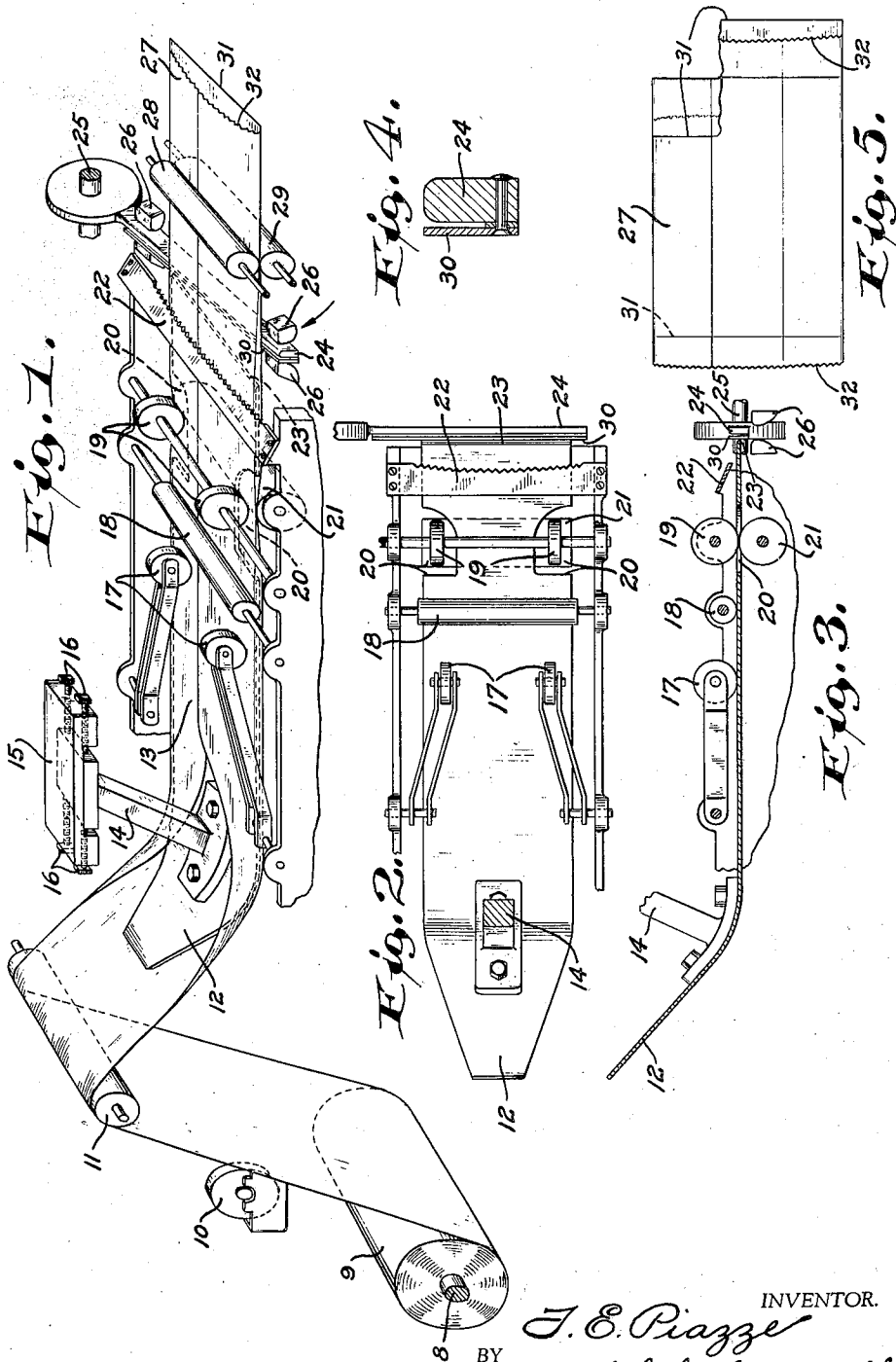


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METHOD OF MAKING BAGS
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METHOD OF MAKING BAGS

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My present invention relates generally to improvements in the art of manufacturing bag-like receptacles, and relates more specifically to an improved method of making improved bags from sheet material such as thin paper or cellulose film.

Generally defined, an object of my present invention is to provide an improved method of manufacturing durable bags from thin sheet material.

Bags formed of cellulose film or similar thin and relatively transparent material, have become quite popular for the purpose of merchandizing various commodities in batches. Such bags are ordinarily formed in succession from a continuous ribbon of the film or other stock, which is first folded into longitudinal tubular form with the overlapping edges glued together, and is subsequently cut into desirable lengths and transversely folded and glued at an end of each length or section to produce the final bag. Because of the thinness and texture of the stock used in forming these bags, it is necessary in order to permit convenient spreading of the open bag end, to have the front and rear edges at the open end staggered or off-set. This off-setting of the edges at the ends of the tubular sections combined with the fact that the cellulose film is apt to tear unless properly cut, makes it rather difficult to sever the tubular stock into sections, except by utilizing serrated transverse lip-knives and a striker bar which is adapted to impinge against the tube near the lip-knives and to practically tear the sheet stock off along serrated edges. While such serrated edges are relatively desirable at the extreme outer ends of the completed bags and adjacent to the openings or open ends thereof, they are not desirable along the inner edges of these bag openings since the serrations cause the material to tear quite readily when the bags are being filled. It is therefore very desirable to provide each bag with an open end bounded along one side by a serrated edge and along its opposite side by a smooth edge, but such bag structures cannot be commercially produced in rapid succession, by prior known methods.

It is therefore a more specific object of my present invention to provide an improved method of producing such improved bags in a most effective manner and from a continuous ribbon of stock advancing at high speed.

In accordance with my invention, the stock ribbon is longitudinally folded and glued into tubular form as with the prior methods, but I have provided simple and highly efficient means for automatically severing the tube into successive

sections each of which has staggered or off-set transverse cuts at least at one end thereof, one of which cuts is serrated while the other is smooth or unserrated. The bags subsequently produced by this method, are superior to the prior bags of the same general type so that my invention involves not only the improved method, but also the improved apparatus for effecting commercial exploitation of the method, and the improved resultant article.

A clear conception of the several steps of my improved method, and of the construction and operation of a machine for carrying on these steps and of the resultant product, may be had by referring to the drawing accompanying and forming a part of this specification, wherein like reference characters designate the same or similar parts in the several views.

Fig. 1 is a somewhat diagrammatic perspective view of one type of apparatus for carrying on my improved method of producing bags, the mechanism for initially folding the stock into tubular form having been omitted;

Fig. 2 is a top view of a part of the apparatus shown in Fig. 1;

Fig. 3 is a longitudinal section through a fragment of the improved apparatus;

Fig. 4 is an enlarged transverse section through the cutting and striker bar; and

Fig. 5 is a plan view of one of the improved bags with a portion of the closed end folded open.

While I have shown the invention as being applied in the production of bags from cellulose film and each having the outer edge of the open end serrated while the inner edge is straight and smooth, it is not the intent to thereby unnecessarily restrict the scope, since either edge of the bag opening may be smooth cut and this cut may be curved.

Referring to the drawing, the bag producing machine illustrated therein diagrammatically, comprises in general means 8 providing a support for a roll 9 of stock such as thin and relatively transparent cellulose film or paper, which is adapted to be delivered in continuous ribbon form past an adhesive applying roller 10 and over a roller 11 to a tube former of usual construction (not shown); an adjustable normally stationary elongated former plate 12 extending longitudinally within the tube 13 and away from the roller 11 and tube former; an adjustable support 14 for the plate 12 adjustably mounted with respect to a fixed support 15, by means of screws 16; a pair of retaining rollers 17 resting upon the upper portion of the tube 13 above the plate 12 some-

what beyond the support 14; a former plate reaction roll 18 coacting with the former plate 12 through the overlapped edges of the tube 13 beyond the rollers 17; a pair of laterally separated upper driving rollers 19 coacting through the tube 13 and through side notches or cut-outs 20 in the plate 12, with a lower driving roller 21, so as to constantly advance the tube 13 along the plate 12; a serrated or toothed lip-knife 22 fixedly positioned above the tube 13 between the driving rollers 19, 21 and a transverse knife edge 23 at the extreme end of the plate 12 within the tube 13; a cutting and striker bar 24 revolvable about the axis of a driving shaft 25, and being swingable upwardly between guides 26 so as to coact with the knife edge 23 and with the lip-knife to sever the tube 13 into successive equal lengths or sections 27; coacting upper and lower draw rollers 28, 29 respectively, cooperating with the successive bag sections 27 to remove the same from the zone of severance; mechanism of well known construction for subsequently folding and gluing one end of each section 27 to complete the bags; and driving mechanism for positively rotating the various feed rollers and for revolving the bar 24 in properly timed relationship.

The tube forming mechanism, the bag end folding and gluing mechanism, and the driving mechanism are all of old and well known construction and these old mechanisms have been intentionally omitted from the present disclosure in order to avoid undesirable complications.

The plate 12 is of relatively thin but rigid construction, and the adjusting screws 16 for the plate support 14 may obviously be utilized to insure proper cooperation of the cutting blade 23 with the blade 30 of the cutting and striking bar 24. The lip-knife 22 should also be so mounted that the off-set between the cut edges 31, 32 of each bag section 27 may be varied, and the guides 26 are cooperable with the bar 24 and with the blade 30 so as to prevent vibration or chattering thereof and to insure proper cutting cooperation with the knife edge 23. While either end of each bag section 27 may be folded over and attached to complete each bag, it is preferable to fold the bag end as shown in Fig. 5, so that the smooth edge 31 is the inner edge at the bag opening, and is the outer edge at the closed end of the bag.

When carrying on my improved method of producing bags with the aid of the apparatus above described, the stock is being continuously delivered from the supply roll 9 past the adhesive applying roller which deposits a continuous strip of adhesive such as glue along one edge of the advancing ribbon. The ribbon is thereafter continuously folded along its longitudinal side portions to superimpose the glued edge over the opposite edge, and to thereby form the advancing collapsed tube 13 embracing and travelling along the fixed plate 12. The rollers 17 function to guide the tube 13 and the reaction roll 18 is set as near as possible to the forming plate 12 so as to prevent this plate from bending upwardly whenever the severing bar strikes the advancing tube 13 and edge 23, while the driving rollers 19, 21 coact with the tube 13 at the notches 20 of the plate 12 and thus constantly impart advancing motion to the continuous tube 13.

The cutting and striker bar 24 with its blade 30 is being constantly revolved in a clockwise direction as viewed in Fig. 1, and at a uniform rate of speed. As the bar 24 and blade 30 are

brought upwardly between the guides 26 at a high rate of speed, the blade 30 quickly coacts with the cutting edge 23 of the plate 12 to produce smooth straight cuts or edges 31 across the under-side of the adjacent portion of the tube 13. At the same time that this smooth cutting is being effected, the bar 24 imparts a blow to the uncut upper portion of the tube and causes the stationary lip-knife to tear or sever the adjacent portions of the tube 13 to produce the serrated edges 32 spaced from the smooth cut edges 31. The extreme side portions of the tube 13 and connecting the corresponding off-set cuts 31, 32, and which have been previously creased, are torn apart during delivery of the successive blows; and the tube sections 27 which are thus successively removed from the end of the advancing collapsed tube 13, are subsequently closed at one end to form the completed bags shown in Fig. 5. It will thus be apparent that with my improved process and apparatus, the improved bags with smooth and serrated off-set edges 31, 32 are quickly and automatically produced.

From the foregoing detailed description it will be obvious that I have provided a simple but effective method of rapidly producing a succession of bags from relatively thin stock such as cellulose film, each of which has a set of staggered or off-set edges 31, 32 at each end thereof. One end of each bag may be subsequently folded and fastened either so as to provide an outer serrated or an outer smooth edge at the bag opening; and the provision of the smooth edges at the opposite ends of the bag and the disposition thereof as shown in Fig. 5, will eliminate undesirable tearing during loading of the bags and will also present a neater finish at the closed bag end. My improved process may be conveniently and automatically carried on with the aid of relatively simple and compact apparatus, and the successive bags may be effectively produced without noticeably retarding the advancement of the collapsed tube 13. The invention has proven highly successful in actual commercial use and the bags produced by the new method have proven superior to the prior bags of the same general type produced by the previous processes.

It should be understood that it is not desired to limit this invention to the exact steps of the method or to the precise details of construction of the apparatus, herein shown and described, for various modifications within the scope of the claims, may occur to persons skilled in the art.

I claim:

1. The method of making bags, which comprises, forming a continuously advancing collapsed tube of stock and removing successive sections from an end of the tube by simultaneously transversely shear cutting one layer and impact tearing the other layer along off-set lines of cleavage.

2. The method of making bags, which comprises, forming a continuously advancing collapsed tube of stock, and removing successive sections from an end of the tube by simultaneously transversely shear cutting one layer and impact tearing the other layer along off-set lines of cleavage while at the same time tearing the edge portions of the tube to sever the same between the transverse lines of severance.

3. The method of making bags, which comprises, forming an elongated collapsed tube of stock, and removing successive sections of the tube by simultaneously transversely shear cutting one layer and impact tearing the adjacent

layer along off-set lines of cleavage while at the same time parting the edge portions of the tube between the transverse lines of cleavage.

- 5 4. The method of making bags, which comprises, forming an elongated advancing collapsed tube of stock, and removing successive sections of the tube by simultaneously transversely severing one layer by shear cutting along a smooth line and the other layer by impact tearing along a serrated line off-set with respect to the smooth line of the first mentioned layer while at the same time parting the edge portions of the tube between the cooperating transverse lines of severance.

- 10 5. The method of making bags, which comprises, forming a longitudinally advancing col-

lapsed tube of stock, and removing successive sections of the tube by transversely severing one layer by draw cutting through the same along a smooth line and the other layer by impact tearing along a serrated line.

6. The method of making bags, which comprises, forming a longitudinally advancing collapsed tube of stock, and removing successive sections of the tube by transversely severing one layer by draw cutting through the same along a smooth line and the other layer by impact tearing along a serrated line offset with respect to the smooth sheared edge.

THOMAS E. PIAZZE.