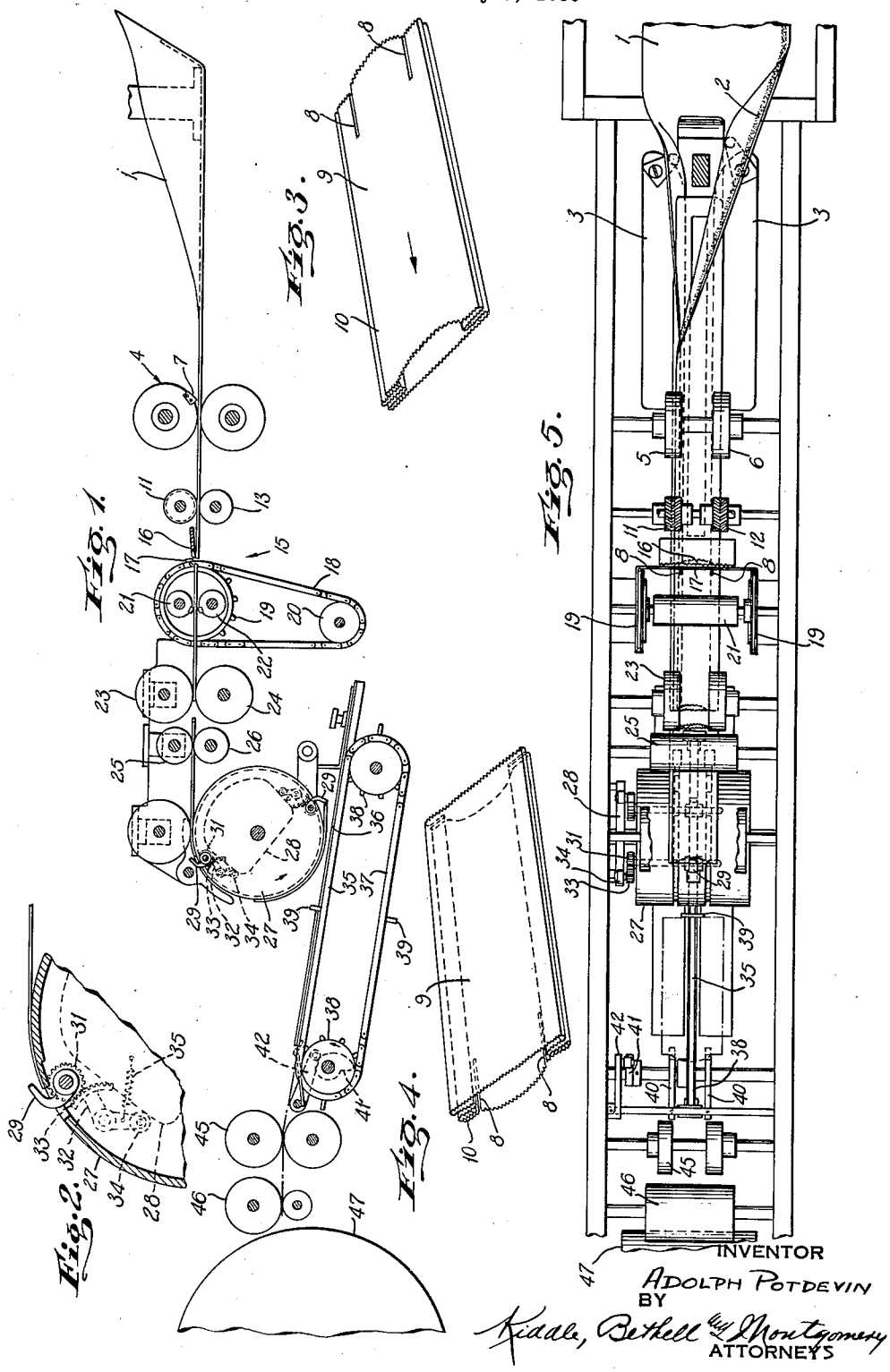
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METHOD OF AND APPARATUS FOR MAKING BAGS

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METHOD OF AND APPARATUS FOR MAKING BAGS

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This invention relates to improvements in bag making machines and has for one of its objects the provision of a machine for the making of paper bags in which after the tubes from which the bags are made have been cut off to the desired length, the bag length in its continued travel in one direction is inverted, i. e. turned upside down to bring the seam side of the bag length on the bottom and is turned end for end to facilitate the bottoming operation.

My Patent No. 1,953,432 of April 3, 1934 discloses a machine for making a similar type of bag. However, in that machine the bag length is not turned end for end and in inverting the bag, i. e. turning it upside down, it is necessary to provide means, as a conveyor for example, which moves the bag length out of its normal line of travel and brings it back into this path again in inverted position. In the present structure, however, I have provided a construction wherein the bag length is not moved laterally thereby saving materially in floor space, yet at the same time accomplishing the desired end, that is, a turning of the bag length upside down and turning of the bag end to end.

In the drawing:

Fig. 1 is a diagrammatic view of my improved machine;

Fig. 2 is an enlarged fragmentary view of the gripping mechanism;

Fig. 3 is a perspective view of a bag length in the position it assumes after the cutting operation and before inversion;

Fig. 4 is a similar view of the bag length after the same has passed the inverting mechanism; and

Fig. 5 is a plan view of the machine of Fig. 1.

Referring to the drawing in detail, 1 designates a web of material which may be paper, glassine, "cellophane" or the like and which is taken from a supply roll (not shown). One edge of this web is provided with a stripe of adhesive 2 in a well known manner. The web then passes to tubing mechanism which may be of usual construction, and from thence to slitting mechanism 4 comprising rollers 5 and 6, each of which is provided with knives 7 on their peripheries. As the tube passes beneath these rollers, the same is slit longitudinally as shown at 8 in Fig. 3, these slits being made in the same panel 9 as the side seam 10.

After the slitting operation the tube passes between upper pressure rollers 11 and 12 cooperating with a lower roller 13. The roller 11 it will be noted overlies the tube seam 10. The peripheries of the rollers 11 and 12 are herring-boned. As the tube passes through the machine, the edges thereof are subjected to the pressing action of the rollers 11 and 12 and due to the herring-bone formation of the faces of these rollers, I am assured that the entire face of the web is subjected to pressure thereby closing the same throughout its entire length.

The tube next passes to the cutting-off mechanism shown at 15. This mechanism comprises a stationary knife 16 and a movable striker bar 17. The striker bar 17 is carried on sprockets 18 which in turn are carried by sprocket wheels 19 and 20. During the severing operation pinch rollers 21 and 22 come into operation to hold the web during the severing operation in a well known manner, and the tube is severed at such position that the slits in the severed bag length are at the trailing end. The bag length next advances to forwarding rollers 23 and 24 and presser rollers 25 and 26.

With the bag length moving longitudinally in a forward direction it passes from rollers 25 and 26 to the mechanism which is to invert the bag length, that is, turn it upside down and end for end. This mechanism comprises a rotatable drum 27, stationary cam 28, gripping fingers 29 and 30 pivotally mounted on the drum for rotation therewith, a pinion 31 on the shaft of the gripping fingers, a pivotally mounted arm 32 having a segment 33 at one end and a roller or cam follower 34 at its other end. A spring 35 is provided for maintaining the cam follower in engagement with the cam 28. As the leading end of the bag length, i. e., the end opposite the slitted end, reaches the drum 27 the gripping finger 29, as seen in Fig. 1, will be open to receive the end of the bag length and on further rotation of the drum the cam follower 34 will ride off the cam 28 under the action of spring 35 thereby pivoting the arm 32 which in turn will move the segment 33 to rotate the pinion and gripping finger to gripping position. The drum continuing its rotation will advance the bag length longitudinally, but in a curved path, carrying the bag length around until the cam follower 34 again engages the cam 28 when the arm 32 will again be rocked to rock the segment 33 and cause the finger to open and release the bag length. The bag length is then free to drop in inverted position and with the slitted end now leading upon a conveyor belt 36, driven by means of a sprocket 37 carried by sprocket wheels 38, again to move forward lengthwise toward the bottoming mechanism. The conveyor belt is pro-

vided with stops 39 for engaging the bag length to insure movement of the same with the conveyor belt.

It will be obvious from the foregoing that what was formerly the trailing end of the bag length is now the leading end and that the seam wall of the bag which is the slitted wall is now in contact with the conveyor belt.

It will be seen from Figs. 1 and 5 that I have provided fingers 40 which are adapted to be oscillated by a cam 41 through a cam follower 42. The purpose of these fingers is to remove the bag length from the conveyor belt and guide the same toward forwarding rollers 45 and 46 to the bottoming mechanism diagrammatically illustrated and designated 47.

It will be understood from all of the foregoing that in the present construction the bag length is always moving endwise and never laterally as in my Patent No. 1,953,432, and that while the slits originally were in the trailing end of the bag length, the bag length is reversed end for end so that it comes up to the bottoming mechanism with the slitted end in the lead.

It will be understood that while I have illustrated and described one embodiment of my invention, I do not wish to be limited to this precise structure as obviously various modifications and changes may be made therein without departing from the spirit and scope of my invention.

What I claim is:—

1. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, and means in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement while maintaining the same in its lengthwise path.

2. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting the seam wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, and means in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement while maintaining the same in its lengthwise path.

3. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, means in the path of travel of the bag lengths for turning the bag length end for end during its lengthwise movement, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

4. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, means in the path of travel of the bag lengths for inverting the bag length and turning it end for end during its lengthwise movement, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

5. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at the trailing end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, and means in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement while maintaining the same in its lengthwise path.

6. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting the seam wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at the trailing end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, and means in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement while maintaining the same in its lengthwise path.

7. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at the trailing end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, means in the path of travel of the bag lengths for turning the bag length end for end during its lengthwise movement to bring the slits at the leading end of the bag length, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

8. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting the seam wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at the trailing end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, means in the path of travel of the bag lengths for inverting the bag lengths and for turning the bag lengths end for end to bring the slitted end in the lead, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

9. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, a drum in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

10. A machine of the class described, com-

prising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, a rotating member in the path of travel of the bag lengths and having gripping fingers for engaging the leading end of the bag length to attach the bag length to the rotating member thereby to invert each bag length and turn the same end for end, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

11. A machine of the class described, comprising in combination tube forming mechanism, means for advancing the tube, slitting mechanism for slitting one wall of the moving tube, severing mechanism for severing the tube into bag lengths with the slits at one end of the bag length, forwarding mechanism for forwarding the bag lengths lengthwise to a bottoming station, a drum rotating about an axis transverse to the direction of travel of the bag lengths and in the path of travel of the bag lengths for inverting the bag length during its lengthwise movement, bottoming mechanism, and means for continuously advancing the bag length to said bottoming mechanism.

12. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube, means for continuously advancing the tube endwise, means for severing the tube at intervals to provide bag lengths with slits in one end thereof, forwarding mechanism for forwarding the bag lengths endwise, a rotating member in the line of travel of said bag lengths, and cam actuated means for gripping the leading end of the bag length and carrying the same around with the drum and then releasing the same in inverted position with the slitted end in the lead.

13. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube, means for continuously advancing the tube endwise, means for severing the tube at intervals into bag lengths with slits at the trailing end, forwarding mechanism for forwarding the bag lengths endwise, a rotating member in the line of travel of said bag lengths, and cam actuated means for gripping the leading end of the bag length and carrying the same around with the drum and for releasing the bag length in inverted position with the slitted end in the lead, and a conveyor belt below said rotating member for receiving the released inverted bag lengths and for conveying the same endwise to a bottoming station.

14. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube in the seam wall thereof, means for continuously advancing the tube endwise, means for severing the tube at intervals to provide bag lengths with slits at the trailing end, means for continuously advancing said bag lengths endwise, a drum in the line of travel of said bag lengths, cam actuated means for attaching the leading end of each bag length to the drum, so that the same is carried around with the drum and released in inverted position, a conveyor belt directly below said drum for receiving the inverted bag length and conveying the same endwise toward a bottoming station, and means for removing the bag length from said conveyor belt.

15. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube in the seam wall, means for continuously advancing the tubing endwise, means for severing the tubing at intervals to provide bag lengths having slits at the trailing end, a rotating drum in the line of travel of said bag lengths, a stationary cam, a pivotally mounted arm and a finger carried by said drum, said finger being actuated by said cam through said arm to grip the unslitted end of the bag length and carry the same around with the drum during a partial rotation thereof and then to release the same in inverted position, and a conveyor belt directly below said drum for receiving the inverted bag length and for conveying the same endwise to a bottoming station.

16. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube in the seam wall, means for continuously advancing the tubing endwise, means for severing the tubing at intervals to provide bag lengths with slits at the trailing end, a rotating drum in the line of travel of said bag lengths, a gripping finger pivotally mounted on said drum, a pivotally mounted arm cooperating with said finger, a pinion integral with said finger, a segmental gear carried by said arm and meshing with said pinion, a cam for actuating said arm to open and close said finger, said finger closing on the unslitted leading end of each bag length so that the bag length is carried with the drum for a partial revolution and released in inverted position.

17. A machine of the class described, comprising in combination tube forming mechanism including means for seaming the tube, slitting mechanism for slitting the tube in the seam wall, means for continuously advancing the tube endwise, means for severing the tubing at intervals to provide bag lengths with slits at the trailing end, a rotating drum in the line of travel of said severed bag lengths, a gripping finger pivotally mounted on said drum, a pivotally mounted arm cooperating with said finger, a pinion integral with said finger, a segmental gear carried by said arm and meshing with said pinion, a cam for actuating said arm to open and close said finger, said finger closing on the unslitted leading end of said bag length, to attach the bag length to the drum for a partial revolution and then to release the same in inverted position, and a conveyor belt directly beneath said drum for receiving said inverted bag length and for conveying the same endwise to a bottoming station.

18. A machine of the class described, comprising in combination tube forming mechanism, slitting mechanism for slitting the tubing in the seam wall, means for continuously advancing the tubing endwise, means for severing the tubing at intervals to provide bag lengths, a rotating drum in the line of travel of said severed bag lengths, gripping fingers carried by said drum for clamping the unslitted leading end of the bag length to said drum, a stationary cam, a pivotally mounted arm for each of said fingers carried by said drum, a cam follower on one end of each arm cooperating with said cam, a pinion integral

with each of said fingers, a segment on each of said arms cooperating with said pinions, a spring on each of said arms for maintaining the same in contact with said cam, said fingers opening automatically when the drum has completed one half a revolution to release the bag length in inverted position, a conveyor belt directly below said drum for receiving the inverted bag length and conveying the same with its slitted end in the lead to a bottoming station, and means for removing the severed bag length from said conveyor belt.

19. The method which comprises tubing a continuously advancing paper web, dividing the advancing tubed web into bag lengths, effecting lengthwise movement of the bag lengths to a bottoming station and during this continuous lengthwise movement reversing the direction of travel of the bag length to invert the same and at the same time turning the bag length end for end, and then continuing the advance of the bag length to the bottoming station in its original direction of travel but in an inverted position.

20. The method which comprises tubing a continuously advancing paper web, dividing the advancing tubed web into bag lengths, advancing the bag lengths in a curved path to invert the lengths so that the leading end becomes the trailing end, and continuing the advancing of the bag lengths in a straight line to bottoming mechanism.

21. The method which comprises tubing a continuously advancing web, slitting the tubing, dividing the tubing into bag lengths with the slits at the trailing end thereof, forwarding the bag lengths continuously toward bottoming mechanism and during this movement reversing the direction of travel of the bag length to invert the bag length and then continuing the advance of the bag length in its original direction of travel with the slitted end thereof in the lead.

22. The method which comprises tubing a continuously advancing paper web, dividing the advancing tubed web into bag lengths, forwarding the bag lengths to a bottoming station and during the forward movement of the bag lengths inverting the same and turning it end for end.

23. The method which comprises tubing a continuously advancing paper web, dividing the adcancing tubed web into bag lengths, effecting endwise movement of the bag lengths to a bottoming station and during this endwise advance inverting the bag length and turning it end for end.

24. The method which comprises tubing a continuously advancing paper web, dividing the advancing tubed web into bag lengths, effecting endwise movement of the bag lengths to a bottoming station and during this endwise movement reversing the direction of travel of the bag length to invert the same and turning it end for end.

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