out portion 87 constitutes a thumb notch whereby the bag may readily be opened. From the edges of this notch or thumb opening the upper ends of both walls of the bag coincide.

In Figs. 6 to 9 inclusive there is shown a somewhat modified form of bag although the essential steps in the method by which this bag is produced are the same. The modified type of bag is made by changing the shape of the die 12.

As shown in Fig. 6, the die 12 instead of making a convex cut of relatively small dimensions, makes a convex cut such as indicated at 86, of relatively large dimensions.

The diagonal cuts 85 are exactly the same and the web is folded in the same way and cut into bag tube sections by the former 18 and the lip knife 48.

As already indicated, the cutter 66 is modified in that a portion which makes the thumb notch or small cut-out as shown in Fig. 7 and makes a continuous cut through one wall of a bag tube section but the cuts in the other wall intersect the ends of the larger cuts 85 and extend to the side edges of the section.

The finished bag shown in Fig. 8 therefore has the cut 12 made by the portion 12 of the cutter 66, in the rear wall of the bag and the larger cut 86 is in the front wall and therefore appears in dotted lines in Fig. 8, which figure shows the rear view of the bag.

A distinction is made between the rear wall and the front wall of the bag and is based on the fact that the flap 60 is folded over on one wall which, for convenience has been designated as the rear wall. The front wall therefore is plain.

The method, with the modification so far described, may be practiced in different ways and the result will be a slightly different type of bag. For instance, if the cutter 68 and the die 12 are both omitted but the die 86 retained then a bag section such as shown in Fig. 10 will be produced and when the bottom flap 65 is closed, the finished bag has the appearance shown in Fig. 11.

A still further modification of the method is shown in Fig. 12 in which the convex cuts 86 of Fig. 6 are made discontinuous instead of continuous. The cuts as shown in Fig. 12 are in two parts 86a and 86b.

In practicing the method as modified in Fig. 12, the cutter 68 has its central portion 72 shaped slightly differently so that it intersects not only the remote ends of the cuts 86a and 86b but also intersects their adjacent ends, as clearly shown at the bottom of Fig. 12. The finished bag then appears as shown in Fig. 14.

By making the convex cuts discontinuous as above described, the web of paper is not weakened quite as much as if full interrupted convex cuts were made, and hence when the tube is severed by the sections by the end of the former 18 and the lip knife 48 there is less danger of improper severance which might otherwise possibly occur. The modification shown in Fig. 12 therefore may be considered as a somewhat additional refinement of the method described in connection with Fig. 6 and it has certain advantages when practiced as an automatic operation on a bag machine.

To further lessen the possibility of improper severance, the web may be perforated along a line joining the convergent ends of the diagonal cuts 86. This line of perforations 88 does not extend however, the entire distance between the convergent ends of the cuts 86, but extends for a distance somewhat less than the width of the bag tube section and preferably is centrally located.

In order to make this line of perforations, the shaft 27, Figs. 1 and 13, in addition to carrying the dies 9 also carries a perforating knife 82. It is of course obvious that these lines of perforations are spaced at bag section intervals apart.

In the Fig. 1 showing of the bag machine, the roller 8 has been described as a hardened steel roller. When the perforating knife 82 is used however, the roller 8 has its central portion covered with rubber as shown at 84, Fig. 13.

Since the cut off made by the end of the former 18 is in line with the perforations 88 the lower closing flap 60 will have a slightly different appearance when the perforating bar 82 is used and therefore the flap at the lower end of the bag in Figs. 12 and 14 is indicated by the reference character 84a.

In the drawings illustrating the method and its modifications the web has been shown and described as being folded along longitudinal lines which meet the divergent ends of the diagonal cuts 86. The method is not limited to this way of folding since it might be folded in a manner to meet the convergent ends of the diagonal cuts. In the latter case of course, the trapezoidal flap would be at the top of the bag section and the gusseted flap would be at the bottom.

Other variations may be resorted to within the scope of the invention without departing from the spirit of the invention and some of the steps of the method may be used without others and the various steps may be combined in different ways.

What I claim:

1. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts and convex cuts centrally of the diagonal cuts in a continuously advancing web of paper, said pairs of cuts and said convex cuts spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, the convex cuts being convex in the direction of web movement, the ends of said convex cuts being in a line spaced from a line joining the convergent ends of a pair of diagonal cuts, folding the web along lines which meet the divergent ends of the diagonal cuts to form a bag tube with the diagonal cuts and convex cuts in one wall thereof, severing the cut wall of the tube along a line which meets the convergent ends of a pair of diagonal cuts and severing the other wall from side to side along a line which meets the divergent ends of the same cuts to form a bag tube section, and subsequently severing one wall of a bag section by a continuous cut extending across said wall and severing the other wall by a cut extending from near each end of a convex cut to the side edge of said tube wall.

2. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts in a continuously advancing web of paper, said pairs of cuts spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, folding the web along longitudinal lines which meet the divergent ends of the diagonal cuts to form a bag tube with the diagonal cuts in one wall thereof, severing the cut wall along a line which
meets the convergent ends of a pair of diagonal cuts and the other wall from side to side along a line which meets the convergent ends of the other pair of cuts, to form a bag tube section, and forming a central opening in both bag tube section walls.

3. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts and convex cuts centrally of the diagonal cuts in a continuously advancing web of paper, said pairs of cuts and said convex cuts spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, the convex cuts being convex in the direction of web movement, the ends of said convex cuts being in a line spaced from the line joining the converging ends of a pair of diagonal cuts, folding the web along lines which meet the convergent ends of the diagonal cuts to form a bag tube with the diagonal cuts and convex cuts in one wall thereof, severing the cut wall of the tube along a line which meets the convergent ends of a pair of diagonal cuts and severing the other wall from side to side along a line which meets the convergent ends of the same cuts to form a bag tube section having a gusseted flap at one end and a trapezoidal flap at the other end, and cutting off the gusseted end of a bag tube section by subsequently severing one wall thereof by a continuous cut extending across said wall and severing the other wall by a cut extending from near each end of a convex cut to the side edge of said tube wall, and finally folding and pasting the trapezoidal flap to complete the bag.

4. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts in a continuously advancing web of paper, said pairs of cuts spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, folding the web along longitudinal lines which meet the convergent ends of the diagonal cuts to form a bag tube with the diagonal cuts in one wall thereof, severing the cut wall along a line which meets the convergent ends of a pair of diagonal cuts and the other wall from side to side along a line which meets the convergent ends of the same pair of cuts, to form a bag tube section having a gusseted flap at one end and a trapezoidal flap at the other end, and subsequently forming a central opening in both bag tube section walls, and finally closing one end of a tube section by folding over and pasting the trapezoidal flap to complete the bag.

5. In a method of making a record holding bag, those steps which include making convex cuts in a continuously advancing web of paper, said pairs of cuts being spaced at bag section intervals apart, the cuts being convex in the direction of web movement, forming transverse lines of perforations in the web also at bag section intervals apart, said transverse perforations extending a distance less than the width of a bag section, folding the web to form a bag tube with said cuts and said line of perforations located centrally of one wall of the tube, severing the tube into bag sections and subsequently severing one wall of a section by a continuous cut extending across said wall and spaced from said line of perforations and severing the other wall by a cut intersecting the convex cut.

6. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts and convex cuts centrally of the diagonal cuts in a continuously advancing web of paper, said pairs of cuts and said convex cuts spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, the convex cuts being convex in the direction of web movement, the ends of said convex cuts being in a line spaced from the line joining the converging ends of a pair of diagonal cuts, forming transverse lines of perforations in the web also at bag section intervals apart, said perforations extending a distance less than the width of a bag section and in a line joining the converging ends of a pair of diagonal cuts, folding the web along lines which meet the convergent ends of the diagonal cuts to form a bag tube with the diagonal cuts, convex cuts and line of perforations in one wall thereof, severing the cut wall of the tube along said line of perforations and severing the other wall from side to side along a line which meets the convergent ends of the same cuts to form a bag tube section having a gusseted flap at one end and a trapezoidal flap at the other end, and cutting the gusseted end of the bag tube section by subsequently severing one wall thereof by a continuous cut extending across said wall and severing the other wall by a cut intersecting the convex cut and finally folding and pasting the trapezoidal flap to complete the bag.

7. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts and discontinuous convex cuts centrally of the diagonal cuts in a continuously advancing web of paper, said pairs of cuts and said discontinuous convex cuts spaced at bag section intervals apart, the convex cuts being convex in the direction of web movement, the inner ends of which are spaced apart so as to leave a substantial portion of the web uncut folding the web along lines which meet the ends of a pair of diagonal cuts to form a bag tube, severing the tube into bag sections by a transverse cut in one wall thereof which joins one end of each pair of diagonal cuts and the other wall along a line which joins the other ends of the same cuts and subsequently severing one wall by a continuous cut spaced from the first line of perforation and severing the other wall by a cut intersecting the discontinuous convex cut at two points thereof.

8. In a method of making a record holding bag, those steps which include making pairs of diagonal cuts in a continuously advancing web of paper, said pairs of cuts being spaced at bag section intervals apart, each pair of diagonal cuts converging in the direction of web movement, folding the web along lines which meet the converging ends of the diagonal cuts to form a bag tube with the diagonal cuts in one wall thereof, severing the cut wall of the tube along a line which meets the convergent ends of a pair of diagonal cuts, severing the other wall from side to side along a line which meets the convergent ends of the same cuts to form a bag tube section, and forming a central opening in both walls of said bag tube section.

GEORGE W. POPPE.