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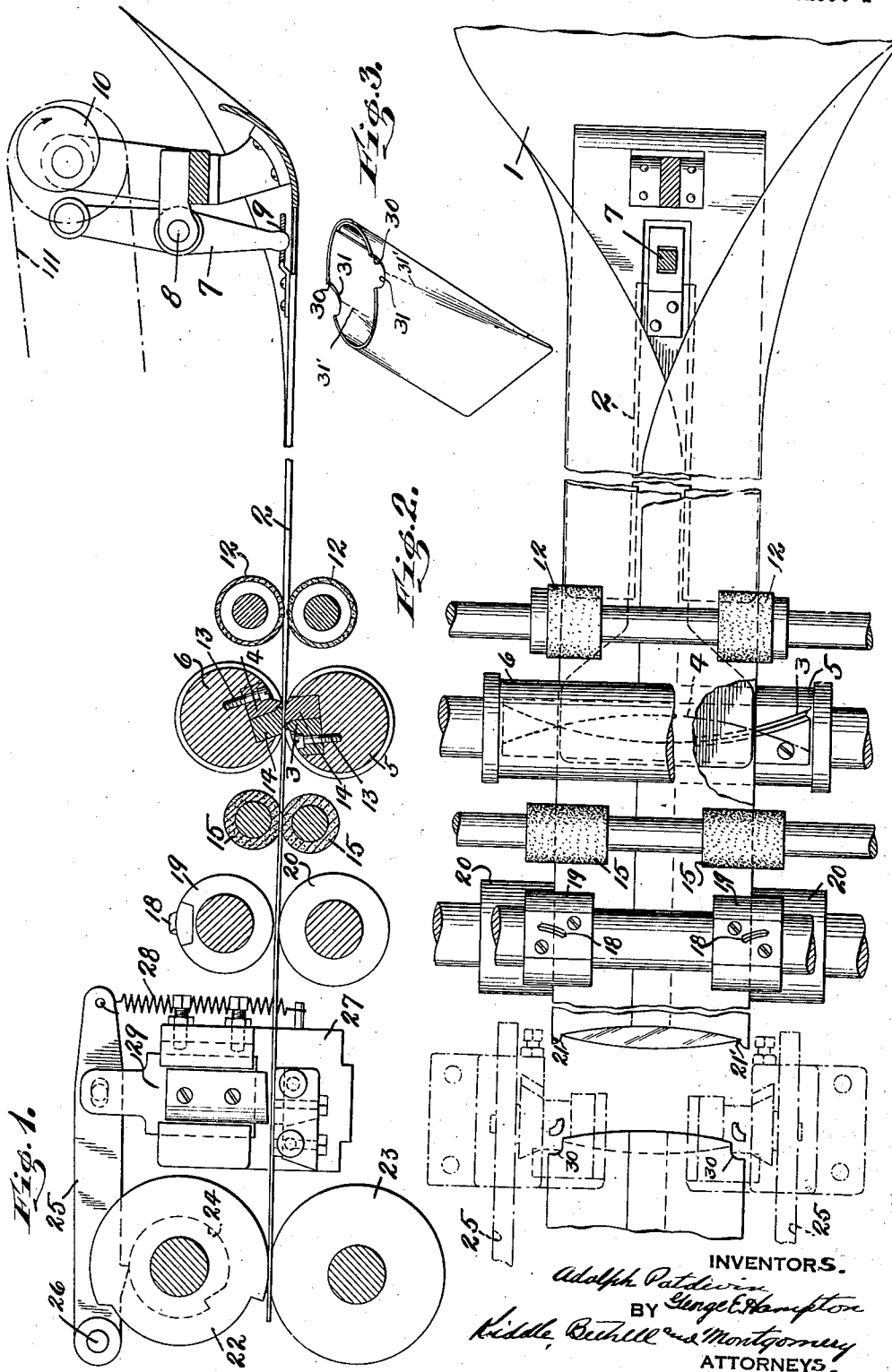
A. POTDEVIN ET AL

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METHOD OF MAKING BAGS AND THE LIKE

Filed Sept. 29, 1934

3 Sheets-Sheet 1



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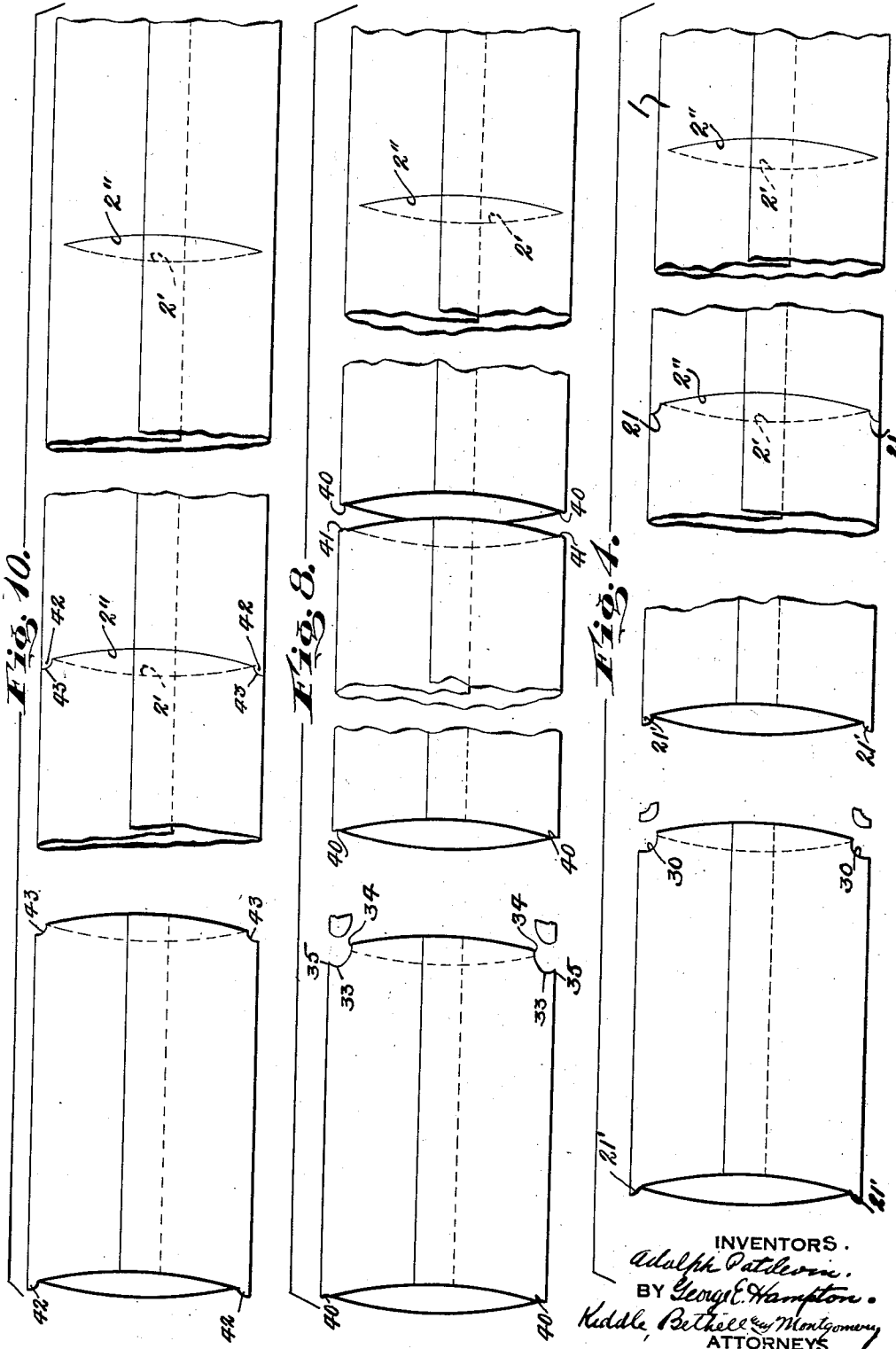
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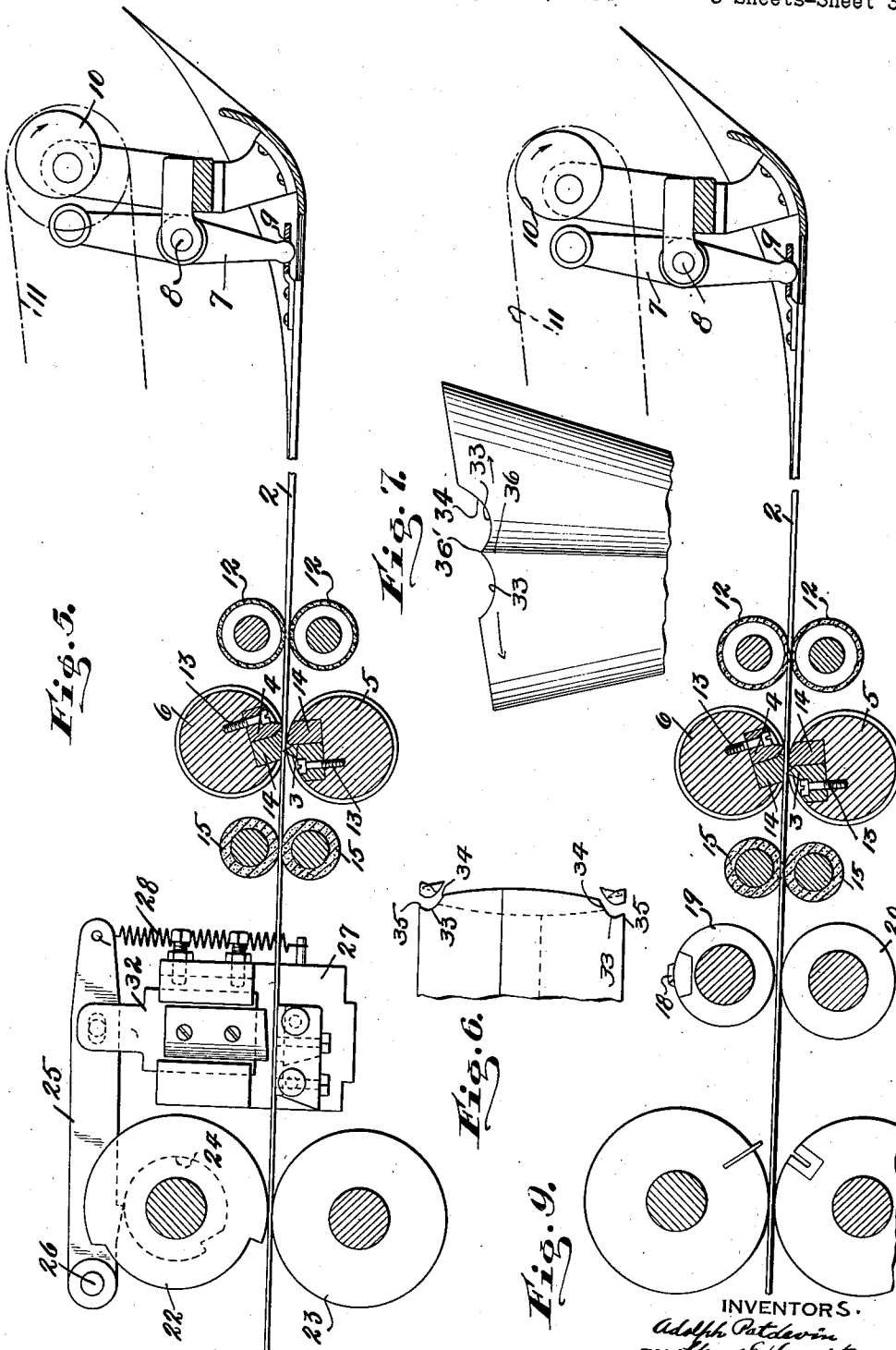
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UNITED STATES PATENT OFFICE

2,085,766

METHOD OF MAKING BAGS AND THE LIKE

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Application September 29, 1934, Serial No. 746,082

21 Claims. (Cl. 93—35)

This invention relates to a method of making bags and is particularly adapted for making bags of cellulose acetate, cellulose hydrate, glassine and the like.

As will be brought out in detail hereinafter, in one embodiment of the present invention the bag material is first partially severed into bag lengths, this partial severing operation being followed by a second severing or cut-off operation; in another procedure herein illustrated and described the bag material is partially severed, then torn apart and the top end of the bag length trimmed; while in still another procedure herein illustrated and described the bag material is first partially cut off, this operation being followed by a finish cut-off, and finally the top end of the bag length is trimmed.

It is to be noted that in the last two procedures above referred to the top end of the bag length, i. e., that end of the bag length which is to constitute the top of the bag, is trimmed. This procedure is of advantage with bags of cellulose acetate and cellulose hydrate particularly, inasmuch as these materials are quite brittle and crack and tear readily. If the tube material when being divided into bag lengths is cracked at the corner or corners, the trimming operation removes this cracked portion, and cracking of the bag at the corners is eliminated.

As will be brought out hereinafter when a rolling pinch cut is employed in the first or partial severing operation a smooth cut-off is assured.

In the accompanying drawings:

Fig. 1 is a sectional elevational view illustrating one embodiment of our invention;

Fig. 2 is a plan view of the apparatus of Fig. 1;

Fig. 3 is a fragmentary view illustrating one method of cutting out or trimming the corners of the bag length;

Fig. 4 is an explanatory view illustrating the various steps of our process with reference to Figs. 1 and 2;

Fig. 5 is a sectional elevational view similar to Fig. 1 of another embodiment of our invention;

Figs. 6, 7 and 8 are explanatory views having particular reference to the procedure followed in Fig. 5;

Fig. 9 is a view similar to Figs. 1 and 5 of still another embodiment of our invention; and

Fig. 10 is an explanatory view having particular reference to the procedure followed in Fig. 4.

Referring first of all to Figs. 1, 2, 3 and 4. In these figures the material from which the bags

are to be made and which is designated 1 is fed to the machine and as it passes into the machine it is tubed as shown in Fig. 2. The tubing mechanism is not illustrated in detail inasmuch as the same may be well known commercial apparatus and is not claimed herein.

It will be seen from Figs. 1 and 2 that the material 1 is tubed about a cut-off plate designated 2 mounted on the tubing mechanism. This plate is a thin flat plate with upper and lower plane faces and is adapted to be reciprocated lengthwise of the machine in timed relation with the other mechanism of the machine, as will be brought out fully hereinafter. The cut-off plate is adapted to be advanced in the direction of the travel of the material 1 by cut-off blades or cutters 3 and 4 which are mounted in cut-off rollers 5 and 6, respectively, and to be retracted by a lever 7 pivoted at 8, one end of this lever extending through the tail of the cut-off plate 2 as shown at 9.

The plate engaging end of the retracting lever 7 is positively actuated by cam 10 driven by a chain 11, for instance, it being understood, of course, that this cam or eccentric 10 is driven in timed relation with the rest of the machine so that the cut-off plate 2 will be retracted in the proper timed relation to the operation of the cut-off blades or knives 3 and 4.

Between the tail or rear end of the cut-off plate 2 and the cut-off rollers 5 and 6 we provide forwarding rollers 12, the function of which is to advance the tubed material continuously through the machine to the cut-off rollers 5 and 6.

The cutters 3 and 4 are set into the face of the rollers 5 and 6 as will be seen from the drawings and are held in place by screws 13, a land 14 being set into the face of each roller beside the cutter.

It will be appreciated that when the cut-off plate 2 is not being advanced by the cutters 3 and 4 and lands 14 it is free to be retracted positively by the retracting lever 7.

The cut-off rollers 5 and 6 are so set with respect to each other that the cutter 3, for example, will perform its operation ahead of the cutter 4 which will provide a projecting flap on the lower wall of the bag material. This order of operation of the cutters 3 and 4 may be reversed. The cut-off rollers 5 and 6 are adjustable circumferentially so as to vary the operation of the knives or cutters 3 and 4.

The cutters 3 and 4 are smooth edged, i. e., not serrated, and are curved when viewed in plan, as illustrated in Fig. 2. It will be appre-

ciated that when the leading cutter, the cutter 3 as illustrated in the drawings, engages the lower wall of the tubed material 1 it will roll over the plane face of the hard metal cut-off plate 2 to cut through the lower wall of the tubed material with a smooth rolling pinch cut. The cut is designated 2' in Fig. 4 and extends transversely of the tube from a point adjacent one edge of the tube to a point adjacent the opposite edge. The cut-off plate at this time is bearing against the land 14 in the upper cut-off roller 6 so as to be carried forward or advanced at cutter speed during the cutting operation. This operation is followed by a similar operation of the cutter 4 which rolls over the upper plane face of the cut-off plate 2 partially to divide the upper wall of the tubed material 1 with a rolling pinch cut as shown at 2'', the plate 2 in this operation bearing against the land 14 in the lower roller 5 and moving forward at cutter speed.

During this partial severing or dividing operation the bag tubing is being engaged by the rollers 15 so as to keep the tubing from plugging. Inasmuch as the cutters 3 and 4 engage only the plane faces of the cut-off plate 2 it will be appreciated that the edges of the tubed material for a distance at least equal to the thickness of the cut-off plate are still uncut. This is shown in Fig. 4 on a somewhat exaggerated scale for the sake of clarity.

The severing or dividing operation is completed by the cutters 18 carried by the rollers 19 to which the tube is next advanced, these cutters cooperating with plain rollers 20 so as to cut through the tube at the corners as shown at 21 in Fig. 4.

Up to this point, therefore, we have provided for partially severing the tube material 1 transversely by the action of the cutters 3 and 4 and the cut-off plate 2, this severing or dividing operation as above pointed out being a rolling pinch cut, the severing operation being completed with the knives or cutters 18 as just described.

The bag length, at this point, will have a projecting tab 21' at each corner of the leading end of the bag length, this end later to be bottomed in finishing the bag, while the trailing end of the bag length will have a complementary cut-out. This end of the bag length eventually is to be the top end of the finished bag.

Beyond the rollers 19 and 20 we provide pairs of rollers 22 and 23. The rollers 22 are equipped with cams 24 for controlling cutter or punch operating levers 25 each of which is pivoted at 26. A die plate 27 lies below the advancing bag length, and springs 28 have one end secured to this die plate and their other ends to the free ends of the levers 25, as seen in Fig. 1.

Attached to the levers 25 are die plungers 29 cooperating with the die plate 27 to cut out or trim the corners of the trailing end of bag length as shown at 30 in Figs. 2 and 4. The die plungers 29 may be so shaped that the notches 30 just referred to made thereby are such that when the end of the tube is opened up as illustrated in Fig. 3 the bottom 31 of each cut-out is practically straight, that is, substantially at right angles to the edges 31' of the bag length. As a consequence there are no sharp corners for a tear to start in the top end of the tube, particularly at the point where the material is folded in tubing; and if in the operation of severing or dividing the tubing into bag lengths initially the corners of the bag length become shattered or cracked these shattered or cracked portions will be removed by the

cutters or punches 29 in the trimming operation.

With this embodiment of our invention, therefore, we provide for a partial division of the tubed material as by a rolling pinch cut, followed by a completion of the dividing operation with rotary cutters 18, this operation or step being followed by a trimming operation as by cutting out the corners of the trailing end of the bag length, as above explained.

Referring now to the embodiment of our invention as illustrated in Figs. 5, 6, 7 and 8. In this embodiment of our invention the cutters 18 of Figs. 1 and 2 are omitted and the segmental rollers 22 and the rollers 23 are driven at a higher peripheral speed than the rollers 15 so that when the rollers 22 and 23 engage the partially severed tubed material a sudden tension will be placed on the same in the direction of its length to finish the dividing operation by tearing through the corners or edges of the tube as shown at 40 and 41. This procedure is followed by cutting out or trimming the corners of the trailing end of the bag length as explained in connection with the first embodiment of our invention described above.

In this embodiment of the invention, however, we have changed the shape of the die plungers and cooperating plate, the die plungers 32 which correspond to the die plungers 29 of Fig. 1 being so shaped that the bottom 33 of each of the cut-outs 34, with the tubed material flat, as illustrated in Figs. 6 and 8, will be below the outer edge 35 of each cut-out, that is, below the edges of the tube, with the result that when the tubed material is opened up as illustrated in Fig. 7 the bottom of each notch is in the form of an inverted V which we have designated 36. Consequently if tension is placed on the tube in the direction of the arrows on Fig. 7, tending to tear the tube at the corners, the tension is transferred from the edge of the end of the tube to below the apex 36' of the inverted V's 36 practically necessitating bursting of the material of the tube below the apex of each V before a tear can start.

In the embodiment of our invention illustrated in Figs. 9 and 10 we have eliminated the final trimming operation above referred to. Here we partially divide the tubed material as before with a rolling pinch cut and then finish the dividing operation with the cutters 18, leaving tabs 42 at the bottoming end of the bag length with a complementary cut-back or cut-out 43 at the top end of the bag length.

Comparing the several steps taken in the practice of our invention: As illustrated in Figs. 1, 2, 3 and 4, for instance, it will be seen that we partially divide the tubed material with a rolling pinch cut, following this operation with a rolling cut-off to finish the severing operation, this in turn being followed by cutting out or trimming the corners of the trailing end or top end of the bag length or tube, this trimming step reducing to a minimum the likelihood of the bag length or the finished bag tearing at the corners of the top end; in Figs. 5, 6, 7 and 8 we eliminate the second step of Fig. 1 or rather we substitute the second step with a tearing operation, following the tearing operation by cutting out or trimming the corners of the trailing or top end of the tube; while in Figs. 9 and 10 we partially divide the tube with a rolling pinch cut and then finish the dividing operation with a cut-back positive rolling cut.

It will be seen that in all cases the top end of the bag length, i. e., that end which is to compose the top of a finished bag is free of sharp

corners so as to reduce to a minimum likelihood of the bag tearing at the corners of the top, and that in the embodiments of the invention illustrated in Figs. 4 and 10 the bottom end of the bag length is provided with a projecting tab at the corners which, as will be understood, will be folded in with the bottom in the bottoming operation.

We have found that our invention has great merit when dealing with materials such as cellulose acetate, cellulose hydrate, glassine and the like, which not only tear very readily but which materials are quite brittle so that if the corners of the top end of the bag or bag length are at all splintered or cracked, which our method avoids, there is great likelihood of tearing at these points. By cutting back or trimming the corners of the tube, as above explained, the splintered material, if any exists, is removed so that we are assured of smooth corners in the top end of every bag length.

We submit it will be evident, furthermore, that if the corners of the tube are cut out or trimmed, as illustrated both in Figs. 4 and 8, the likelihood of tearing the tube at these corners is still further reduced; as a matter of fact, with the corners cut back or trimmed as illustrated in Figs. 7 and 8 it is practically necessary to burst the material below the apex of the V's before a tear can be started.

We have described the cut-off plate 2 as being positively retracted by lever 7. It is to be understood, however, that if desired this cam controlled lever mechanism may be substituted by the arrangement shown in the copending application of Paul Hunziker, Serial No. 647,502, filed December 16, 1932, in which the cut-off plate is spring retracted.

We wish it to be understood also that the die plungers 29 and 32 of Figs. 1 and 5 together with their cooperating plates may be substituted by other mechanism.

Obviously various other changes may be made in the details of construction and arrangement of parts herein described within the spirit and scope of our invention.

What we claim is:—

1. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and cutting the tube edges with a curved cut to provide a bag length with a concave cut at the opposite corners of one end thereof.

2. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, and on the further advance of the tubing cutting the opposite edges of the advancing tubing with a curved cut to provide a bag length with a concave cut at the opposite corners of the trailing end of the bag length.

3. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges to finish the dividing operation.

tions of the tube edges to finish the dividing operation.

4. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, and on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing to finish the dividing operation.

5. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges with a rolling cut to finish the dividing operation.

6. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing with a rolling pinch cut transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, and on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing with a rolling cut to finish the dividing operation.

7. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge at bag length intervals with a smooth rolling pinch cut, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges to finish the dividing operation.

8. In the making of bags and the like, the method which comprises tubing the bag material about a flat plate, rolling a pair of cutters over the smooth plane faces of the movable head of this plate to cut through the upper and lower walls of the tubing at bag length intervals with a rolling pinch cut from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges to finish the dividing operation.

9. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, cutting through the uncut portions of the tube edges to finish the dividing operation, and then trimming the opposite corners of the trailing edge of the bag length.

10. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, on the further advancing of the tubing cutting through the uncut portions

of the edges of the advancing tubing to finish the dividing operation, and then trimming the opposite corners of the trailing edge of the bag length.

11. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tube with a rolling pinch cut transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, and on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing with a rolling cut to finish the dividing operation, and finally trimming the opposite corners of the trailing edge of the bag length.

12. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, then cutting through the uncut portions of the tube edges to finish the dividing operation, and finally trimming the opposite corners of the end of the bag length to provide a cut-back at said corners so shaped that when the bag length is opened the bottom of each of these cut-backs will be substantially at right angles to the sides of the bag length.

13. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing with a rolling pinch cut from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, then cutting through the uncut portions of the tube edges with a rolling cut to finish the dividing operation, and finally trimming the opposite corners of the trailing end of the bag length to provide a cut-back at said corners so shaped that when the bag length is opened the bottom of each of these cut-backs will be substantially at right angles to the sides of the bag length.

14. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing to finish the dividing operation, and finally trimming the opposite corners of the trailing end of the advancing bag length to provide a cut-back at said corners so shaped that when the bag length is opened the bottom of each of these cut-backs will be substantially at right angles to the sides of the bag length.

15. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, cutting through the uncut portions of the tube edges with a rolling cut to finish the dividing operation, and finally trimming the opposite corners of the top end

of the bag length to provide a cut-back at said corners so shaped that when the tube is opened the bottom of each of these cut-backs will be substantially at right angles to the edges of the bag length.

16. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, then cutting through the uncut portions of the tube edges to finish the dividing operation, and finally trimming the opposite corners of the top end of the bag length to provide cut-backs so shaped that the bottom of each of said cut-backs forms an inverted V when the bag length is opened.

17. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge partially to divide the tubing into bag lengths, on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing to finish the dividing operation, and finally trimming the opposite corners of the trailing end of the bag length to provide cut-backs so shaped that the bottom of each of the cut-backs forms an inverted V when the bag length is opened.

18. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges with a curved cut to finish the dividing operation and to provide a bag length with concave cut-backs at the opposite corners of the trailing end and with complementary tabs at the leading end.

19. In the making of bags and the like, the method which comprises tubing the bag material while continuously advancing the same, cutting through the upper and lower walls of the advancing tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the opposite edge, partially to divide the tubing into bag lengths, and on the further advance of the tubing cutting through the uncut portions of the edges of the advancing tubing with a curved cut to finish the dividing operation and to provide the trailing end of the bag length with a concave cut at opposite corners and the leading end of the bag length with a complementary tab.

20. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut portions of the tube edges to finish the dividing operation and to provide a cut-back at each side of one end of the tube complementary to the opposite end of the tube, said cut-back being so shaped that when the tube is opened the bottom of each of these cut-backs will be substantially at right angles to the edges of the bag length.

21. In the making of bags and the like, the method which comprises tubing the bag material, cutting through the upper and lower walls of the tubing transversely of the tubing from adjacent one edge of the tubing to adjacent the other edge, partially to divide the tubing into bag lengths, and then cutting through the uncut

portions of the tube edges to finish the dividing operation and to provide a cut-back at each side of the tube so shaped that when the tube is opened the bottom of each of these cut-backs will form an inverted V.

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