

March 17, 1942.

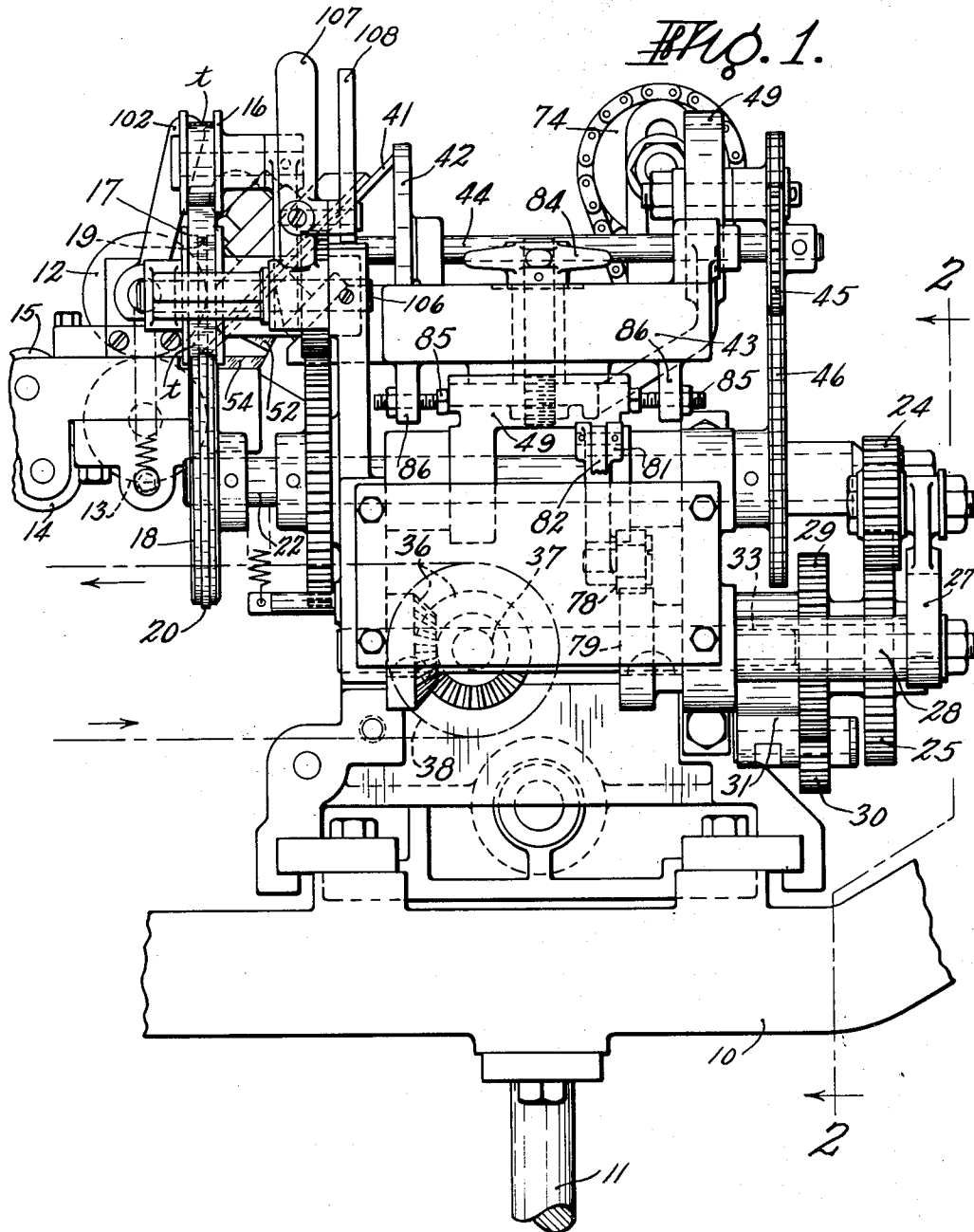
E. L. SMITH

2,276,745

TEARING STRIP APPLYING DEVICE

Filed March 6, 1941

5 Sheets-Sheet 1



INVENTOR
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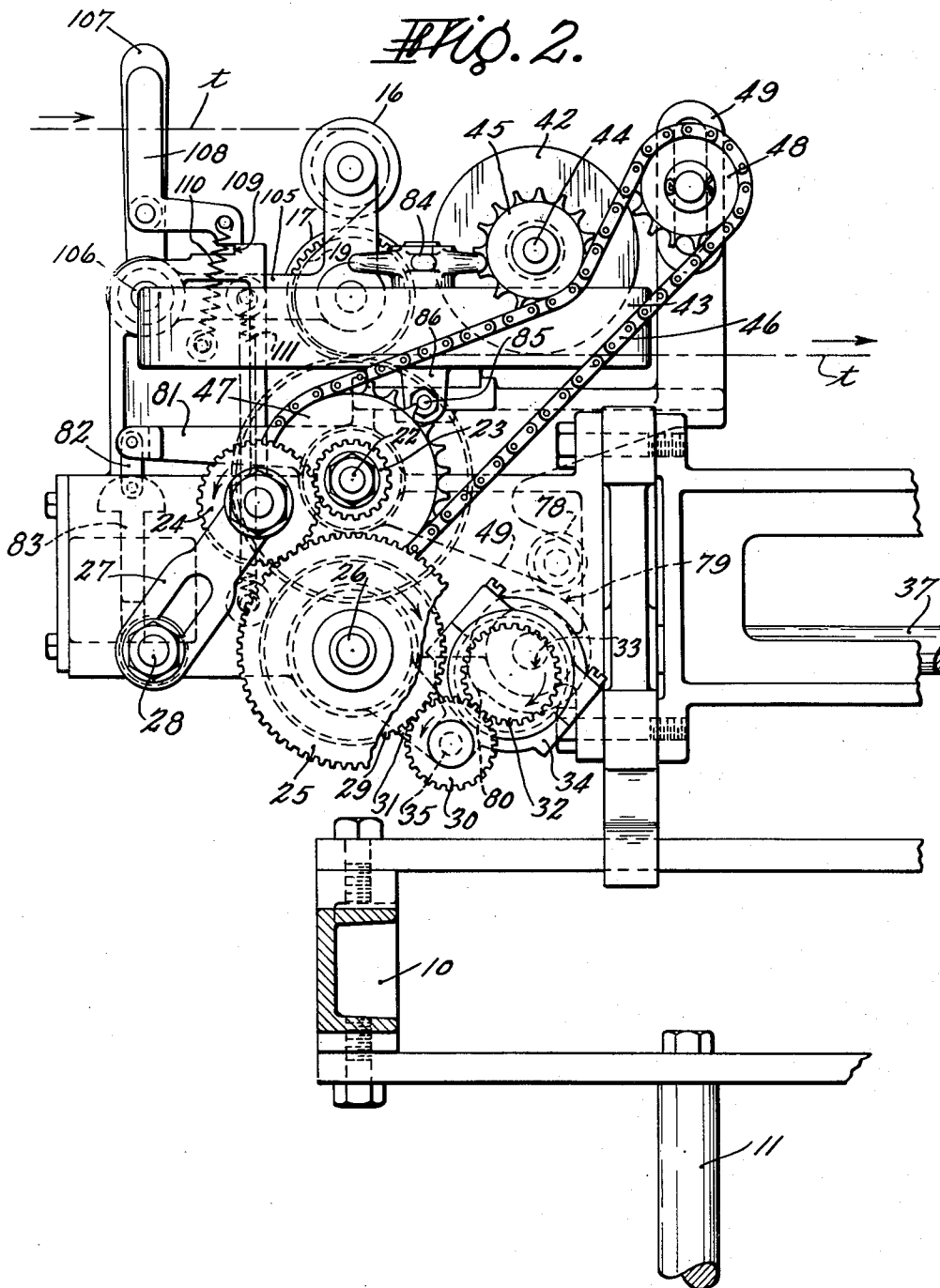
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5 Sheets-Sheet 2



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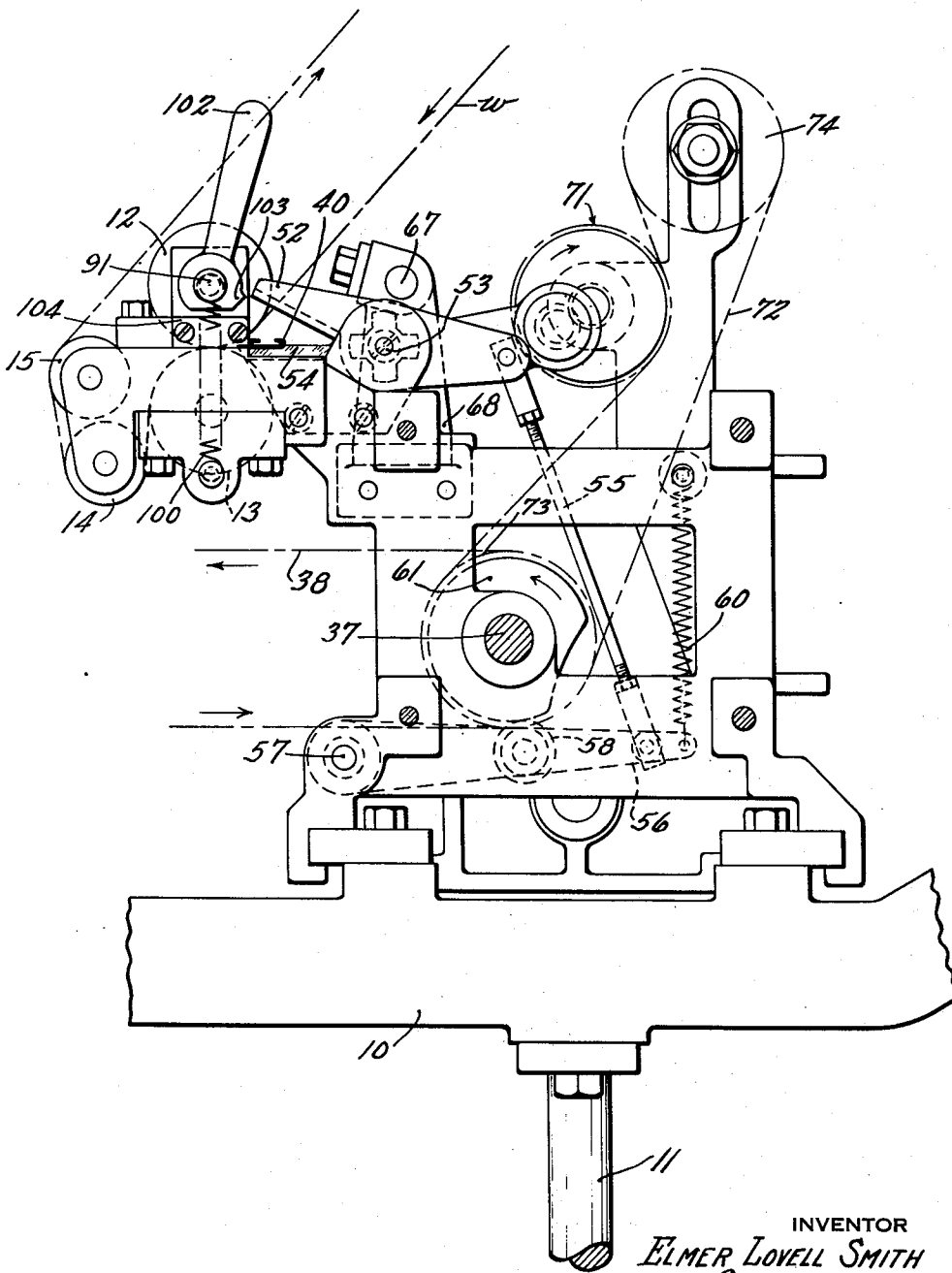
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Fig. 3.



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Fig. 4.

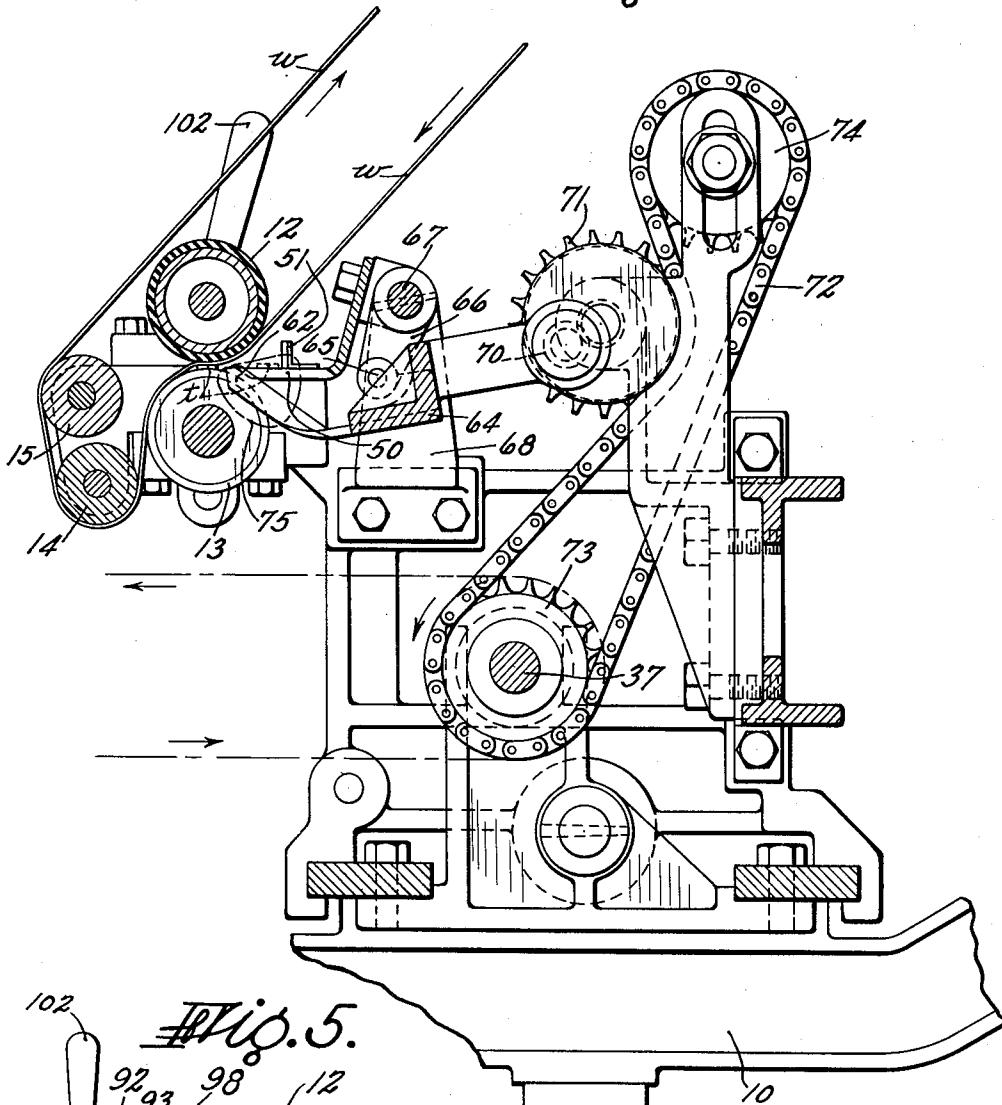
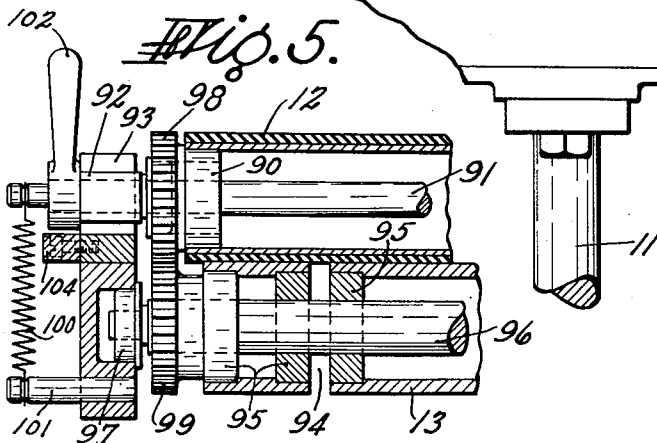


Fig. 5.



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Fig. 6.

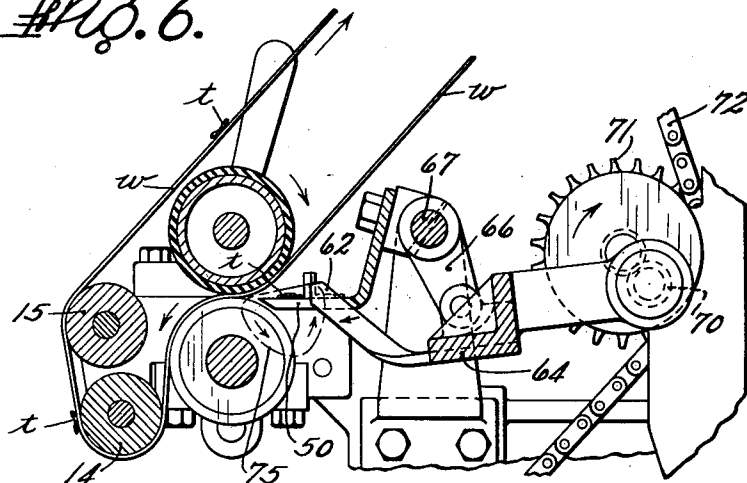


Fig. 7.

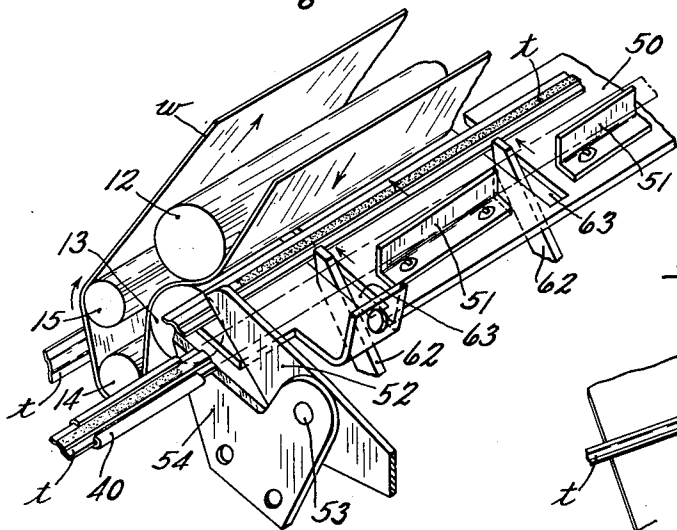
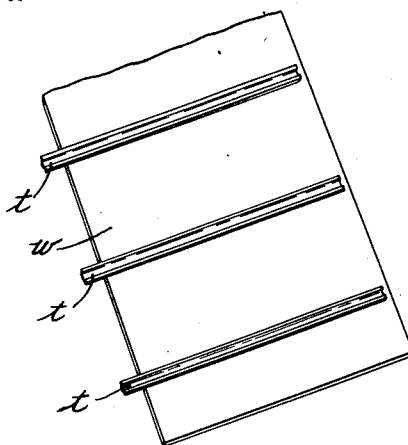


Fig. 8.



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UNITED STATES PATENT OFFICE

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TEARING STRIP APPLYING DEVICE

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Application March 6, 1941, Serial No. 382,022

7 Claims. (Cl. 93—1)

This invention relates to improvements in mechanism for locating upon and affixing to a wrapper in web form a succession of tearing strips extending transversely of the web. In the usual type of wrapping machine the tearing tape is placed upon the wrapper web in a longitudinal line. Such an apparatus is shown in the Melhorn Patent 1,965,524. With other types of wrapping machine, however, the tearing strip must be positioned transversely of the web; and as far as I am aware there have been up to the present time no mechanisms available for securing the tape to a web in this manner. It is the object of the invention to measure out and affix a succession of tapes transversely of the web, and to do this while the web itself is moving forward either continuously or intermittently. It is a further object to provide a mechanism of this character in which the tape feed can be adjusted readily to accommodate different widths of webs. It is a further object to provide a tape applying mechanism capable of being attached as a unit to existing wrapping machines. Additional objects will appear from the following description and claims.

Referring to the drawings:

Fig. 1 is an elevation of the tape feeding mechanism;

Fig. 2 is a side elevation of this mechanism, taken on line 2—2 of Fig. 1;

Fig. 3 is a section therethrough showing the tape severing mechanism;

Fig. 4 is a section therethrough showing the mechanism for delivering the severed tape to the web;

Fig. 5 is a sectional detail of the web feed rolls;

Fig. 6 is a detail corresponding to a part of Fig. 4 but showing the parts in a different position;

Fig. 7 is a perspective detail of the tape severing mechanism and the mechanism for affixing the severed tape to the web; and

Fig. 8 is a detail of a length of web with a plurality of spaced tapes affixed to it.

The tape feeding attachment is carried by a frame 10, which may if desired be a continuation of that of the wrapping machine and may be supported as by posts 11. The wrapper web *w* comes from any desired source on the wrapping machine, and passes between rolls 12 and 13, constructed as will be described below, and then over guide rolls 14 and 15. The web feed is preferably controlled from the wrapping machine, being either continuous or intermittent depending upon the type of mechanism with which it is associated. The rolls 12, 13, 14, and 15 need not be

driven, since the web is pulled through them by the main web feeding devices. The tape *t* comes from any convenient source (Fig. 2) and passes around a flanged guide roll 16 and then between a pair of intermittently driven rolls 17 and 18. Roll 17 is flanged, and has a central depression 19; while roll 18 fits between the flanges of roll 17 and has a central rib 20 entering the depression 19. The combined action of these rolls is to give to the tape a corrugation which substantially increases the rigidity of the tape as it is fed out horizontally beyond the rolls (cf. Figs. 1, 2, and 7).

Roll 18 is fast on a shaft 22 coupled through change gears 23, 24, and 25 with a shaft 26 which is intermittently driven in timed relation to the wrapping machine in a manner which will now be described. The intermediate gear 24 is carried by a slotted arm 27 mounted on a post 28 as is customary with change gears; and the latter may be changed to vary the amount of tape fed out during each cycle of the machine. Upon shaft 26 is a second gear 29, in mesh with which an intermediate gear 30 is held by an arm 31 pivoted upon the shaft. A gear 32 is eccentrically mounted on a drive shaft 33, and the intermediate gear is held in mesh with it by an eccentric strap 34 pivoted to the arm 31 at 35. This mechanism is what is known as a wobble gear drive; and, as described in the Smith Patent 2,210,734, August 6, 1940, will produce intermittent motion of shaft 26 from a continuous rotation of shaft 33. Shaft 33 has bevel gear connection 36 (Fig. 1) with a shaft 37 coupled by sprocket and chain 38 with a suitable drive sprocket on the wrapping machine.

The tape projected from between the rolls 17 and 18 passes along a guide 40 (Figs. 3 and 7) and underneath a conical glue wheel 41 (Fig. 1) running in contact with the face of a transfer roll 42 dipping into a glue pot 43. Roll 42 is mounted on a shaft 44 having at its end a sprocket 45 given an intermittent motion synchronous with the movement of the tape by a chain 46 passing around a sprocket 47 on the shaft 22 and around an idle sprocket 48 adjustable for tightening purposes on a bracket 49 which carries the glue pot and is pivoted on shaft 22 for a purpose to be described. The conical wheel 41 may be driven in any desired way, as by contact with the roll 42.

From the wheel 41 the glued tape passes (Figs. 4, 6, and 7) onto a shelf 50 positioned in front of the bite of the web feeding rolls 12 and 13. Slanting guides 51 on this shelf insure the correct positioning of the tape. As the tape comes to rest upon the shelf a length is severed from its leading

end by a movable shear blade 52 pivoted at 53 to the lower blade 54 and actuated by a link 55 (Fig. 3) extending to a lever 56 pivoted to the frame at 57 and having a cam roll 58 held by a spring 60 against a cam 61 on shaft 37.

The severed tape lies in front of a plurality of fingers 62 movable in slots 63 in the shelf and carried by a swinging member 64. The member is pivoted at 65 to links 66 swinging at 67 from the shelf supporting brackets 68, and is connected to a pin 70 eccentrically mounted on a shaft carrying a sprocket 71. This sprocket engages a chain 72 passing over a sprocket 73 on shaft 37 and around an idle adjusting sprocket 74. By the continued rotation of the sprocket the ends of the fingers will be moved through a path shown at 75 in Figs. 4 and 6, pushing the tape laterally into the bite of rolls 12 and 13 (Fig. 7) and then returning to its rearward position in a lowered position underneath the next length of tape being advanced. The tape thus shifted by the fingers passes with the web between the rolls and is stuck to it by reason of the adhesive coating it had previously received. As successive lengths of tape are fed out, severed, and pushed into contact with the wrapper, these lengths will be stuck to the web in spaced relation as shown in Fig. 8.

As shown in the latter figure the shears are so positioned as to leave a portion of the tape overhanging the edge of the sheet to serve later as a pull tab. It is desirable that this projecting end should not be coated with adhesive, and provision is therefore made for raising the wheel 41 from the tape at periodic intervals. As previously stated, the glue pot is mounted on a bracket 49 pivoted upon the shaft 22, the wheel 41 being carried on the glue pot. A cam roll 78 on the bracket rests upon a cam 79 mounted on the shaft 33, the cam having a local raised portion 80 of sufficient circumferential extent to raise the glue wheel off the tape the desired distance before the latter is brought to rest for severance.

It is in many cases desirable to cause the glue wheel to be elevated off the tape whenever the machine is stopped. To this end the bracket is fitted with a projecting arm 81 joined by a link 82 with the armature 83 of a solenoid which may be connected in any desired way in the main driving circuit, so that the glue wheel will be raised whenever the motor is stopped. In order to permit adjustment of the glue wheel laterally of the tape the glue pot, which it will be recalled carries the wheel, is held to the bracket 49 by a clamp screw 84. When this screw is loosened the glue pot can be adjusted by screws 85 (Fig. 1) threaded into lugs 86 on the glue pot and engaging the sides of the bracket.

The various feed rolls are designed for manual separation to facilitate threading of the web or tape between them. The structure of the web feeding rolls 12 and 13 is best shown in Figs. 3, 4, and 5. Upper roll 12 is carried on collars 90 mounted on a shaft 91, which at its ends is journaled in boxes 92 vertically movable in guide-ways 93. Lower roll 13 is made in spaced segments, the gap 94 between which permit the passage of the tape positioning fingers 62. The segments are mounted on collars 95 on a shaft 96 received in bearing members 97 on the frame. A gear 98 on shaft 91 and a gear 99 on shaft 96 connect the two rolls for simultaneous movement. Normally the rolls are held in contact by springs 100 connecting the end of shaft 91 with a pin

101 on the frame, but when desired they may be separated by a handle 102 on the end of the shaft and carrying a cam portion 103 adapted to engage a bearing plate 104 on the frame to elevate the shaft and retain it temporarily in elevated position.

Rolls 16 and 17 are carried on end frames 105 pivoted to the frame 10 at 106 and provided with an upstanding handle 107. To hold the frame in the raised position to which it may be moved by this means a bell crank 108 is pivoted on the handle 107, having one end serving as a latch handle and the other as a detent adapted to be drawn into engagement with an abutment 109 by a spring 110. The frames 105 are drawn in a direction to hold roll 17 in contact with roll 16 by a tension spring 111.

What I claim is:

1. A machine for applying tearing strips across a wrapper web which comprises a pair of web feed rolls, a shelf adjacent the bite of the rolls, means for placing an adhesive tearing strip on the shelf, and a pusher operable in timed relation to the web to engage one lateral edge of the tearing strip to shift it laterally from the shelf into the bite of the rolls.

2. A machine for applying tearing strips across a wrapper web which comprises a pair of web feed rolls, a shelf adjacent the bite of the rolls, means for placing a long narrow adhesive tearing strip on the shelf parallel to the axis of the rolls, and a pusher operable in timed relation to the web and movable bodily in an endless path with its return portion below the shelf to shift the tearing strip laterally from the shelf into the bite of the rolls.

3. A machine for applying tearing strips to a web which comprises a pair of web feed rolls, a pair of tape feed rolls at right angles thereto, means for rotating the tape feed rolls in timed relation to the web feed rolls to project a tape into adjacency with the bite of the web feed rolls, means to sever the projected tape, and a device having a movement of translation towards the rolls to deliver a severed tape into the bite of the web feed rolls.

4. A machine for applying tearing strips to a web which comprises a pair of web feed rolls, a pair of tape feed rolls at right angles thereto, means for rotating the tape feed rolls in timed relation to the web feed rolls to project a tape into adjacency with the bite of the web feed rolls, adhesive applying devices acting on the tape being so projected, means to sever the projected tape, and a device having a motion of translation towards the web feed rolls to deliver a severed adhesive tape into the bite of the rolls.

5. A machine for applying tearing strips to a web which comprises a pair of web feed rolls, a pair of tape feed rolls at right angles thereto, means for rotating the tape feed rolls in timed relation to the web feed rolls to project a tape into adjacency with the bite of the web feed rolls, adhesive applying devices intermittently acting on the tape being so projected to leave a short uncoated portion in each length fed out, means to sever the projected tape at the end of said uncoated portion with said portion overhanging the lateral edge of the web, and a device having a motion of translation towards the web feed rolls to deliver a severed adhesive tape into the bite of said rolls with said uncoated portion projecting from the side of the web.

6. A machine for applying tearing strips to a web which comprises a pair of web feed rolls, a

pair of tape feed rolls at right angles thereto, means for rotating the tape feed rolls in timed relation to the web feed rolls to project a tape into adjacency with the bite of the web feed rolls, an adhesive applying wheel positioned to apply adhesive to said tape, means for supplying adhesive to said wheel, means for causing the wheel to contact the tape intermittently to leave a short uncoated portion in each length fed out, means to sever the projected tape at the end of said uncoated portion with said portion overhanging the lateral edge of the web, and a device having a motion of translation towards the web feed rolls to deliver a severed adhesive tape into the bite of said rolls with said uncoated portion projecting from the side of the web.

7. A machine for applying tearing strips to a web which comprises a pair of web feed rolls, a pair of tape feed rolls at right angles thereto,

means for rotating the tape feed rolls in timed relation to the web feed rolls to project a tape into adjacency with the bite of the web feed rolls, an adhesive applying wheel positioned to apply adhesive to said tape, means for supplying adhesive to said wheel, means for causing the wheel to contact the tape intermittently to leave a short uncoated portion in each length fed out, solenoid controlled means for shifting the wheel out of contact with the tape upon stoppage of the machine, means to sever the projected tape at the end of said uncoated portion with said portion overhanging the lateral edge of the web, and a device having a motion of translation towards the web feed rolls to deliver a severed adhesive tape into the bite of said rolls with said uncoated portion projecting from the side of the web.

ELMER LOVELL SMITH.