

March 21, 1939.

R. E. PIERCE

2,151,438

CLIPPER

Filed Oct. 31, 1936

3 Sheets-Sheet 1

FIG. 1.

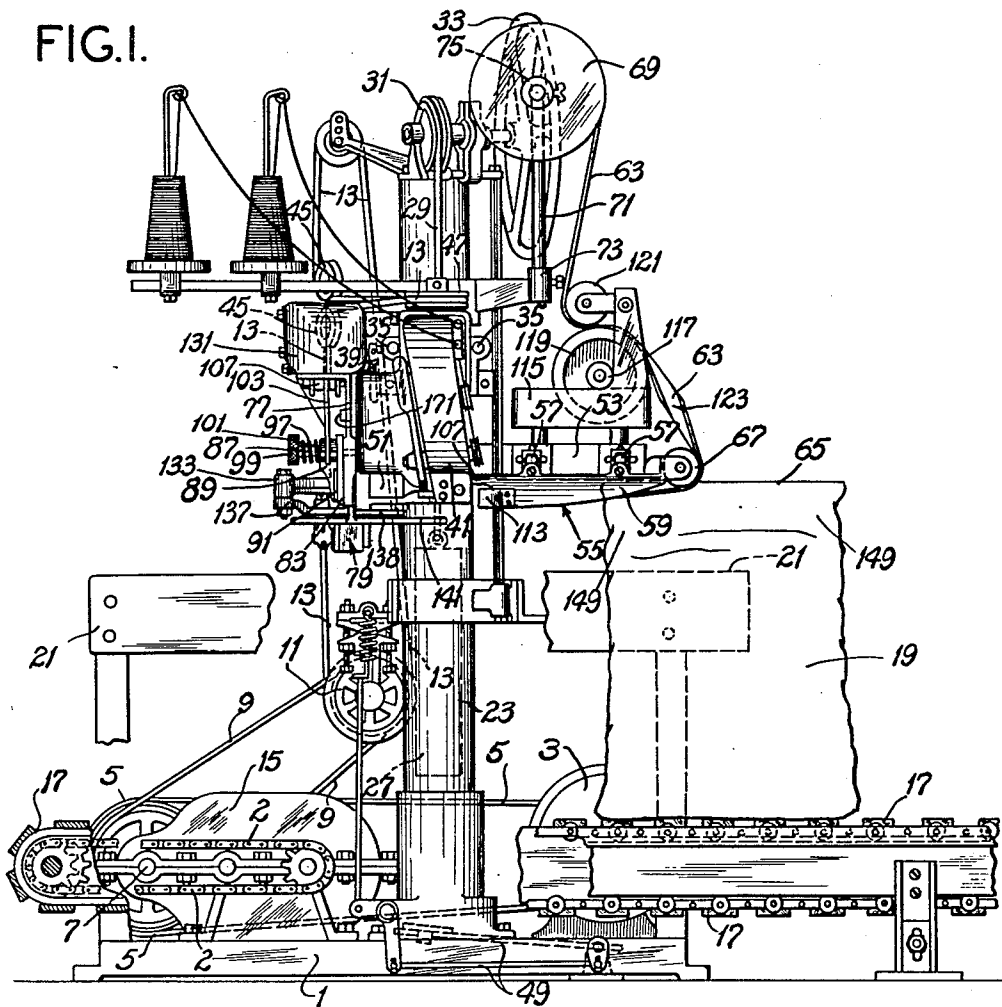
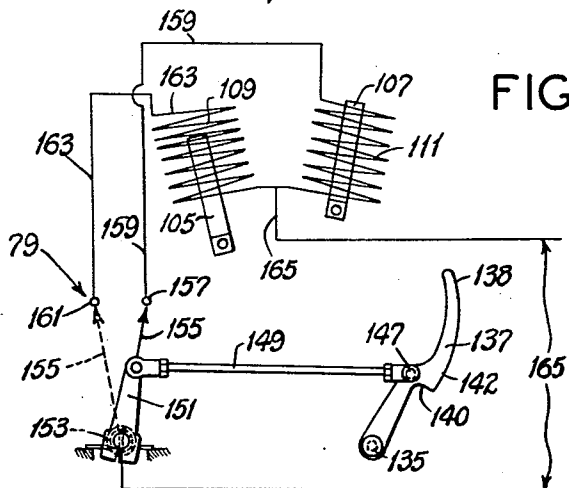


FIG. 6.



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FIG. 2.

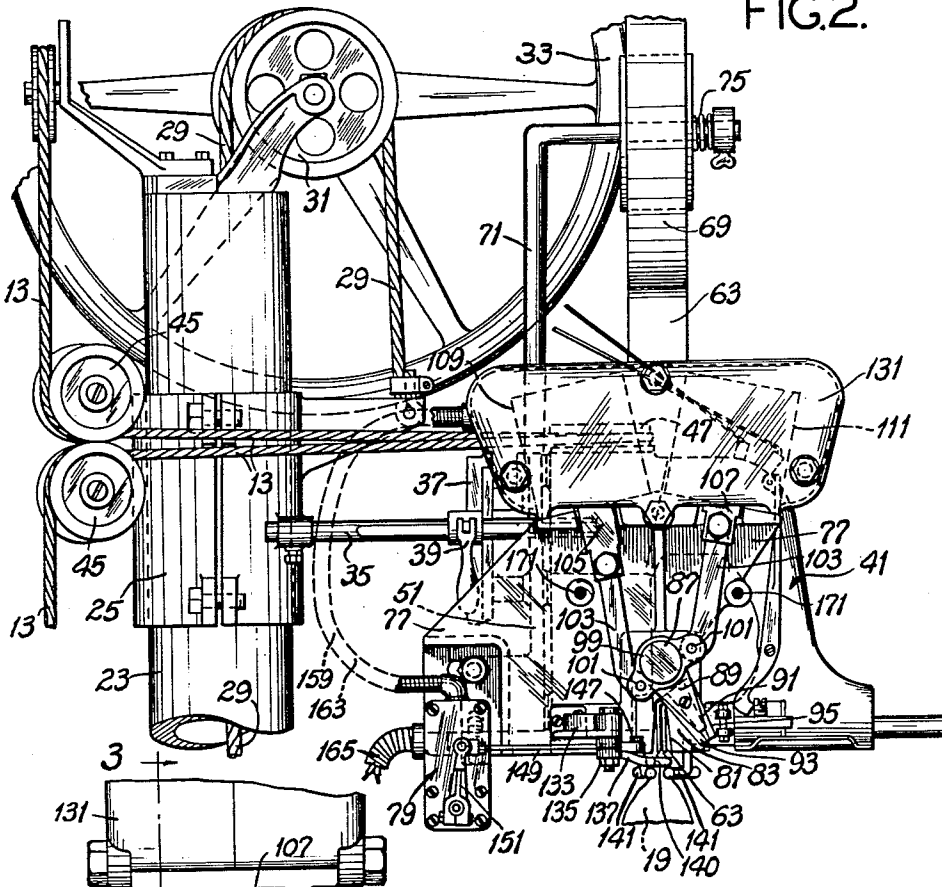
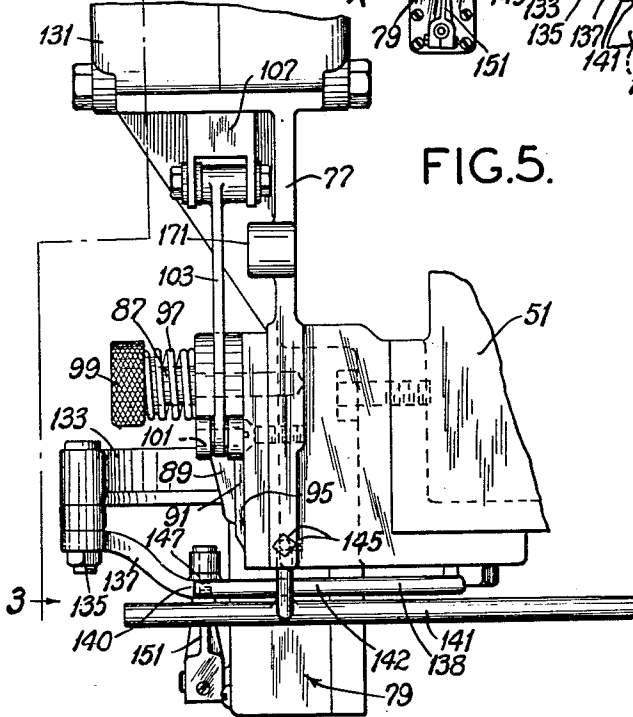


FIG. 5.



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Filed Oct. 31, 1936

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FIG. 3.

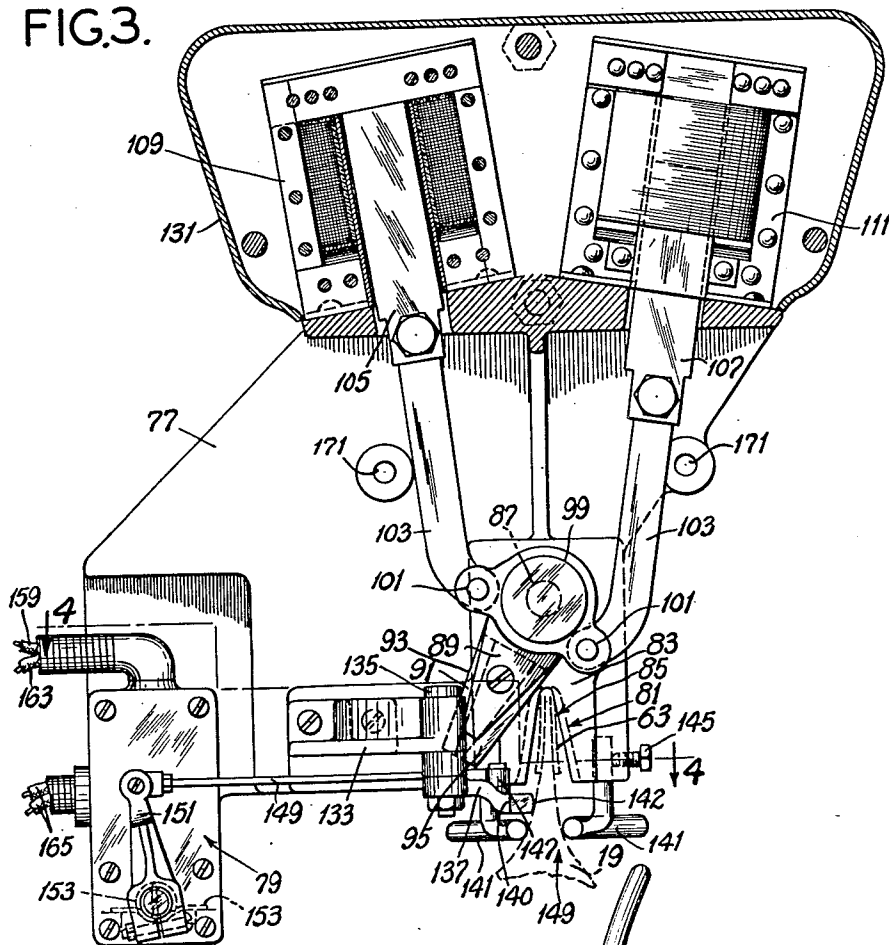
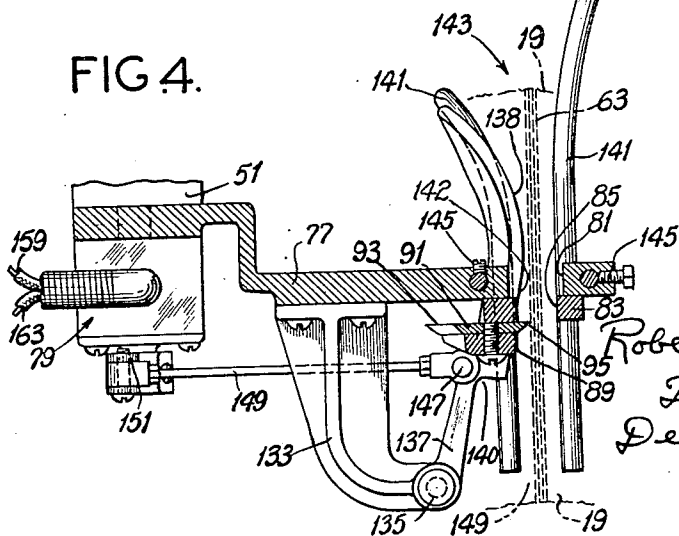


FIG. 4.



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UNITED STATES PATENT OFFICE

2,151,438

CLIPPER

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Application October 31, 1936, Serial No. 108,569

5 Claims. (Cl. 112—252)

This invention relates to clippers or tape cutters, and with regard to certain more specific features, to a clipper for use on apparatus which with a continuous length of material joins a plurality of articles which are thereafter to be separated, as for example apparatus which continuously tapes shut the open mouths of successive, filled bags or the like.

This invention is an improvement upon the apparatus disclosed in United States Patent 1,796,494, issued to C. S. Thompson on March 17, 1931.

Among the several objects of the invention may be noted the provision of an automatic tape cutter for taping machines in which continuous tape is applied successively to the open mouths of filled bags, such bags either being applied to the machine manually and therefore at irregular intervals, or applied at regular intervals; the provision of a tape cutter of the class described which only twice cuts the variable or invariable length of tape between successive bags, one cut being near the back of a preceding bag and one cut being close to the front of a succeeding bag; the provision of a tape cutter of the class described which will not cut the intervening length of tape between bags into more than one length; and the provision of apparatus of the class described which is simple in form and in operation. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a front elevation of a taping machine, showing the invention applied thereto, parts being broken away for clarity;

Fig. 2 is a fragmentary, enlarged, left-end view of Fig. 1;

Fig. 3 is a further enlarged view of the cutter elements of Fig. 2, the cutter being shown in an alternative position, the view being also a section taken on line 3—3 of Fig. 5;

Fig. 4 is a horizontal section taken on line 4—4 of Fig. 3;

Fig. 5 is an enlarged, front elevation of the cutter parts of Fig. 1; and,

Fig. 6 is a wiring diagram.

Similar reference characters indicate corre-

sponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a supporting base for a motor 3, which, through a drive 5 moves a counter-shaft 7 supported on the other end of base 1. The countershaft 7 has a drive 9 for actuating a mechanism 11 which drives a belt 13 for operating the sewing head to be described. The counter-shaft 7 also operates a speed-reducing mechanism 15, which, through drive 2, drives a conveyor 17 for the purpose of advancing the filled bags 19. A support 21 holds the bags in upright position as they are moved by the conveyor.

On the base 1 is supported a hollow column 23 which carries a vertically adjustable bracket 25 (Fig. 2). The bracket 25 is connected to a counter-weight 27 in the column (Fig. 1). The connection is made by means of a rope 29 looped twice about a pulley 31, the latter being on a control shaft operable by a hand wheel 33. The bracket 25 carries guides 35 upon which is located a slidable keystone plate 37 adapted to be locked in position by locking clamps 39.

Ordinarily, there is mounted directly on the keystone plate 37 a sewing machine head 41, to be particularized hereinafter. The attachment herein described is made directly to said keystone plate 37, and said sewing machine head is then applied over the attachment.

The said sewing machine head 41 is of known type and is driven in any of its vertically adjusted positions by means of a belt 13 which is driven from said drive 11. The belt 13 passes over aligning idlers 45 attached to the bracket 25, and then over the driven pulley 47. By this means the sewing machine head 41 may be driven to operate at any of various elevations of the bracket 25. A suitable control mechanism 49 (Fig. 1) is used for starting the drive 11 and the conveyor 17. In one position of the control 49, the sewing machine head 41 and the conveyor are simultaneously energized.

The above broadly outlined structure has already been described in more detail in said patent above mentioned, and further details will not be repeated herein.

The invention per se comprises a tape cutting attachment to be applied between the sewing machine head 41 and the keystone plate 37.

At numeral 51 is shown a sub-base which is held between said keystone plate 37 and the sewing machine head 41, suitable bolts passing from the sewing machine head, through the sub-base

51 and to the keystone plate, thereby clamping the head in place.

The sub-base 51 is extended to form a bracket 53. The bracket 53 extends in the direction opposite to the advance of the bag on the conveyor and this will be referred to hereinafter as being to the right. This bracket 53 supports a folder 55. The folder 55 is attached to the bracket 53 by means of bolts and double slot adjustments 57, the adjustment being both longitudinal and vertical and independent, whereby the folder 55 may be elevated, depressed, moved backward and forward and longitudinally angled for best operation.

The folder 55 comprises a pair of channel-forming members 59 providing a converging form adapted to receive a horizontal, flat strip of tape 63 and to fold the same over the mouth of an advancing bag 19. The tape, as shown, folds over the juxtaposed sides of a bag mouth 65, said sides traversing the interior of the folder by reason of the action of the conveyor 17 in moving the bag together with the action of the feeder on the sewing machine. The adjustment of the elevation of the folder 55 is such that the bag mouth, when the sides are brought together tends naturally to push up under the folder.

The tape 63 enters the folder over an idling roller 67 which is rotatable on the inlet end of the folder 55. The tape 63 is fed to the idler 67 from a supply roll 69 on a bracket 71, the latter being held in a socket 73 of the sub-base 51. A frictional tensioning device 75 serves to prevent undesirable unravelling of the tape.

In Fig. 1 is shown means for applying adhesive to the side of the tape 63 which is to become the inside of the subsequent fold. This comprises an adhesive well 115 supported on the bracket 53 and extending over the folder 55. This well carries bearings 117 for rotatably supporting a roll 119. An idler 121 is used for bringing one side of the tape 63 into contact with the roll 119. Between the roll 119 and the idler 67 the tape is given a half twist 123 so that the adhesive side will be down after the idler 67 is passed and the dry side against idler 67. Thus, the adhesive side of the tape is presented to the material of the bag mouth as it enters the folder.

It will be understood that the adhesive applicator may be eliminated and the tape threaded directly from the roll 69 to the idler 67. In this case dependence for closing the bag mouth is placed upon stitching only instead of adhesive and stitching, as above indicated. Or, attachment may be made by adhesion only, and without sewing, so far as the present invention is concerned.

In order that the tape may be properly pressed to the bag mouth as the combination of tape and bag mouth leaves the folder 55, there is provided a pressure leaf spring 113 which extends into the open space beneath the extension 107 of the folder 55 and positioned just ahead of the presser foot of the sewing machine head 41. By this means the bag mouth with the folded tape, which is presented beneath the presser foot of the sewing machine, is in a flat condition, so that proper sewing may be carried out at that point. After sewing, the bag passes on to the remainder of the apparatus.

At the left of the sub-base 51 is attached a bracket 77 which carries a switch box 79. This bracket 77 is also formed with a V notch 81 through which passes the folded and sewn tape 63. Attached to the bracket 77 and adjacent the

notch 81 and on the left end thereof is a hardened cutter plate 83 having a cutting notch 85.

Rotatably borne on a stud 87 is a swinging, double-acting cutter support 89 which carries a hardened blade 91 for flat cooperation with the cutter plate 83. The knife 91 is double-edged, as shown at numerals 93 and 95, so that it may cut both on a forward or backward stroke across the notch 85. A spring 97 reacts from a head 99 to force the blade 91 into close contact with the plate 83.

The cutter support 89 has oppositely extending pin joints 101 for articulation with connecting rods 103 which respectively reach the armatures 105 and 107 of solenoids 109 and 111. The solenoids 109 and 111 are enclosed in a case 131 which is attached to said bracket 77. By alternately energizing the solenoids 109 and 111, the blade 91 may be rocked across the notch 85.

In order to effect control of the energization of the solenoids 109 and 111, there is provided on the bracket 77 a smaller bracket 133 (Fig. 4) which provides a pivot at 135 for a detector bar 137. The bar is swingable in a horizontal plane on the joint 135. The detector bar is at such an elevation and so arranged with respect to the oncoming bag that it contacts the throats of the bags just below the attached tape. The bar 137 has a curved front end 138 and a notched rear end 140 serving purposes to be particularized. When the detector 137 contacts the forward edge of a bag, the throat of the bag forces the detector to the left (Fig. 4) and when it leaves the bag at the rear edge, it swings to the right. In order that the bags may be definitely formed in relation to the detector 137, there are provided parallel guides 141 providing an inlet flared region 143. These guides have the effect of providing a definite form to the throat of the bag as it approaches the detector 137 so that operation is consistent. This is accomplished by the stiffening action that the guides effect on the bag by squeezing it near the throat. The guides 141 are vertically adjustable and held in position by means of set screws 145.

Pinned at 147 to the detector bar 137 is a connecting rod 149 which reaches to a lever 151 on the switch 79. The plane of movement of the detector 137 being horizontal, and the plane of movement of the lever 151 being vertical, the connecting rod 149 is ordinarily made sufficiently resilient so as to spring the slight amount required for accommodating the relative lateral motions at its opposite ends incident to this arrangement. It is clear that ball joints, or loose connections may serve a like purpose.

In diagrammatic Fig. 6 the bar 137 and lever 151 are shown in the same plane for convenience in illustration. The lever 151 is normally returned to a clockwise position (Fig. 2) by means of a return spring 153 (Figs. 3 and 6), thus tending normally to throw the detector 137 to the right (Fig. 4) and against an on-coming bag.

Operation of the device is as follows:

The spring 153 not only sets the detector 137 toward the right (Fig. 4) but also sets the switch 79 so that the switch arm 155 thereof is set to energize the contact 157 of a line 159. The line 159 normally energizes the solenoid 111 so as to draw up in the armature 107 to the position shown in Figs. 2 and 6. This causes the knife blade 91 to be set into its normal position to the right of the notch 85 (Fig. 2).

So long as a portion of the advancing tape 63 which has no closed bag mouth therebetween, ad-

vances through the slot 85, the tape passes as is shown in Fig. 2.

However, when a bag approaches, it contacts the detector 137, so that the latter is thrown to the left, thus throwing the switch arm 155 to connect with a contact 161, thereby breaking the circuit through the connection 159 and placing in the circuit a connection 163 which energizes the other solenoid 109. The solenoid 109 being energized and the solenoid 111 being deenergized, the armature 105 of the former is drawn up. This causes a quick advance of the cutter 91 from the position shown in Fig. 2 to the position shown in Fig. 3. This, as will be apparent from Fig. 4, cuts the tape off a slight distance ahead of the bag mouth. Then as the bag continues to pass through the guides 141, the detector 137 is maintained in a position such that the parts remain as shown in Fig. 3.

When the trailing edge of the bag leaves the detector 137, the spring 153 returns the detector to its normal position, thereby again deenergizing the coil 109 and reenergizing coil 111 so as to again set the mechanism into the position shown in Fig. 2. This resetting causes the knife 91 to cut behind the bag by means of its second edge.

In Fig. 6 it will be seen that the sections 159 and 163 of the parallel circuits are fed from a main circuit 165.

It will be seen that the detector 137 has a curved front ahead of the cutter 91, as shown at 138, and a notched rear end 140 on the opposite or rear side of the cutter. The purpose of this form is to obtain proper timing of the cutter with respect to the passing bag. For instance, when a bag is approaching, the leading edge touches the curved portion 138 of detector 137 before the front edge of the bag is at the cutter 91. Thus the cutter becomes operative upon a portion of the tape which extends a short distance ahead of the front edge of the bag.

On the other hand, the flat portion 142 on the detector (between the portion 138 and the notch 140) insures that the detector will remain in a position to hold the cutter 91 in the position of Fig. 3 until the bag has passed the cutter. The distance that the bag passes is such that the tape cut is made at a distance behind the bag, preferably about equal to the distance that the forward tape cut has been made ahead of the bag. The criterion for proper operations in this respect is that the effective parts 138 and 140 of the detector 137 shall be on opposite sides of the cutter 91.

Among the advantages of the invention may be noted the fact that the knife cuts only one section of tape from between bags, thus distinguishing from apparatus which snips the tape between bags into small lengths, due to continuous automatic cutting operation on the tape between bags. The method of cutting out the tape between bags avoids the necessity for equally spacing the bags (although the bags may be spaced if desired) and whether or not they are spaced, the cut-out tape between bags is always in a single length. On certain prior apparatus the cutter oscillated only once between bags; instead of operating twice, as herein, to provide means for cutting out single tape sections between bags so as to accommodate irregular bag spacing, if and when it occurred.

The present device is quite reliable because of the minimum amount that the cutter operates (particularly under conditions of irregular bag spacing) and because of the means taken for

properly stiffening and forming the bag throat 149 so that the action on the detector 137 is definite.

The use of the electric solenoids for operating the cutter is advantageous inasmuch as it results in a very quick, snap-action for effecting the cut, and hence there is not enough time for tape to pile up behind the blades as a cutting traverse is made.

For clarity in explanation, there has been omitted from the drawings any showing of a safety cover for the cutter, but it is to be understood that one is used and fastened at 171.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In apparatus for attaching a continuous length of tape to spaced articles, comprising a cutter, means for continuously moving the tape with the joined articles past the cutter, means for moving said cutter back and forth across the path of the tape to effect a cutting action on successive strokes, and means responsive to passage of an article past a given region adapted to cause the cutter to move once in one direction ahead of a given article and once in the reverse direction therebehind, said last-named means comprising a pair of electromagnets each adapted to actuate the cutter reversely against the other electromagnet, an electric circuit, a switch adapted to alternatively energize said electromagnetic means through the circuit, and a detector responsive to passage of an article adapted to move said switch to energize one electromagnet upon approach of an article and to energize the other upon recession of said article, each electromagnet being deenergized when the other is energized.

2. In apparatus of the class described, means for attaching a continuous length of tape to successive articles which may be unevenly spaced, a double-acting cutter adapted to swing across the path of tape in two directions and to cut in both directions, electrical means for moving the cutter, an electric circuit for energizing said electric means, a switch having alternative positions and adapted to cause movement of the cutter in one direction or another by alternative energization of the circuit, and a single detector having a point on one side of the cutter engageable by the forward edges of advancing articles to move the switch whereby the cutter cuts the tape ahead of the respective article, said detector means having a portion on the other side of the cutter adapted upon leaving the trailing edge of the article to set the switch to cause return movement of the cutter so as to cut the tape behind the article.

3. In apparatus of the class described, employing means for applying continuous lengths of tape to successive bags, a double-edged cutter, means for advancing successive bags with the tape to pass the cutter, means for swinging the cutter back and forth across the tape to cut the same upon successive strokes, guide means for maintaining a portion of each bag in a predetermined shape as it passes a given region, a

detector engageable with the bags as they pass said region, means actuated by said detector adapted upon disengagement of the detector from a bag to cause cutting action on the tape behind the bag and upon engagement with the next bag to cause return movement of the cutter again to cut the tape between bags and adjacent to said next bag, successive tape cutting actions being by different edges of said cutter.

- 10 4. In apparatus of the class described employing means for applying a continuous length of material to successive articles, a plate having a notch accommodating passage of the material, a two-edged cutter cooperable with said plate at the notch and swinging across the tape to cut the same upon successive oscillations, a pair of
15 electromagnets each of which is adapted to be alternatively exclusively energized to move the cutter in one direction, a detector adapted to be contacted by the articles as they pass near the cutter, a switch operable by said detector to alternatively energize the electromagnets, depending upon whether the detector engages the
20 article or not, said detector being formed so that

said cutter cuts ahead of the bag on one oscillation and to the rear of the bag on the succeeding operation.

- 5 5. In apparatus of the class described including means for applying a continuous length of tape to successive articles, a plate having a notch accommodating passage of the tape, a two-edged cutter cooperable with said plate and swinging across the tape to cut the same upon successive oscillations, a pair of electromagnets each of which is adapted to be alternatively exclusively
10 energized to move the cutter in one direction, a detector adapted to be contacted by the articles as they pass near the cutter, a switch operable by said detector to alternatively energize the electromagnets, depending upon whether the de-
15 tector engages the article or not, said detector being formed so that said cutter cuts ahead of the bag on one oscillation and to the rear of the bag on the succeeding operation, and guide means
20 adapted to engage the bags to stiffen and hold them in substantially predetermined forms as they are contacted by the detector.

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