This invention relates to an improvement in bag making methods and bag making machines, and is particularly directed to an improvement in the making of valve bags and in machines of the type adapted for use in connection with the making of valve bags. In the making of valve bags as practiced heretofore it is customary to form a tube, and while the tube is advancing to sever the same into bag lengths, this same operation is omitted a projecting flap at one side of the end of the bag length, this flap afterward being tucked to provide a so-called valve. The tube from which the bag lengths are severed is advanced by friction rolls and slippage of the tube is unavoidable, consequently it is difficult to maintain the bag lengths the proper length.

In the present invention I overcome this difficulty by successively advancing the web through tube forming and bag length cutting operations, the severed bag lengths being relocated before passing through the valve flap forming operation, so that while the bag lengths may vary in length due to fault in the cutting-off or bag length forming operation, this variation will be taken care of in the flap forming operation so that the bag lengths will be uniform. This is very important because in the subsequent sewing operation machines with opposite sewing heads are often used and any variation in the length of the bag length leads to trouble in sewing the bags.

Fig. 1 is an elevational view of an embodiment of a machine adapted for the practice of my invention:

Fig. 2 is a plan view of the machine of Fig. 1:

Fig. 3 is a plan view of the tube forming portion of the machine; and

Figs. 4 and 5 are views in perspective of bag lengths in two stages of formation.

Referring to the drawings in detail, the stock in web form from which bags are to be made has a coating of adhesive applied adjacent one edge thereof and is advanced through tube forming mechanism T of usual construction progressively to be formed into a tube 2, the tube being advanced by driven feed rollers 1, the speed of these rollers being determinative of the bag lengths to be cut from the tube 2. The tube is forwarded or advanced between upper and lower pinch rolls 3 and 4 and from thence passes to the cutting-off or severing mechanism where the bag lengths are cut from the tube.

The cutting-off mechanism comprises positively driven upper rotor 5 and cooperating positively driven lower rotor 6 mounted for adjustment circumferentially on shafts 5' and 6', respectively, the upper rotor 5 carrying the knife 7.

Following the cutting-off mechanism is a pair of overspeeded forwarding rollers 8.

The linear speed of the cutting-off mechanism is in relation to the pinch rolls remains constant, and the adjustable mounting of the cutting-off mechanism and the pinch rolls permits of these two sets of devices to be properly set relatively to each other so that at the instant of cutting off the tube will be gripped between the pinch rolls.

The operation of the cutting-off mechanism, as will be understood, is to sever a section or bag length from the tube 2, such bag length having been designated 9, and from Fig. 4 it will be seen that the tube is severed square across, that is to say, free of any valve flaps.

Following the forwarding rollers 8 are a plurality of chains 10 mounted on sprockets 11 and traveling in the direction of advance of tubing 2.

Three of these chains are shown in the drawings but the number may be varied as desired. These chains each carry lugs 12, any number desired. The timing of these chains and lugs is accomplished by the set screw 11A in gear 11B which is mounted on shaft 11C which shaft also carries the sprockets 11 through which the chains 10 are propelled.

As will be apparent from an inspection of Figs. 1 and 2 the lugs are aligned transversely of the machine.

At each side of the chains 10 are adjustable guide plates 14 mounted for lateral adjustment.

The chains 10 as will be apparent receive the bag lengths 9 as they issue from between the forwarding rollers 8 and forward the bag lengths toward the valve-flap forming apparatus.

Adjacent the discharge end of the chains 10 are pinch rolls 15 and 16 for holding the bag lengths during the flap forming operation, the upper rolls 15 being mounted on a shaft 17 which is provided with a cam 18. This cam is adapted to engage an arm 19 affixed to a shaft or rod 20 extending transversely of the machine and located over the discharge end of the chains 10. This shaft or rod, as will be seen from the drawings, carries a plurality of stop fingers 21. A spring 22 at one end is attached to the arm 19 and has its other end attached to any suitable part of the machine frame, this spring holding the free end of the arm 19 always in contact with the cam 18. By the provision of the cam 18 and spring 22 it will be apparent that the shaft 20 is caused to rock to raise and lower the free ends of the fin-
2 gers 21, into and out of the path of the bag lengths as they are advanced by the chains 10.

Following the pinch rolls 15 and 16 is a pair of driven forwarding rollers 23 adapted to advance the bag lengths 9 successively to the valve-flap forming mechanism.

This valve-flap forming mechanism comprises a rotor 24 carried by a shaft 25, this rotor being adjustable circumferentially of its shaft and carrying a slitter 26 and cut-off knife 27. The cooperating part of the valve-flap forming mechanism comprises a rotor 28, adjustable circumferentially of its shaft 29 and carrying members 30 and 31 cooperating, respectively, with the slitter 26 and cut-off plate 27. The slitter 26 is for the purpose of slitting the bag lengthwise along 32 (see Fig. 5), while the cut-off blade 27 cuts the bag length transversely along 33 (see Fig. 5) so that a section, which I shall designate 34, is cut from the end of the bag length to leave a valve flap 35 at the end of the bag length, this flap as will be seen from Fig. 5 being located at one side of the end of the bag length. The bag lengths are discharged successively from the machine by discharge rollers 36.

From the foregoing it will be appreciated that the advancing tube is gripped by the slower moving pinch rolls 3 and 4 thus bringing the speed of the tube down to that of the pinch rolls which speed is always less than the speed of the cutting-off mechanism. During this period slack will form in that part of the tube lying between the feed rollers 1 and the pinch rolls, but after release by the pinch rolls, the tube under the urge of the overspeeded forwarding rollers 8 will again resume feed roller speed.

After the cutting-off mechanism has functioned the bag lengths 9, as above pointed out, are discharged successively upon the chains 10 and advanced to the stop fingers 21, the cam 18 on the shaft 17 of the pinch roll 15 being so set that the fingers 21 will be in their lowermost position upon the arrival of the leading end of a bag length.
The bag length is then held against further advance until engaged by the next lugs 12 and until the fingers 21 are raised out of the way, and inasmuch as the chains 10 and the mechanism for engaging the chains are positively driven, the bag lengths, by the provision of chains 10, lugs 12 and fingers 21 are set or positioned with respect to the flap forming mechanism.

Consequently upon lifting of the fingers 21 each bag length is again advanced and forwarded to the valve-flap forming mechanism in predetermined relation thereto, so that despite any variations existing in the bag lengths this is taken care of or compensated for so that the finished bag lengths as discharged from the machine are all of the same length from 37 to 38.

From all the foregoing, therefore, it will be appreciated that the paper web is successively passed through tube forming and cutting-off operations to provide bag lengths, these bag lengths being relocated by the chains and lugs 10 and 12 and fingers 21 before passing to the flap forming operation.

It is to be understood that changes may be made in the details of construction and arrangement of parts above described within the purview of my invention.

What I claim is:

1. The method of making valve bags which comprises progressively forming a web into a tube, the web being continuously advanced, severing the continuously advancing tube during its forward travel into bag lengths, and forming projecting valve flaps on the leading end of the bag length after the severing operation.

2. The method of making valve bags which comprises progressively forming a web into a tube as the web is continuously advanced, severing the continuously advancing tube during its forward travel into successive bag lengths, and forming projecting valve flaps on the leading end of each bag length as they move forward after the severing operation.

3. The method of making valve bags which comprises advancing the web through successive tube forming and bag length cutting operations, halting the advance after the cutting off operation and then again advancing the bag length through valve flap forming mechanism.

4. The method of making valve bags which comprises continuously advancing a length of bag tubing and cutting the continuously advancing tube into successive single bag lengths, thereafter forming lateral valve flaps projecting from the leading end of successive bag lengths.

5. The method of making valve bags which comprises continuously advancing a length of laterally pleated tubing, cutting the continuously advancing pleated tubing into successive single bag lengths, and thereafter forming a valve flap on the leading end of each bag length in the laterally pleated area of the tube.

6. The method of making valve bags which method comprises advancing the web successively through tube forming and bag length cutting operations, relocating the severed bag length and then forming the valve flap.

7. The method of making valve bags which comprises progressively forming a web into a tube, severing the tube during its forward travel into successive single bag lengths, and thereafter forming a lateral valve flap projecting from one end of the bag length.

8. The method of making valve bags which comprises progressively forming a web into a laterally pleated tube, severing the tube during its forward travel into successive single bag lengths, and thereafter forming a valve flap projecting from one end of the bag length in the laterally pleated area thereof.

9. In a bag machine means for advancing a tube continuously, means for cutting the continuously advancing tube into successive single bag lengths, and means thereafter to form a lateral valve flap projecting from one end of each of the bag lengths.

10. A bag machine comprising means for continuously advancing a laterally pleated tube, means for cutting the continuously advancing laterally pleated tube into successive single bag lengths, and means thereafter to form a lateral valve flap projecting from one end of each of the bag lengths.

11. A bag machine comprising means for advancing a tube continuously, rotary cutter means for severing the continuously advancing tube into successive single bag lengths, and means thereafter to form a lateral valve flap projecting from one end of each of the single bag lengths.

12. A bag machine comprising means for continuously advancing a length of bag tubing, means for cutting the advancing tubing into successive single bag lengths, and means thereafter to form a lateral valve flap projecting from one end of each bag length.

13. A bag machine comprising means for continuously advancing a length of laterally pleated
bag tube and means for cutting the continuously advancing tubing into successive single bag lengths, and means thereafter to form a projecting valve flap in the laterally pleated area of each bag length.

14. A bag machine comprising means for effecting the continuous advance of bag tubing, rotary mechanism for cutting the tubing into bag lengths as the tubing is advanced, said rotary mechanism comprising a transverse knife for severing the tubing transversely into bag lengths, a roller carrying said knife; a second roller, a transverse knife parallel to the first knife and carried by said second roller, said second knife extending from the edge of the bag length partially across the width of the same, and a knife carried by the said second roller lying in a plane normal to the plane of the said second knife, the two last mentioned knives forming a lateral valve flap projecting from the end of the bag length.

15. A bag machine comprising means for advancing a tube continuously, rotary cutting mechanism for severing the continuously advancing tube into successive single bag lengths, means for advancing the bag lengths, and rotary cutting mechanism to receive said bag lengths and to form a lateral valve flap projecting from one end of each of the single bag lengths.

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