

June 2, 1942.

A. POTDEVIN

2,285,228

METHOD AND APPARATUS FOR MAKING BAGS

Filed July 31, 1940

2 Sheets-Sheet 1

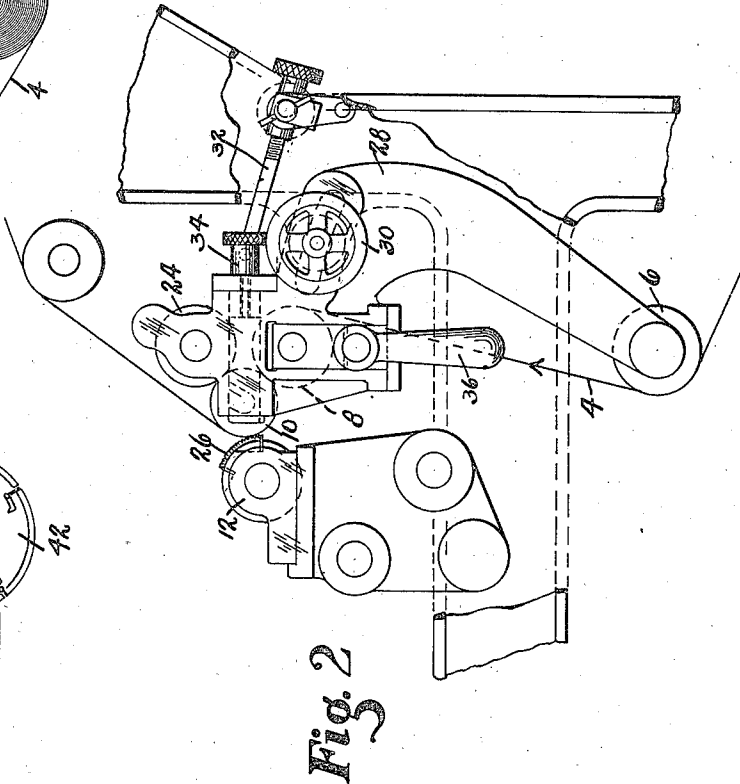
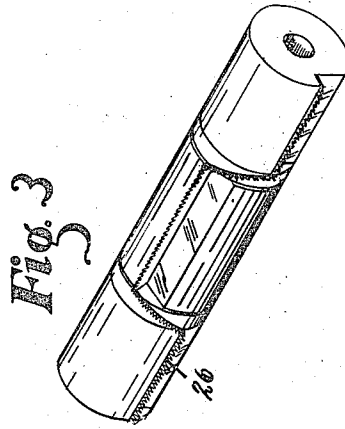
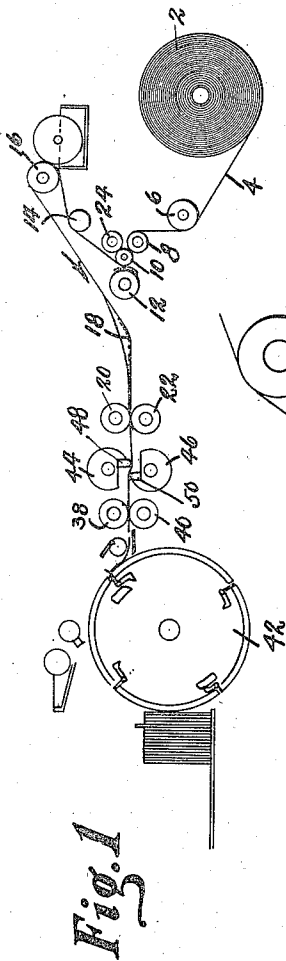


Fig. 2

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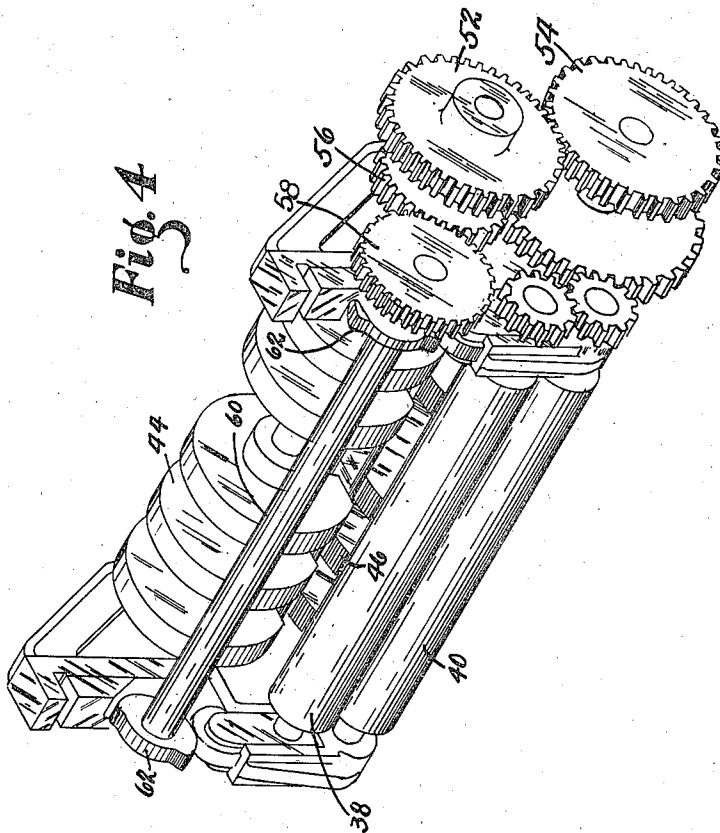
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METHOD AND APPARATUS FOR MAKING BAGS

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2 Sheets-Sheet 2



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2,285,228

METHOD OF AND APPARATUS FOR
MAKING BAGS

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17 Claims. (Cl. 164—84.5)

This invention relates to improvements in bag making, both in method and apparatus.

More specifically my invention relates to improved methods and apparatus for making bags such as shown and described in Snyder Patent 1,265,270 of May 7, 1918, wherein the bag is identical with that of Poppe Patent 1,952,891 of March 27, 1934; a further object of my invention being the production of this bag on machines of the general type disclosed by Potdevin Patents 1,941,272, dated December 26, 1933, and 2,087,704, dated July 20, 1937.

More specifically my invention relates to the perforating of the material in the web, tubing and separating the tubing into bag lengths.

After the tubing is divided into bag lengths, the latter may be pasted, folded and completed as set out, for example, in the Snyder patent, above referred to, page 2, column 1, beginning line 20.

In the accompanying drawings wherein I have illustrated an embodiment of my invention:

Fig. 1 is a somewhat diagrammatic view of a machine suitable for the practice of the invention;

Fig. 2 is an elevational view of the perforating mechanism;

Fig. 3 is a view in perspective of the perforating roll; and

Fig. 4 is an isometric view of the mechanism for dividing or separating the perforated tubing into bag lengths.

Referring to the drawings in detail: 2 designates a supply roll from which the web of material 4 is continuously drawn in practicing my invention.

The web 4 passes from the supply roll 2 about guide roll 6 over support and feed roller 8, between friction feed roller 8 and frictionally driven platen roller 10, and between the platen roller 10 and perforating roller 12 to guide roll 14, around the roller 16 to the tube forming shoe 18 and to the main feed or forwarding rolls 20 and 22.

The roll 8, already referred to, and roll 24 of the perforating mechanism are driven at the same surface speed as the main feed or forwarding rolls 20 and 22 and feed rolls 38 and 40.

The platen roll 10 of the perforating mechanism is rubber covered and is frictionally driven by its contact with the rolls 8 and 24.

The perforating roll 12 is provided with a perforating or weakening knife 26 which may be of any desired shape, depending upon the bag to be made, and it will be understood, of course, 55

that this roll will be of the proper diameter to correspond with the desired tube length, the perforating knife perforating the web 4 at bag length intervals.

The nest of rollers 8, 10 and 24 is adjustable as a unit toward and away from the perforating roller 12 to get the correct setting for proper perforating and to accommodate perforators of different diameters. This adjustable feature also compensates for changed diameters of the rubber-covered platen roller 10.

The roller 10 is independently adjustable with respect to the rollers 8 and 24.

It will be seen from an inspection of Fig. 2 that the nest of rollers 8, 10 and 24 is carried in an adjustable mount 28, and by loosening the wheel 30 and adjusting the rod 32 the roller nest may be adjusted as a unit toward or away from the perforating roller 12. The rubber-faced roller 10 is adjustable independently relative to the rollers 8 and 24 and with respect to perforating roller 12 through the adjusting rod 34.

A throw-off 36 is provided for the roll 8 to separate it from the roller 10 to provide for threading the machine.

The roller 10, as above mentioned, is friction driven, and may be of any desired diameter. For purposes of economy I prefer to make it rather small and inasmuch as this roller is subject to wear from the perforating knife, it will be evident that unless some provision is made to avoid it, replacement of the roller 10 would be frequent. By my construction this necessity is avoided. The roller is frictionally driven from the rollers 8 and 24, either one or both, so that it automatically adjusts itself to the surface speed of these rollers, these rollers, the rollers 8 and 24, backing the roller 10 to resist the pressure of the perforating knife 26. Due to this construction, therefore, the roller 10 may be resurfaced by turning, grinding or otherwise, any number of times without renewing it.

As above mentioned, the web after being perforated is fed to the tubing shoe 18 and to the forwarding rollers 20 and 22.

The tubing is fed by the forwarding rollers to separating mechanism which separates the tubing at the perforations or weakened areas into bag lengths. Various mechanisms have been suggested to separate bag tubing into bag lengths. The most common practice is to accelerate the tubing at some point between the forwarding rollers and the bottoming mechanism. However, as each bag machine is designed to make bags of many lengths, the surface speed of the feed

rollers which forward the tubing and the surface speed of the accelerating device vary with each bag length. For instance, in those machines where a bar traveling in a fixed orbit suddenly comes in engagement with the advancing tubing, a greater or less forward pull is exerted upon the tubing. When the bag tubing reaches the upper or long limit of the machine the accelerating or forward movement becomes very small in comparison with the tube speed imparted by the forwarding rolls, and if the tubing is of strong texture separation may not occur at all. On the other hand, when the short or lower limit of the machine is approached separation of the material is often improperly effected in that rupture of the material may occur adjacent the accelerating device if the material being operated upon is of delicate texture.

This trouble is overcome with my arrangement wherein no attempt is made to accelerate the tubing, but wherein a pressure is exerted on the tubing at opposite faces of the same at each side of the weakened line and in opposed directions. As will be seen from the description which follows, this provides that the same effort is applied to the tubing to separate the same at the perforations throughout the whole bag length range for which the machine is designed.

Referring to Figs. 1 and 4 of the drawings, it is to be noted that the feed rollers 20 and 22 advance the tubing, which has been perforated at bag length intervals while in the web, and feed rollers 38 and 40 periodically contact the advancing tubing and forward it in bag lengths to the bottoming mechanism 42. The surface speed of these feed rollers is the same as the surface speed of the forwarding rollers 20 and 22.

Intermediate these two pairs or sets of rollers is the separating mechanism for separating the tubing at the perforations or weakened line therein, thereby to separate the tubing into bag lengths. This mechanism comprises a pair of rollers 44 and 46 carrying separating bars 48 and 50 extending transversely of the bag tubing. These rollers are geared together by gears 52 and 54 and rotate at one revolution per tube length. The shaft for the roller 44 carries another gear 56 meshing with gear 58 on the shaft 60 carrying cams 62 for raising and lowering of the roller 38 once for each bag length. As above pointed out, the surface speed of the feed rollers 20 and 22 is the same as the surface speed of the feed rollers 38 and 40.

It is believed that the operation of the machine will now be understood.

As the web 4 passes through the perforating mechanism it is perforated or weakened at bag length intervals while in the web. The perforated web then advances through the tubing mechanism, forwarding rollers 20 and 22, through the separating mechanism and forwarding rollers 38 and 40, the latter gripping the leading end of the tubing just before the separating mechanism goes into action. After separation the bag lengths are advanced to the bottoming mechanism 42 by the rollers 38 and 40. As above pointed out, the rollers 44 and 46 carrying the separating bars 48 and 50 are rotating in opposite directions and at the same speed, and the web to be separated is advanced between these rollers by the forwarding rollers 20, 22 and 38, 40 which have the same surface speed, so that the bar 48 will engage the tubing at its upper face and at the same time the bar 50 will engage the tubing at its lower face. The bars 48 and 50

with the rollers 44 and 46 in the position shown in Fig. 1 are somewhat below and above a straight line extending from between the forwarding rollers 20, 22 to between the forwarding rollers 38 and 40. Consequently as the tubing extends from the forwarding rollers 20 and 22 to forwarding rollers 38 and 40 a downward pressure will be exerted thereon by the bar 48 simultaneously with an upward pressure exerted by bar 50 thereby to separate the tubing along the line of perforations. Bars 48 and 50 are adjustable with respect to the holders 44 and 46 and may be set to suit the material being run. Cams 62 are timed so that roller 38 releases the bag length as bottoming portion 42 takes hold of it.

It will be quite apparent that this provides for separation of the tubing without any acceleration of the tubing and without producing a slack in the tubing. As a consequence I am able to run the machine through the whole range of bag lengths for which it is designed, with the assurance that the separating operation will be the same for all lengths from maximum to minimum, so that separation will surely be effected at the perforations or weakened portion of the tubing regardless of the texture of the material of the tubing.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described without departing from the spirit and scope of my invention.

What I claim is:

1. In the separating of bag tubing into bag lengths, the method which comprises imposing downward pressure upon one face of the tubing at one side of a weakened line in the tubing and simultaneously imposing an upward pressure upon the other face of the tubing at the other side of the weakened line while the tubing is moving forward to separate the tubing along said weakened line.

2. In the separating of bag tubing into bag lengths, the method which comprises imposing pressures simultaneously in opposite directions upon the two faces of the tubing at each side of a weakened line therein while the tubing is advancing to separate the tubing along the weakened line.

3. The method of separating material along a weakened line therein, which method comprises imposing pressure upon one face of the material while the material is being forwarded at one side of the weakened line while imposing pressure in the opposite direction upon the opposite face of the material at the opposite side of the weakened line and without changing the rate of forwarding.

4. The method of separating material along a weakened line therein, which method comprises imposing pressure in opposite directions to the opposed faces of a taut length of the material and to each side of the weakened line to separate the same at a weakened line while the material is being advanced.

5. The method of separating material along a weakened line therein, which method comprises imposing pressure at each side of the weakened line and in opposite directions to the two faces of the material is being forwarded by forwarding rollers which clamp the material while the material at either side of the zone of application of the pressure.

6. The method of separating material along a weakened line therein, which method comprises imposing pressure in opposite directions to the

two faces of the material in advance and beyond the weakened line while the material is being forwarded and while the material at either side of the zone of application of the pressure is clamped.

7. The method of separating bag tubing into bag lengths along a weakened line in the tubing, which method comprises advancing the tubing under tension through two pairs of forwarding rollers rotating at the same surface speed, and then imposing pressure upon the two faces of the tubing in opposed directions to separate the same between the two pairs of forwarding rollers.

8. The method of separating bag tubing into bag lengths along a weakened line in the tubing, which method comprises advancing the tubing under tension through two pairs of forwarding rollers rotating at the same surface speed and then imposing pressure upon the two faces of the tubing in opposed directions and simultaneously at each side of the weakened line with the weakened line intermediate the two pairs of forwarding rollers, thereby to effect separation of the tubing along the weakened line.

9. The method of separating bag tubing into bag lengths at a weakened line in the tubing, which method comprises advancing the tubing at a constant speed by passing the tubing through two pairs of forwarding rollers rotating at the same surface speed, the material being under tension, and when the weakened line in the tubing advances to a point intermediate the two pairs of forwarding rollers rotating a separating bar into contact with opposite faces of the tubing simultaneously so that pressure is imposed upon the tubing in opposed directions substantially normal to the path of the tubing thereby to separate the tubing along the weakened line.

10. The method of separating bag tubing into bag lengths at a weakened line in the tubing, which method comprises advancing the tubing at a constant speed and with the tubing continuing its advance at this constant speed imposing rupturing tension upon the tubing near the weakened line thereby to effect the desired division.

11. In a bag making machine, mechanism for dividing bag tubing into bag lengths along a weakened line in the tubing, the combination of two pairs of forwarding rolls rotating at the same surface speed for advancing the bag tubing, and separating mechanism intermediate the forwarding rolls comprising a roller rotating adjacent each face of the tubing, said rollers rotating in opposite directions and a separating bar carried by each roller and adapted to engage the opposed faces of the tubing, said rollers being so timed with respect to the moving tubing that the separating bars will engage the tubing simul-

taneously, one bar engaging one face of the tubing, the other bar engaging the opposite face of the tubing at or near the weakened line.

12. In a bag making machine, mechanism for separating bag material into bag lengths along a weakened line in the material, the combination of two pairs of forwarding rollers rotating at the same surface speed for effecting the continuous advance of the bag material at a constant speed, separating mechanism intermediate the said forwarding rollers, said separating mechanism comprising a pair of rollers, each provided on its periphery with a separating bar disposed transversely of the advancing bag material, one roller lying adjacent one face of the bag material, the other roller lying adjacent the other face of the material, said bars extending into the path of the bag material, and being so disposed relatively that the bars will engage the opposite faces of the bag material simultaneously, one bar engaging one face of the material, the other bar engaging the opposite face of the material in the region of the weakened line.

13. In a bag making machine, means for perforating the bag material, comprising in combination a perforating roller, a platen roller cooperating therewith and a driven roller for frictionally driving the platen roller.

14. In a bag making machine, means for perforating the bag material, comprising in combination a perforating roller, a platen roller cooperating therewith and a pair of driven rollers engaging the periphery of the platen roller for frictionally driving the same.

15. In a bag making machine, means for weakening the bag material at bag length intervals, comprising in combination a weakening roller, a platen roller cooperating therewith and adjustable relatively thereto, and a driven roller for frictionally driving the platen roller.

16. In a bag making machine, means for weakening the bag material at bag length intervals, comprising in combination a weakening roller, a cooperating platen roller, a roller frictionally engaging the platen roller for driving the same, and a throw-off for said driving roller permitting separation of the platen and driving rollers to facilitate threading of the machine.

17. In a bag making machine, means for weakening the bag material at bag length intervals, comprising in combination a weakening roller, a platen roller cooperating therewith, a roller engaging the platen roller frictionally to drive the same, a common mount for the two last mentioned rollers, and means for adjusting said mount to vary the setting of the platen roller with respect to the weakening roller without interrupting the friction drive for the platen roller.

ADOLPH POTDEVIN.

CERTIFICATE OF CORRECTION.

Patent No. 2,285,228.

June 2, 1942.

ADOLPH POTDEVIN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, lines 70 and 71, claim 5, strike out the words "while the material" and insert the same before "is" in line 69, same claim, and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of July, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.