E. H. ANGIER AND W. M. WHEILDON.

PACKAGING MECHANISM.

APPLICATION FILED NOV. 30, 1917.

1,362,382.

Patented Dec. 14, 1920.

4 SHEETS—SHEET 1.

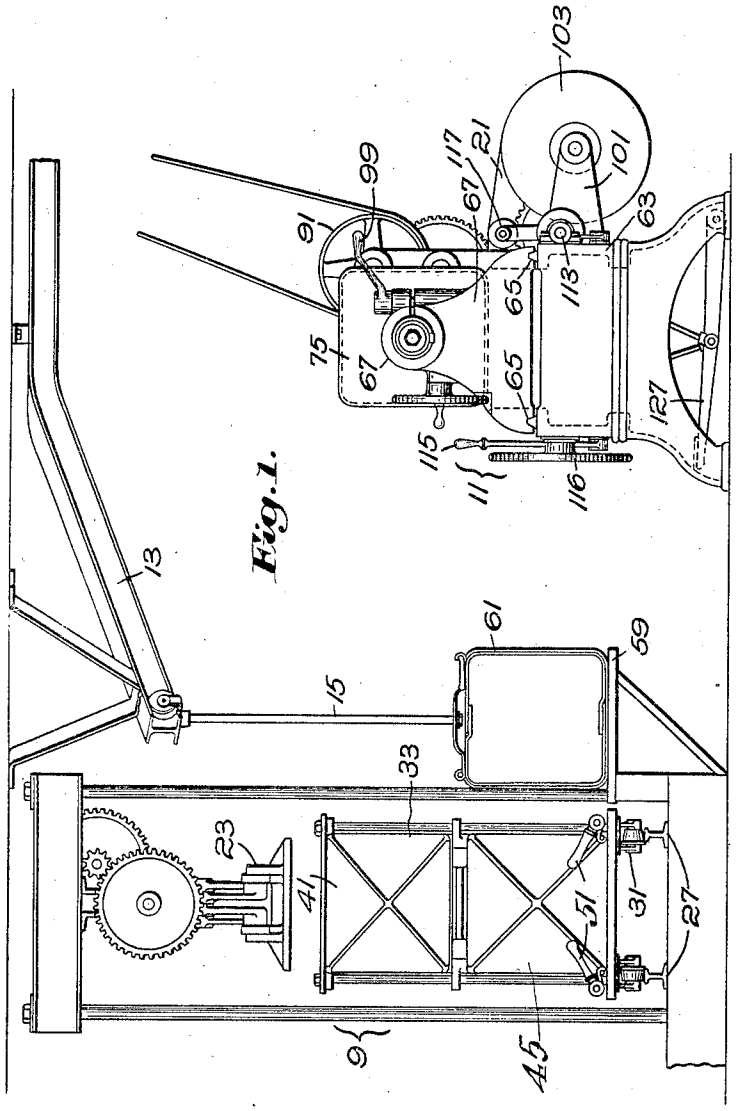


Fig. 1.

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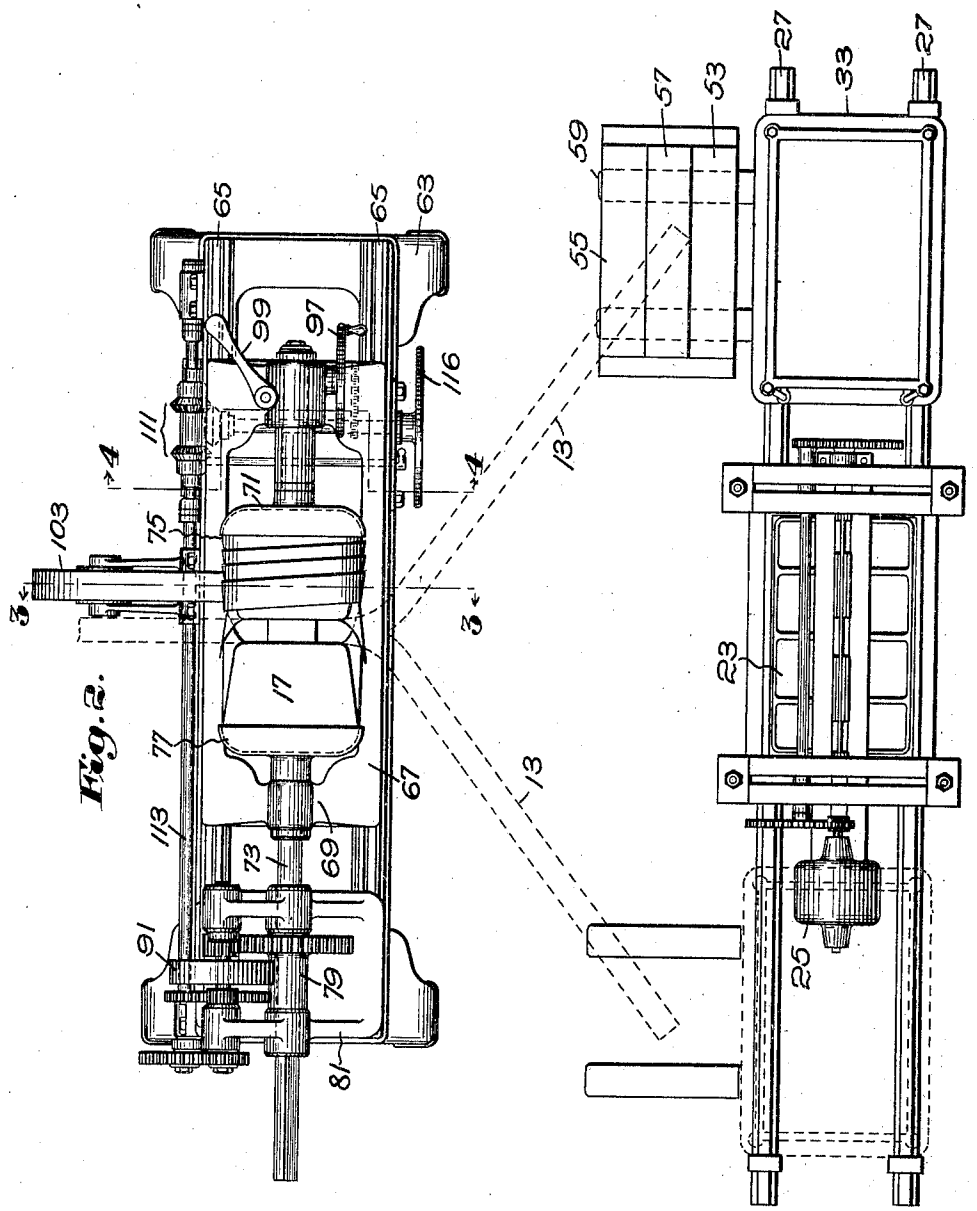


Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 4.

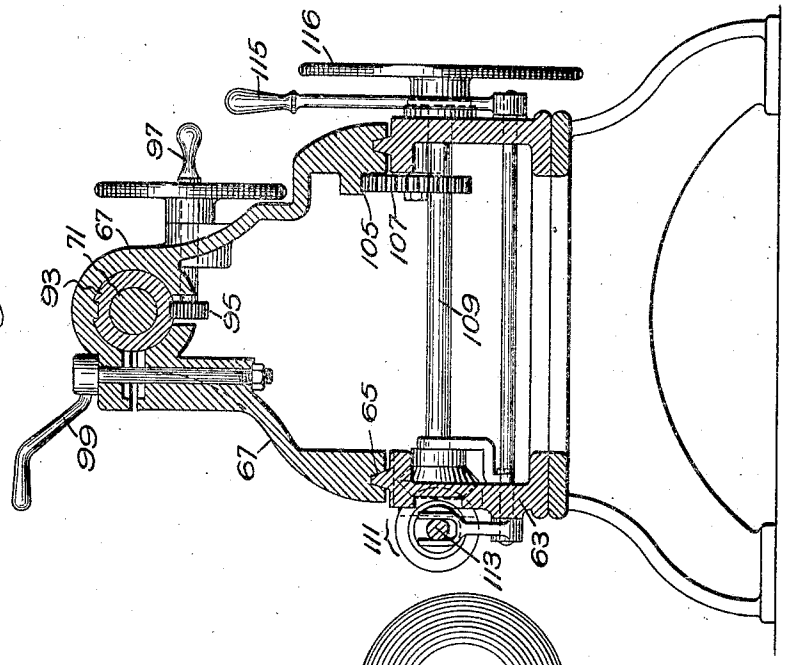
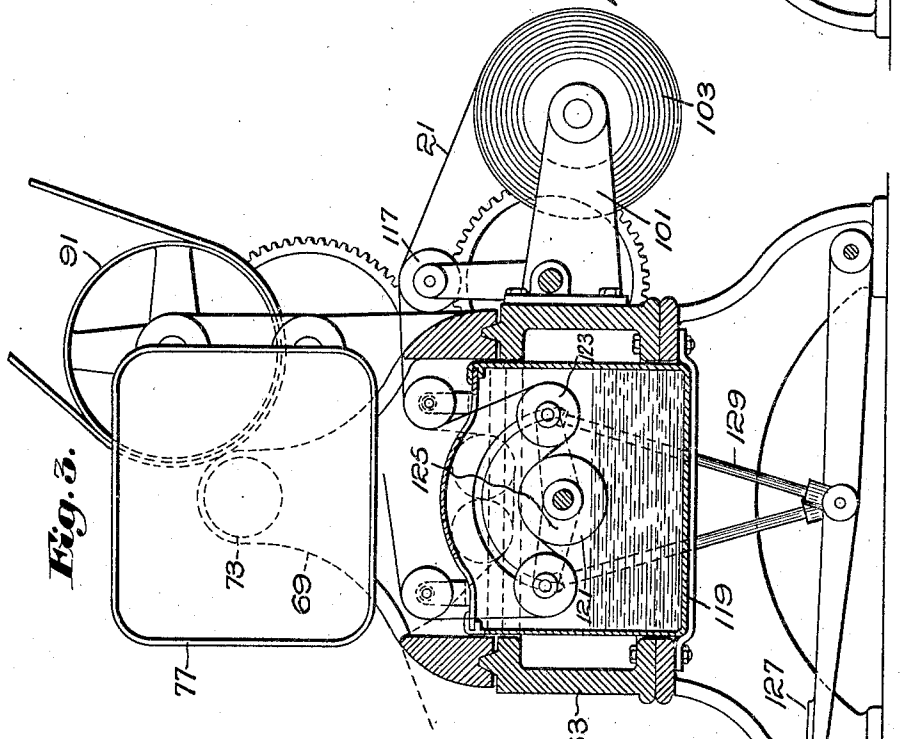


Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 2.

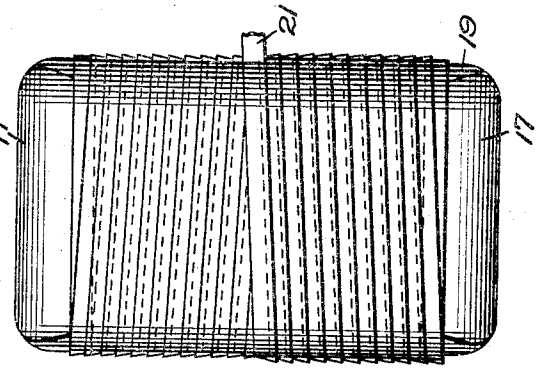


Fig. 6.

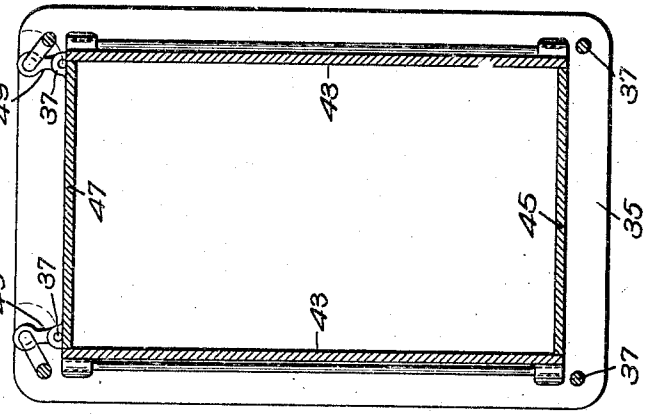
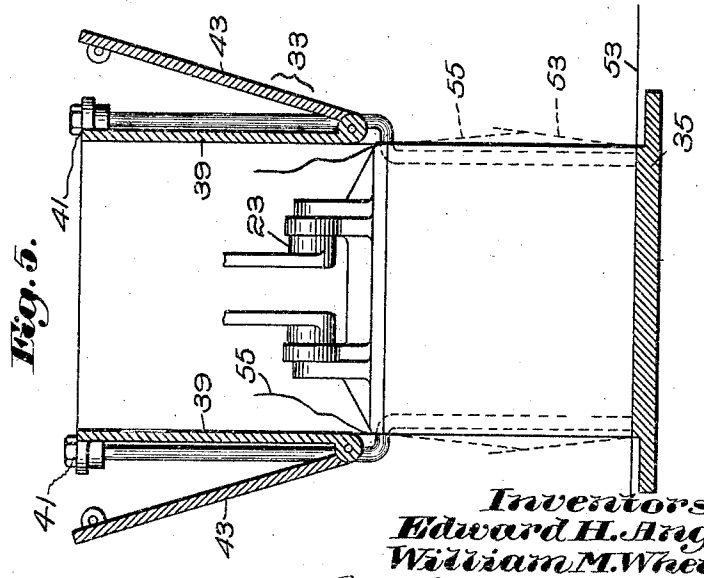


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD H. ANGIER, OF FRAMINGHAM, AND WILLIAM M. WHEILDON, OF ASHLAND, MASSACHUSETTS; SAID WHEILDON ASSIGNOR TO SAID ANGIER.

PACKAGING MECHANISM.

1,362,382. Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed November 30, 1917. Serial No. 204,495.

To all whom it may concern:

Be it known that we, EDWARD H. ANGIER and WILLIAM M. WHEILDON, citizens of the United States, and residents of Framingham and Ashland, respectively, county of Middlesex, State of Massachusetts, have invented an Improvement in Packaging Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to packaging mechanism and the particular purpose is to provide machinery for forming goods into packages in the nature of bales which are inclosed by a resistant wrapping conforming thereto.

Our invention will best be understood by reference to the following description of an illustrative embodiment thereof taken in connection with the accompanying drawings wherein:

Figure 1 is a side elevation of mechanism involving our invention;

Fig. 2 is a plan view thereof;

Figs. 3 and 4 are sections on the lines 3—3 and 4—4 of Fig. 2, respectively;

Fig. 5 is a vertical section through one of the baling forms;

Fig. 6 is a horizontal section of the same; and

Fig. 7 is an elevation of the package as it would appear when partially completed.

The mechanism as herein disclosed involves two principal component parts which, as they are in a way separate units, would in ordinary parlance be referred to as separate machines but which, however, are so cooperatively related that they, in fact, philosophically considered, form a single machine. To avoid confusion, however, we have herein referred to the entire installation as a mechanism and may hereafter refer to either of the component parts as a machine, since that will accord more nearly with ordinary nomenclature.

Referring to Fig. 1, our mechanism may be briefly described as comprising suitable baling or press mechanism denoted generally by the numeral 9, a wrapping mechanism 11 to apply wrapping to the bale material, and transfer means herein exemplified by overhead tracks 13 and a trolley 15.

The description of these devices may be somewhat facilitated by a brief description of the package formed thereby. Referring to Fig. 7, the package takes the form of a bale of the usual substantially parallelepipedal form. Over the ends of the bale are placed sheets 17, preferably of a reinforced waterproof paper, which may be fitted over the ends by means of boxplaits 19 at the edges of the bale. Inclosing the middle portion of the bale and binding down the ends of the sheets 17 is a wrapping formed of a narrow strip 21, preferably of reinforced paper, which encircles the bale in overlapping helical convolutions which may extend back and forth from end to end of the bale to provide superposed layers of alternately opposite pitch. Preferably as the strip is applied it is treated with a suitable adhesive, such as bitumen, which desirably has certain waterproof qualities and which seals all the turns of the strip together to make a unitary inclosing shell about the package. In Fig. 7 the package is not completed, one of the wrappings with the strip 21 being shown as about half finished in order to expose the layer beneath.

Referring now to Figs. 1 and 2, one of the component machines of our mechanism provides means for bringing the material to be packaged into the form of a bale. This mechanism is the one designated generally by the numeral 9. For this purpose we provide a baling press of any suitable form having a plunger 23 which may be actuated by the electric motor 25 (Fig. 2). Extending beneath the plunger 23 we show tracks 27 on which are adapted to run trucks 31 on which are mounted forms or containers 33 for the material to be baled. The tracks 27, as seen in Fig. 2, extend to either side of the plunger head 23 and the forms can be drawn to either side from beneath the plunger or run in to permit the latter to work upon the material inclosed in the form. Preferably two such forms are provided so that one, such as that shown at the right in Fig. 2, is accessible for removal of the baled material or to permit packing of new material therein while the other is beneath the plunger 23 and the material therein is either being compressed or held in a compressed condition. When the pressure on the plunger is released, the form beneath the same can be drawn to the dotted line position in Fig. 2 and the form which is at the right in that figure and which has been filled with

fresh material is run in to the left beneath the plunger head.

The forms 33 are preferably constructed as shown in Figs. 5 and 6 to which we will next refer. As there shown, from the floor 35 of each truck extend uprights 37 on which are mounted sides 39 extending from the upper ends 41 of the uprights to about the middle portion thereof. To the sides 31 are hinged movable side portions 43 extending from the middle portion of the uprights to the floor 35 of the truck when in their closed position as shown in Fig. 6 and which may be swung upwardly as shown in Fig. 5. Lower end portions 45 and 47 are provided, one of these end portions, as 47, preferably being mounted on the uprights by a parallel linkage 49 permitting the same to be swung clear from the end of the baled material. As seen in Fig. 1, latches 51 may be provided to hold the sides 43 in depressed position and the end 47 in the position shown in Fig. 6.

We will next describe the operation of the device, supposing the parts to be in the position shown in Fig. 2, the description, however, having reference more particularly to Fig. 5. A sheet of paper 53 of the length of the container and considerably wider is preferably spread over the bottom of the right hand container 33 and the same is then filled with the material to be baled. A second sheet of paper 55 is then placed in position over the top of the container, and it is run in to the right underneath the plunger head 23, displacing its companion to the dotted line position shown in Fig. 2. The motor may then be started, lowering the head 23 and compressing the material in the form as indicated in Fig. 5. The limit of compression is somewhat below the tops of the lower sections 43 and 47 of the container walls. The upper sheet of paper 55 will of course take the full line position shown in Fig. 5. The latches 51 are then released and the sides 43 lifted, which permits the sheet 53 to be folded upwardly and the sheet 55 downwardly to the dotted line position in Fig. 5 where they may be joined by means of a strip or band 57 (Fig. 2) of gummed paper or the like drawn from a convenient container.

The material so baled and inclosed by the joined sheets 53 and 55 is left beneath the plunger 23 while the other container is being packed. During this time the adhesive on the bands 57 will have time to set so that when the newly packed container is ready to be run into place beneath the plunger, the first may be withdrawn and the bale rolled out from the same onto the supports 59, and the encircling sheets 53 and 55 joined by the bands 57 will hold the same in shape. The movable mounting of the end piece 47, as described, facilitates the withdrawal of the bale from the form.

The partly finished bale on the supports 59 may be surrounded by strap 61 carried by the trolley 15 and transported to the wrapping mechanism 11 which we shall next describe. While the bale is on the transfer mechanism and before it is delivered to the wrapping mechanism, the end papers 17 shown in Fig. 7 may be fitted thereto. Conveniently such end papers may be folded beforehand into cup-like form ready to be slipped over the ends of the bale.

As seen in Fig. 2, the particular form of wrapping machine 11 herein disclosed embodies a bed 63 having parallel guideways or tracks 65 along which is adapted to move a carriage 67 having at either end thereof puppet heads 69 in which are journaled spindles 71 and 73 which carry on their inner ends cup-shaped chucks 75 and 77 respectively, adapted to receive and fit over the ends of the bale. The spindle 73 is a live spindle and has sliding movement in a rotatable sleeve 79 forming a part of a head stock 81 similar to the head stock of an engine lathe and which may take motion from the driving pulley 91. The gearing shown in a general way in the figures is not described in detail herein, as it may be like the gearing of lathes. The spindle 71 is a dead spindle and, as seen in Fig. 4, is journaled in a sleeve 93 splined in the puppet head 69. To advance and retract this spindle in order to adjust the chucks to the end of the bale, the sleeve may have a rack formed thereon with which meshes a pinion 95 which may be rotated by means of the hand wheel 97. A clamp 99 is provided for locking the dead spindle in adjusted position.

Mounted upon the side of the frame 63 in brackets 101 is a roll 103 of wrapping strip 21 which, as already explained and as clearly illustrated in Fig. 7, forms the main inclosure for the bale. In the present embodiment of the invention the rotation of the spindle 73 and the consequent rotation of the bale provides for drawing this strip from the roll and wrapping it about the bale and the pitch of the helical wrapping is provided for by a longitudinal feed of the carriage 67, this feed being permitted by the splined connection of the live spindle 73 with the head stock 81. Referring to Fig. 4, in the present embodiment of the invention the carriage 67 is provided with a rack 105 driven by gearing 107 from a shaft 109. The shaft 109 is driven by clutch mechanism 111 having forward, reverse and neutral positions, and takes motion (see Fig. 2) from a countershaft 113 driven by gearing from the shaft of the pulley 91. The clutch mechanism is controlled by the operator through a handle 115. A hand wheel 116 is also pro-

vided on shaft 109 so that the carriage may be shifted by hand when desired.

As seen in Fig. 3, the wrapping strip 21 is led from the roll 103 across the bed of the machine over guide rolls 117 and the end may project, as shown in dotted lines, in a position convenient to be grasped by the operator and applied to the bale in the manner shown in full lines. To apply the adhesive and waterproof material to the strip, a tank 119 may be provided therefor between the sides of the bed 63. In the tank is a coating roll 121 which revolves in the liquid therein. The strip 21 is led over rolls 123 mounted on swinging arms 125 pivoted at the center of roll 121 and which normally assume the dotted line position of Fig. 3. By means of the treadle 127 and the rods 129 which extend therefrom to the links 125, the rolls may be drawn downwardly to the full line position of Fig. 3, thus bringing the strip into contact with the coating roll 121 so that the same will be smeared or daubed with adhesive before it passes to the bale.

We will next describe the wrapping operation in order to coördinate the descriptions of the mechanism already given. Referring to Fig. 1, the bale, suspended by the trolley 15, is moved along track 13, a branch of which, as shown in Fig. 2, runs from each set of supports 59. The bale is thus brought in position over the carriage 67 between the two chucks 75 and 77 and may be swung into position against chuck 77, and the chuck 75 may be set up against the other end thereof by means of the hand wheel 97 (see Fig. 4) after which the chuck is clamped in position by the clamp 99. The strap 61 may now be removed and the trolley 15 run out of the way along the other branch of track 13 in readiness to receive a bale from the other container. The end of the strip 21 which projects as shown in Fig. 3 is picked up by the operator and given a turn around the bale and is held momentarily in place. The treadle 127 may then be depressed to the position shown in Fig. 3, drawing the rolls 123 down and forcing the strip tightly over coating roll 121 whose lower portion is traveling in the bath of waterproof adhesive.

The wrapping machine is now started, causing the spindle to rotate and consequently the bale suspended between the two chucks will be rotated and paper will be drawn from the roll 103 and wrapped about the bale. Preferably a few preliminary turns are given firmly to bind down the end paper 17 and then by means of the handle 115 the feed is thrown in, which will cause the carriage 67 to be given a movement of translation with respect to the roll, thus providing a helical pitch to the turns of the strip drawn from the roll 103 by the rotation of the bale. In Fig. 2 a few of the first of these turns are shown.

Preferably when the wrapping has proceeded to a point adjacent the farther end of the bale, the feed is stopped and superposed turns are taken. The direction of feed may then be reversed to apply a second layer of turns as shown in Fig. 7. Obviously the variations are practically infinite, since the controlling lever 115 for the feed has right, left and intermediate positions and since the gearing on the head stock 81 may be of any desired variety. The number of possible variations is as great as in the case of the well known screw cutting lathe.

The tortuous course of the strip 21 as illustrated in Fig. 3 provides for an ample tension thereon so that it is drawn smoothly and tightly about the bale.

It will be noted that the sheets of paper 53 and 55 not only act in the manner of a bale tie and hold the material compressed while it is being transferred to the wrapping machine but they protect the material from being in any way soiled by the adhesive which is applied to the wrapping strip 21. Their use, therefore, is important not only in connection with the baling mechanism 9 but also in connection with the wrapping mechanism 11 and this emphasizes the coöperative relation between these two apparently independent machines.

In operating the machine, one of the forms or containers 33 is being filled while the other is held under compression beneath the plunger 23. Thus no time is wasted while the adhesive on the strips 57 is setting. Pressure is then released, the newly filled container run under the plunger head and the partly finished bale released from the form which is then refilled. The transfer mechanism exemplified by the trolley 15 delivers the bale along the proper branch of the overhead track 13 to the chucks of the wrapping mechanism where a smooth and tight fitting wrapping is applied to complete the package. Preferably as herein disclosed the wrapping strip is treated with a waterproof adhesive so that all the parts are conglutinated into a unitary whole providing a shell-like covering formed directly upon the material which it incloses. If, for example, as herein suggested, asphalt or bitumen is used, when the material dries or sets, as it very quickly will, it will form a hide or skin of a rubbery or leathery consistency substantially without interstices and which not only will be resistant to physical shocks but will be practically weatherproof.

What we do claim and desire to secure by Letters Patent is—

1. A wrapping mechanism comprising a carriage having chucks to receive the ends of a bale, means to traverse the carriage,

means to rotate a chuck and a strip supply means adjacent the carriage.

2. A wrapping mechanism comprising puppet heads having chucks to receive the ends of a bale, means to rotate a chuck, a strip supply means adjacent the puppet heads and means to effect relative translation of the rotating chuck and the strip supply.

3. A wrapping mechanism comprising a bed having a carriage movable therealong, puppet heads on said carriage, chucks having spindles journaled in said heads, a head stock slidably receiving a spindle and having associated therewith means to rotate the same, feeding means for said carriage and a strip supply mounted beside the bed.

4. A wrapping mechanism comprising a bed having a carriage movable therealong, puppet heads on said carriage, chucks having spindles journaled in said heads, a head stock slidably receiving a spindle and having associated therewith means to rotate the same, feeding means for said carriage, a strip supply mounted beside the bed and means to apply liquid to the strip as drawn from said supply to an article in the chucks.

5. A wrapping mechanism comprising a carriage having chucks to receive the ends of a bale, means to traverse the carriage, means to rotate a chuck, a strip supply mounted beside the bed and means to apply liquid to the strip as drawn from said supply to an article in said chucks.

6. A wrapping mechanism comprising puppet heads having chucks to receive the ends of a bale, means to rotate a chuck, a strip supply means adjacent the puppet heads, means to apply liquid to the strip as drawn from said supply to an article in the chucks, and means to effect relative translation of the rotating chuck and the strip supply.

In testimony whereof we have signed our names to this specification.

EDWARD H. ANGIER.
WILLIAM M. WHEILDON.