June 13, 1933. E. L. SMITH 1,913,642

COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

Filed July 16, 1932 5 Sheets-Sheet 1

Fig. 1.

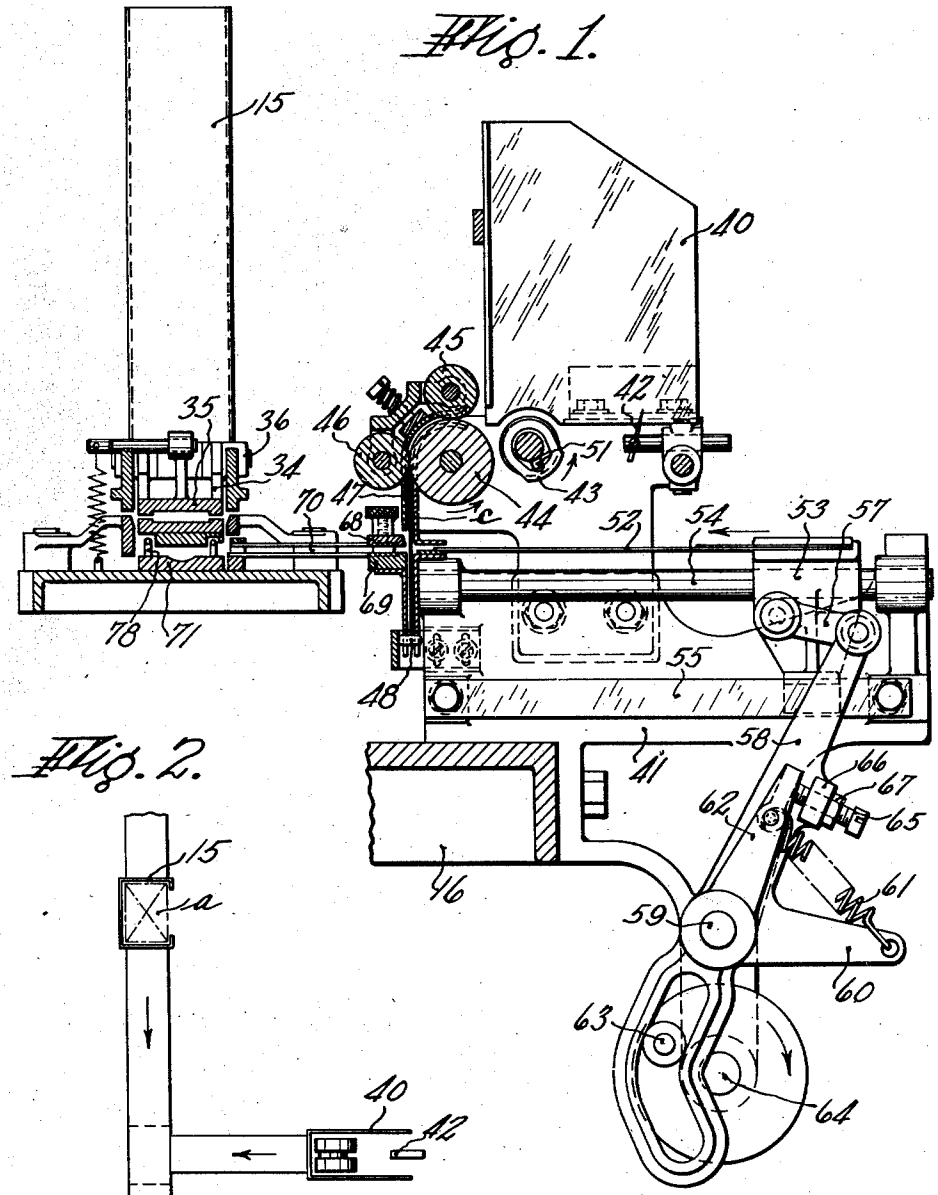
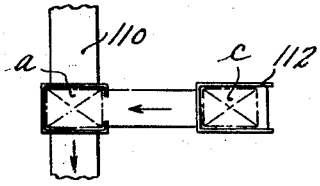


Fig. 2.

Fig. 15.



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COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

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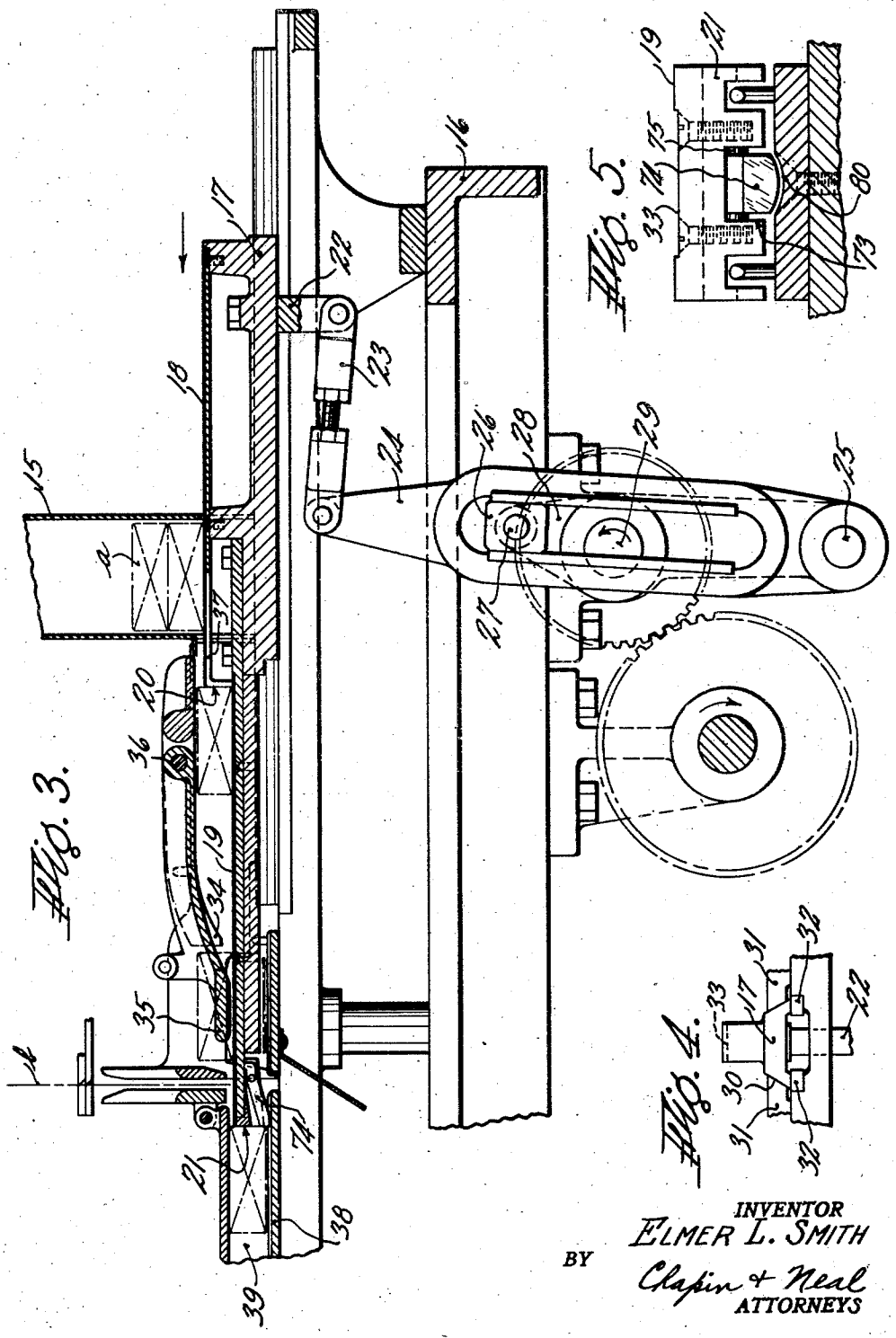

Fig. 3.

Fig. 5.

Fig. 4.

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COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

Filed July 16, 1932 5 Sheets-Sheet 3

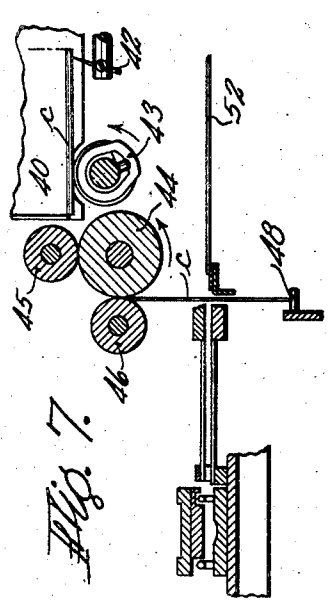

Fig. 7.

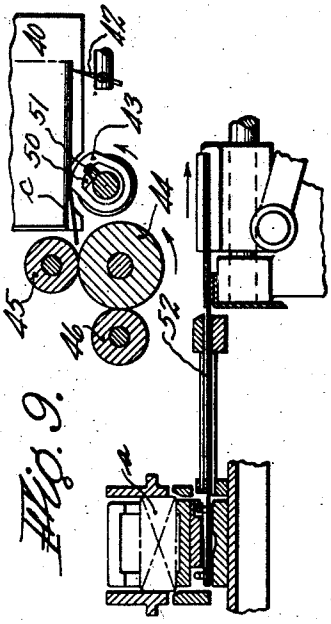

Fig. 9.

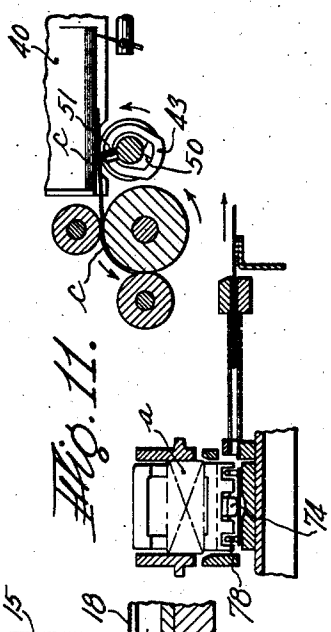

Fig. 11.

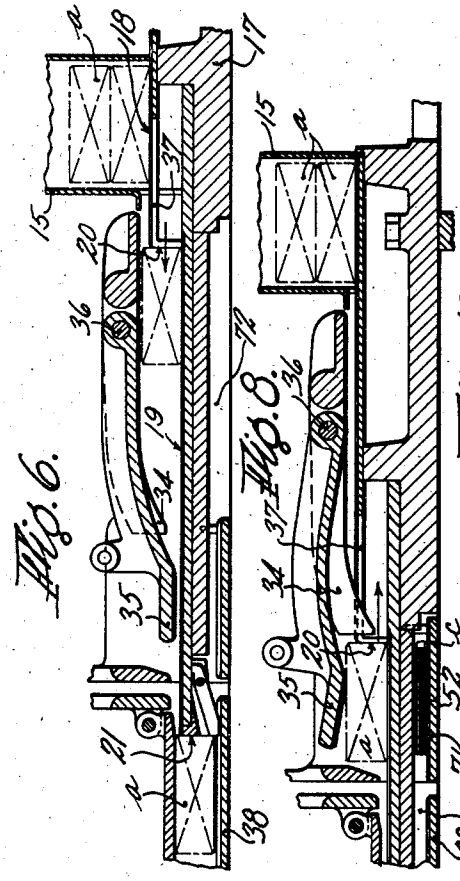

Fig. 6.

Fig. 8.

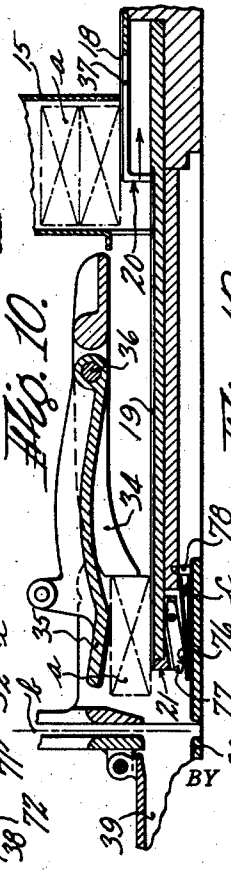

Fig. 10.

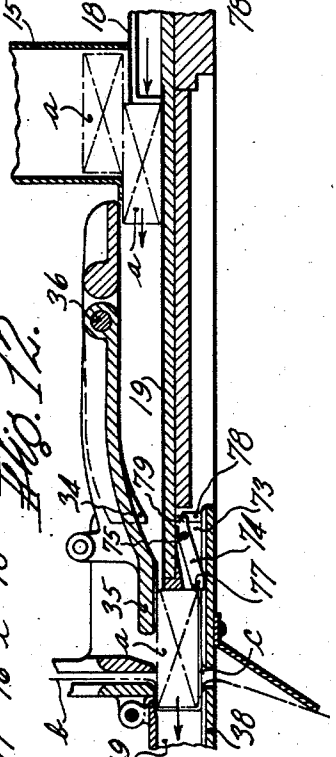

Fig. 12.

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COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

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Fig. 14.

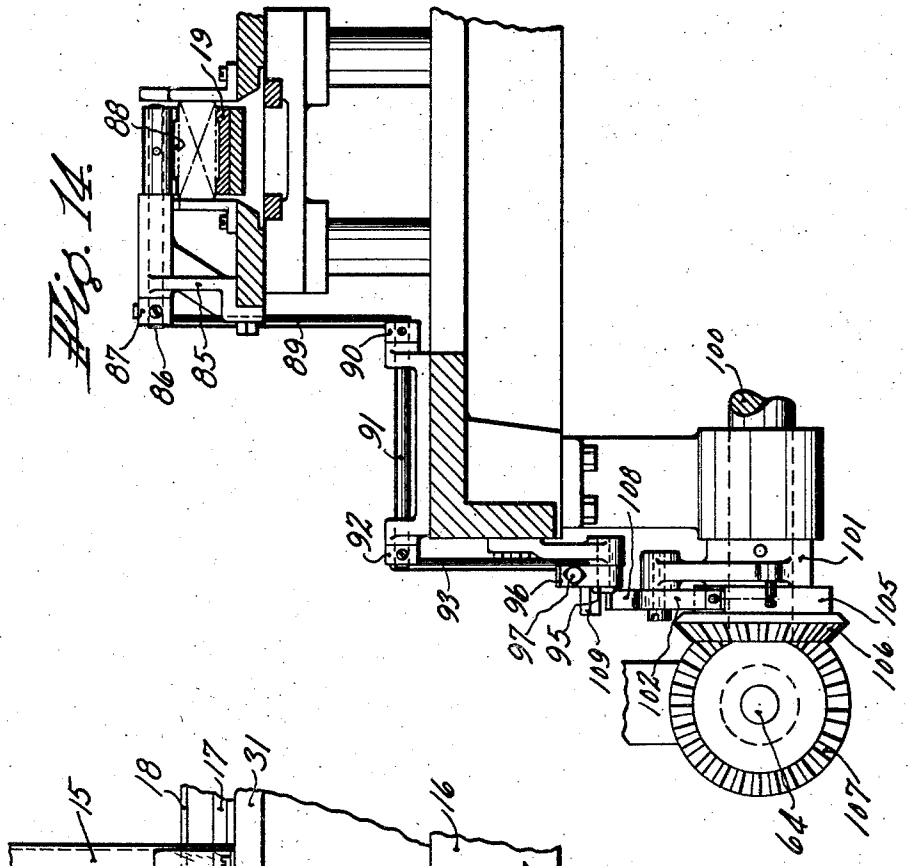
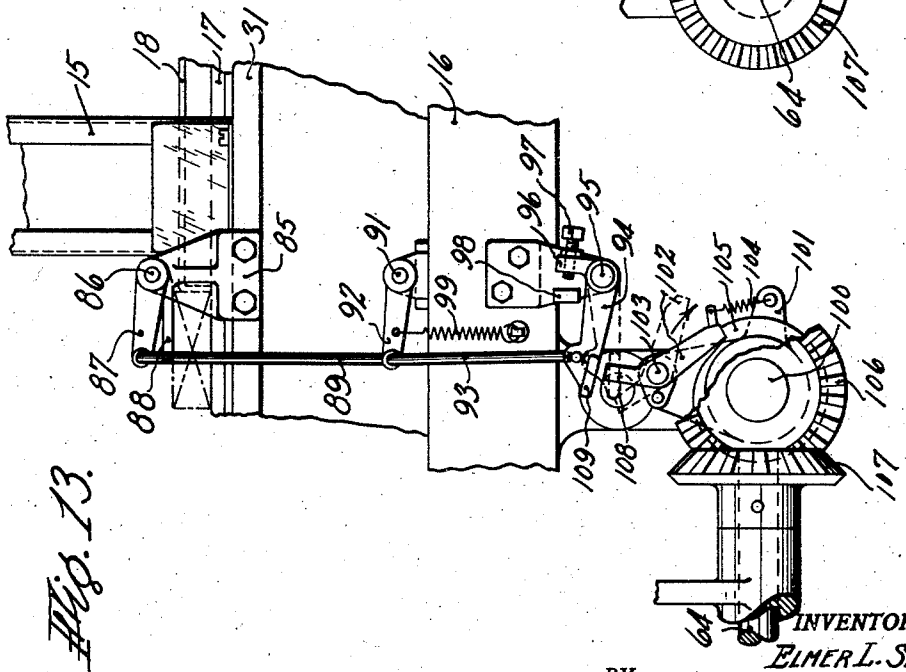


Fig. 13.



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COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

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Fig. 16.

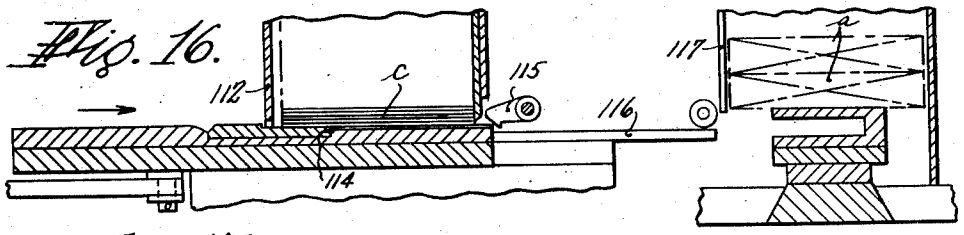


Fig. 17.

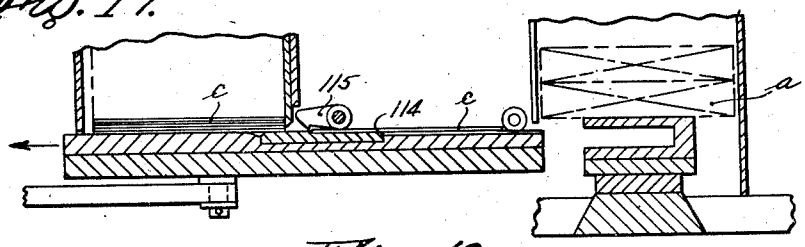


Fig. 18.

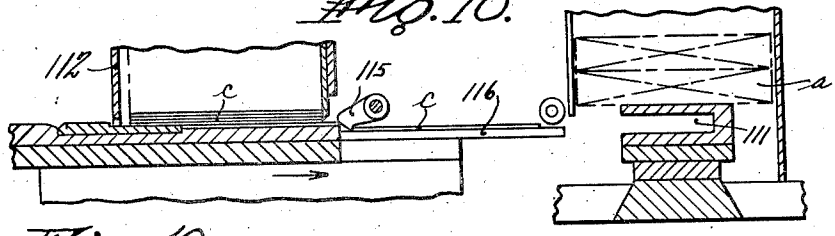


Fig. 19.

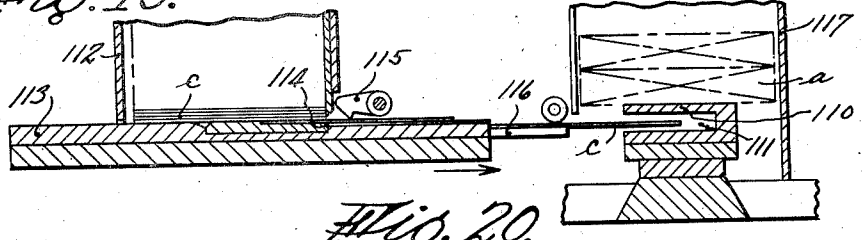


Fig. 20.

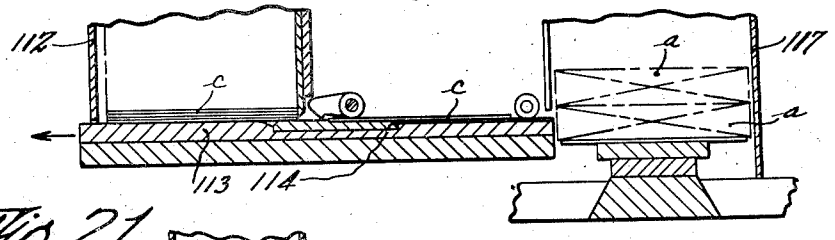
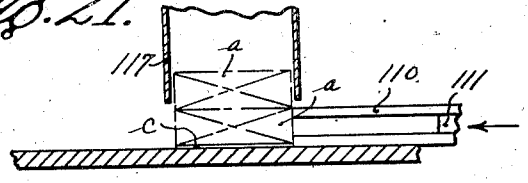


Fig. 21.



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Patented June 13, 1933 1,913,642

UNITED STATES PATENT OFFICE

ELMER L. SMITH, OF LONGMEADOW, MASSACHUSETTS, ASSIGNOR TO PACKAGE MACHINERY COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

COUPON INSERTING MECHANISM FOR WRAPPING MACHINES

Application filed July 16, 1932. Serial No. 622,992.

This invention relates to improvements in mechanism for associating coupons with articles during their introduction into a wrapping machine. Specifically the invention relates to the introduction of a folded coupon, although in some aspects it is not limited to this use. One object of the invention is to increase the permissible speed of operation of the machine by making the coupon introducing mechanism independent of the position of the plunger which carries the article into the wrapping mechanism. Another object is to improve the manner of securing accurate registration of the coupon with the article. Another object is to provide improved mechanism for preventing the feed of a coupon in the event that an article is absent. Additional objects will appear from the following description and claims.

Referring to the drawings—

Fig. 1 is a sectional view, taken transversely of the wrapping machine, illustrating the mechanism for supplying folded coupons to the main feed slide of the wrapping machine;

Fig. 2 is a diagrammatic plan illustrative of the relative positions of the main feed slide, the article supply and the coupon supply;

Fig. 3 is a longitudinal section through the main feed slide of the machine;

Fig. 4 is a detail of the main feed slide looking from the right in Fig. 3;

Fig. 5 is a sectional view of the main feed slideway looking from the left in Fig. 3 and showing the article and coupon feeding plunger head on;

Figs. 6 and 7 are sections respectively through the main feed slide and the coupon feed, showing the relative position of the parts just prior to the introduction of a coupon into the feed slide;

Figs. 8 and 9 are similar views showing the coupon in place beneath the article feed plunger;

Figs. 10 and 11 are similar views showing a later stage;

Fig. 12 is a view similar to Fig. 10, showing the article and the coupon being forwarded to the wrapping mechanism;

Fig. 13 is a side elevation, looking in the direction of Fig. 3, showing the mechanism for controlling the feed of a coupon in accordance with the presence or absence of an article;

Fig. 14 is a transverse section through the machine showing the control mechanism in end elevation;

Fig. 15 is a diagrammatic plan of a modification;

Figs. 16 to 20 are transverse sections of the modification of Fig. 15; and

Fig. 21 is a longitudinal section thereof.

Since the wrapping mechanism in itself forms a part of the present invention only in its broad aspects and as an element in combination with the coupon feed it will not be described in detail. The wrapping machine to which the present invention has been applied is preferably of the type shown in the Armstrong Patents 1,244,277, Oct. 23, 1917, and 1,308,321, July 1, 1919, and reference may be made to those patents for a complete description of those features of the machine relating purely to its wrapping functions. In the present drawings the path of the article has been followed from the magazine from which it is fed up to the point of its association with the coupon; the path of the coupon has been followed from its supply magazine up to the same association point; and the common path of the associated article and coupon has been followed up to their initial presentation to the wrapper in which they are to be enclosed. Further stages of the enveloping operation may be the same as in the Armstrong patents cited, or another type of wrapping mechanism may be substi-

tuted in accordance with the nature of the package to be produced.

The articles *a* are initially stacked in a hopper 15 mounted on the machine frame 16. Reciprocating under this hopper is a main feeding plunger 17 of the double elevation type, having horizontal supporting surfaces 18 and 19 and vertical pushing faces 20 and 21. The plunger 17 has a lug 22 joined by an adjustable link 23 to the upper end of a slotted arm 24 pivoted at 25 to the frame. Within the slot slides a block 26 mounted upon a pin 27 on the end of a crank 28 carried by a constantly rotating shaft 29. As the shaft rotates the plunger will be reciprocated forward and back, the return motion to the right in Fig. 3 being faster than its forward motion. As shown in Fig. 4 the plunger preferably has slanting sides 30 held down by gibs 31 and bears at its bottom on hardened pieces 32.

In the position of Fig. 10 the plunger is returning to its rearmost position, and the article in the magazine supported by the upper surface 18 is about to fall off in front of the first pushing face 20. The article which the present machine was designed to wrap has a label extending around it, and for this reason the supporting surfaces 18 and 19 have shallow grooves 33 (Figs. 4 and 5) formed in them to avoid injury to the label, the article being held only at its lateral margins. The article is advanced by the pushing face 20 until it passes under a pair of laterally spaced latches 34 and a presser 35, each freely pivoted on a shaft 36. In the forward end of the upper surface of the pusher, and in the vertical face 20, is formed a slot 37 to receive the latch. As the plunger nears the forward end of its movement the latch 34 drops behind the package as in Fig. 8 and the presser 35 rides up on its top. When the plunger again recedes the package will be left (Fig. 10) resting upon the lower supporting face 19 of the plunger until the plunger has reached nearly the rearward end of its movement, when the package drops down past the pushing face 21 onto the bed plate 38 of a wrapping channel 39. The presser 35 assists in insuring a positive movement of the package onto the bed plate. Upon the next succeeding forward movement of the plunger the pushing face 21 carries the article through the wrapping channel, across which a sheet of wrapping material *b* has been placed by any suitable mechanism.

The path of the coupon *c* lies at right angles to that of the article, as will be most clearly visualized from Fig. 2. The coupon magazine 40 is supported on a bracket 41 at one side of the line of the article's advance. A needle 42 engages the rear of the underside of the stack of coupons in the usual manner, the lowermost coupon being fed out by a rotating friction segment 43. Forwarding rolls 44, 45, and 46 seize the coupon as it is projected from the magazine by the segment and direct it into a vertical guideway 47 in which it falls to rest against adjustable stop pins 48. To avoid frictional disturbance on account of the fact that the forwarding rolls move somewhat faster than the segment the latter is mounted loosely on its constantly rotating driving shaft 49 and has a lug 50 which is contacted by a pin 51 on the shaft. This arrangement permits a positive drive of the segment during its feeding function but allows the segment to overrun its driving pin during the feeding of the coupon by the forwarding rolls.

A folding and feeding blade 52 is mounted on a slide 53 sliding on a rod 54 and having a lug 55 sliding between guide bars 56. The slide is joined by a link 57 to one arm 58 of a bell crank freely pivoted on a shaft 59. The other arm 60 of the bell crank is connected by a spring 61 with one end of a lever 62 also swinging on the shaft 59 and slotted at its other end to receive a crank pin 63 on a constantly rotating shaft 64. A set screw 65 is threaded through a lug 66 on the bell crank arm 58 so as to contact with an abutment on the lever 62, and is held in adjusted position by a lock nut 67. The blade 52 is thus reciprocated forward and back, its forward stroke being under the power of the spring 61 only so that the spring may yield if the blade encounters an obstruction. The set screw 65 forms a convenient adjustment for the forward end point of the blade's reciprocation.

As the blade 52 moves forwardly (to the left in Figs. 1 and 7) it encounters the coupon *c* which at this time is standing vertically in the guideway 47 upon the pins 48. The blade first folds the coupon transversely by forcing it between folding ledges 68 and 69, then carries it through a guideway 70, and finally positions it upon a support 71 (Fig. 8) directly beneath the article which at that time is held by the latch 34 upon the lower supporting surface 19 of the article feeding plunger 17. The bottom of the plunger is recessed at 72 so that the blade 52 with the coupon *c* folded around its end can pass under the advanced plunger without interference with it. The blade 52 immediately starts to move rearwardly (Fig. 9) while the folded coupon opens up against the lower side of the plunger and the support 71 with sufficient friction to cause it to remain in position.

The plunger 17 is itself moving rearwardly during this time and finally reaches the position of Fig. 10 which requires some further description. By this time the blade 52 has withdrawn from underneath the plunger 17, so that the latter only needs to be considered. In a slot 73 in the pushing face 21 of the

plunger is mounted a pawl 74 swinging freely upon a cross pin 75. The front end of the pawl is doubly beveled, one face 76 being shaped to clear the slot in support 71 and the bed plate 38 and the other face 77 serving as a vertical pusher for the coupon in the manner shown in Fig. 12. When the plunger is traveling rearwardly, or to the right in Fig. 10, the pawl 74 rides over the top of the folded coupon and drawing it back against a pair of stationary pins 78 secured to the support 71 so that the coupon is accurately alined across the feedway. The upper faces of these pins are preferably rounded to avoid interference with the article being moved down by the presser 35. As soon as the plunger has moved sufficiently for the pawl to clear the coupon the forward end of the pawl drops down as indicated in Fig. 12, although that figure shows a later stage than the one under discussion. A rearward extension 79 on the pawl contacts the underside of the plunger 17 so as to limit the distance it can swing, and the bottom of the forward end of the pawl is rounded as shown in Fig. 5 so as to fit into a similarly curved groove 80 extending through the support 71 and the bed plate 38. When the pawl is in the position of Fig. 12 its pushing face 77 is preferably in substantial alinement with the rear face of the article, so that as the plunger advances the coupon and the article will be lined up and carried together into the wrapping channel 39.

It will be apparent from the above description that the coupon is fed during the motion of the article feeding plunger and that there is no necessity of causing the plunger to dwell for any length of time at the rearward end of its stroke to permit the positioning of the coupon. This affords a considerable advantage as contrasted with machines such as that shown in Armstrong 1,308,321 cited above, in which the coupon is positioned in front of the article feeding plunger while the latter is held at the rearward end of its stroke. A correlated advantage is that there is more time available for the coupon placing movement of the blade 52 or equivalent device, so that this motion need not be hurried. A greater freedom is also given in the relative timing of the article plunger and the coupon placing blade, giving somewhat more freedom in design and adjustment of the coupon feeding devices. These advantages will of course be independent of the particular wrapping machine with which the device is associated, and of the specific design of the several mechanisms.

These relations in the timing of the article and coupon feeding slides are also taken advantage of in the device which controls the feed of the coupon in accordance with the presence or absence of an article. This device is shown in Figs. 13 and 14. Secured on the frame 16 is a bracket 85 in which rocks a shaft 86 provided with an arm 87 and a feeler 88 adapted to rest upon the articles as they are pushed out of the magazine 15. Arm 87 is joined by a link 89 with an arm 90 carried by a shaft 91. A second arm 92 on this shaft is coupled by a link 93 with one arm 94 of a bell crank pivoted at 95 to the frame. The second arm 96 of the bell crank bears a stop screw 97 urged towards a fixed abutment 98 by a tension spring 99 acting on the arm 92.

To a drive shaft 100 is secured a member 101 having a pawl 102 pivoted to it at 103. A spring 104 normally holds this pawl in engagement with a single toothed ratchet 105 secured to a bevel gear 106 and freely rotatable upon the shaft 100. Gear 106 is in constant mesh with a similar gear 107 on the shaft 64 which operates the coupon feed. The tail 108 of the pawl is positioned so that upon its rotation in the direction of the arrow in Fig. 13 it will strike a lug 109 on the bell crank arm 94 when this is lowered into the dotted line position of Fig. 13 by the absence of an article. When this occurs the pawl will be raised clear of the ratchet and the rotation of shaft 64 stops, arresting the action of the coupon feed for the remainder of the cycle.

Due to the fact that the coupon can be inserted under the plunger while the latter is advanced, the coupon feed is inactive at the time when the article is just being advanced from the hopper 15 (compare Figs. 1 and 3). If no article is fed out of the hopper the pawl 102 is disengaged from the ratchet and the coupon feed is stopped while still in this inactive position. It will be observed from Fig. 1 that at this time the crank pin 63 is traveling through a substantially circular portion of the slot in lever 62 and is, therefore, causing no motion of the lever or of the parts operated by it. The result of this is that when the pawl 102 is again allowed to engage the ratchet by the emergence of an article from the magazine the only load on the shaft 64 is the inertia of the crank disk. Much less strain is exerted on the ratchet and its attendant parts than would be the case were the interruption in the action of the coupon feed to take place at some other point in the cycle.

In Figs. 15 to 21 are shown a series of views illustrating the operation of a slightly modified insert feeding device. In this case a single elevation plunger 110 is used, having a groove 111 along its side adjacent the insert magazine 112. The slide 113 which delivers the inserts from their magazine is provided with a feeding shoulder 114, and has a stroke sufficient to carry the insert from the magazine to the position of Fig. 17. A latch 115 prevents backward movement of

the insert with the slide, so that it drops off the end of the slide onto a support 116 when the slide recedes, as in Fig. 18. On the next forward stroke of the slide the card is pushed forwardly by the slide end, as in Fig. 19, into the groove 111. The plungers are so timed that the insert is being fed into the slot during the backward motion of plunger 110, and while it is still supporting the lowermost article in the magazine 117; the final positioning of the card not being completed until the plunger has reached its rearmost position. The groove 111 may extend entirely through the plunger adjacent its leading end to facilitate this operation. When the plunger passes back of the magazine 117 it allows the lowermost article *a* to drop upon the bottom 118 of the guideway, falling upon the now completely positioned insert *c*. Upon the next forward stroke of the plunger the article and insert will be carried together into the wrapping machine. In order to avoid any tendency of the insert to travel backwardly with the plunger 110 it preferably passes under a roll 119 journaled adjacent the side of the article guideway.

What I claim is:

1. A wrapping machine comprising an article guideway, an article forwarding plunger spaced at its under side from the bottom of the guideway, means for feeding a coupon underneath the plunger while the plunger is advanced, and a pivoted pawl secured to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to feed the coupon forwardly during the succeeding article forwarding stroke of the plunger.

2. A wrapping machine comprising an article guideway grooved on its bottom, an article forwarding plunger spaced at its under side from the bottom of the guideway, means for feeding a coupon underneath the plunger while the plunger is advanced, and a pivoted pawl secured to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to drop into the groove in the article guideway to feed the coupon forwardly during the succeeding article forwarding stroke of the plunger.

3. A wrapping machine comprising an article guideway, an article forwarding plunger movable through the guideway and spaced at its under side from the bottom of the guideway, a blade reciprocable at right angles to the plunger and timed so as to pass into the space between the plunger and the guideway while the plunger is advanced, an aperture through which the blade moves, means for delivering a coupon into the path of the blade at the entrance to the aperture whereby the coupon will be folded upon the blade, and a pawl pivoted to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to feed the coupon forwardly during the succeeding article forwarding stroke of the plunger.

4. A wrapping machine comprising an article guideway, an article forwarding plunger spaced at its under side from the bottom of the guideway, means for feeding a coupon underneath the plunger while the plunger is advanced, a pivoted pawl secured to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to feed the coupon forwardly during the succeeding article forwarding stroke of the plunger, and a stop against which the coupon is drawn by the pawl during the rearward movement of the plunger to straighten the coupon and prevent excessive rearward movement thereof.

5. A wrapping machine comprising an article guideway, an article forwarding plunger movable through the guideway and spaced at its under side from the bottom of the guideway, a blade reciprocable at right angles to the plunger and timed so as to pass into the space between the plunger and the guideway while the plunger is advanced, an aperture through which the blade moves, means for delivering a coupon into the path of the blade at the entrance to the aperture whereby the coupon will be folded upon the blade and will then be deposited by the blade in folded condition under the plunger, a pawl pivoted to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to feed the coupon forwardly during the next succeeding article forwarding stroke of the plunger, and a stop against which the coupon is drawn by the pawl during the rearward movement of the plunger to straighten the coupon and prevent excessive rearward movement thereof.

6. A wrapping machine comprising an article guideway, a double elevation plunger reciprocable in the guideway and having its under side spaced from the bottom of the guideway, means for placing an article in front of the upper pushing face of the plunger when the plunger is retracted, means for preventing retrograde movement of the article after being pushed forwardly by the upper pushing face of the plunger, means for delivering a coupon into the space between the plunger and the guideway while the plunger is advanced, the coupon being delivered below the position to which the article is fed by the upper pushing face of the article, so that when the article is released by the lower pushing face of the plunger passing behind it the article will drop upon the previously positioned coupon, and means movable with the plunger for carrying the coupon forwardly with the article.

7. A wrapping machine comprising an ar-

ticle guideway, an article forwarding plunger spaced at its under side from the bottom of the guideway, means for feeding a coupon underneath the plunger while the plunger is advanced, and means for carrying the coupon forwardly with the article during the next succeeding article forwarding stroke of the plunger.

8. A wrapping machine comprising an article guideway, a double elevation plunger reciprocable in the guideway and having its under side spaced from the bottom of the guideway, a hopper through which the plunger reciprocates and from which an article is fed by the upper pushing face of the plunger at each cycle, a latch preventing retrograde movement of the article after being pushed forwardly by the upper pushing face of the plunger, a blade reciprocable at right angles to the plunger and timed so as to pass into the space between the plunger and the guideway while the plunger is advanced and directly beneath the position to which the article is delivered by the upper pushing face of the plunger, an aperture through which the blade moves, means for delivering a coupon into the path of the blade at the entrance to the aperture whereby the coupon will be folded upon the blade and will then be deposited by the blade in folded condition under the plunger and underneath the article, so that when the article is released by the lower pushing face of the plunger passing behind it the article will drop upon the previously positioned coupon in front of said lower pushing face, a pawl pivoted to the plunger so as to pass freely over the coupon during the rearward movement of the plunger and to feed the coupon forwardly during the next succeeding article forwarding stroke of the plunger, and a stop against which the coupon is drawn by the pawl during the rearward movement of the plunger to straighten the coupon and prevent excessive rearward movement thereof.

9. A wrapping machine comprising an article guideway, an article forwarding plunger reciprocable in the guideway, the plunger having an upper article supporting surface and presenting a space below it into which an insert may be placed, means for feeding an insert into the space beneath the plunger while the plunger is advanced and supporting an article, whereby the article will drop upon the insert when the plunger is retracted, and means carried by the plunger for forwarding both the article and the insert.

10. A wrapping machine comprising an article guideway, an article forwarding plunger reciprocable in the guideway, the plunger having an upper article supporting surface and presenting a space below it into which an insert may be placed, means for feeding an insert into the space beneath the plunger while the plunger is advanced and supporting an article, whereby the article will drop upon the insert when the plunger is retracted, means for maintaining the insert against retraction by the plunger, and means carried by the plunger for forwarding both the article and the insert.

11. A wrapping machine comprising an article magazine, an article guideway, an article forwarding plunger reciprocable through the magazine and along the guideway, the plunger having an upper article supporting surface and a space below said surface into which an insert may be introduced, means for feeding an insert into the space beneath the plunger while the plunger is advanced and supporting an article in the magazine, whereby the article will drop upon the insert and in front of the plunger when the latter is retracted, means for maintaining the insert against retraction by the plunger, and means carried by the plunger for forwarding both the article and the insert.

12. A wrapping machine comprising an article magazine, an article guideway, an article forwarding plunger reciprocable through the magazine and along the guideway, the plunger having an upper article supporting surface and a side opening slot below said surface into which an insert may be introduced, means for feeding an insert into the plunger slot while the plunger is advanced and supporting an article in the magazine, whereby the article and the insert will drop to the bottom of the guideway when the plunger is retracted, a roller under which the insert is fed to prevent movement of the insert by the plunger until the insert is fully positioned, and means carried by the plunger for forwarding both the article and the insert.

13. A wrapping machine comprising an article guideway, an article forwarding plunger reciprocable in the guideway, the plunger having an upper article supporting surface and presenting a space below said surface into which an insert may be introduced, an insert feeding plunger movable at right angles to the article feeding plunger, and means for operating the plungers in timed relation whereby the insert feeding plunger will introduce an insert beneath the article supporting surface of the article forwarding plunger while the latter is advanced and supporting an article.

14. A wrapping machine comprising an article guideway, a double elevation article forwarding plunger reciprocable in the guideway and having front and rear pushing faces and a forward article supporting surface and presenting a space below said surface into which an insert may be introduced, an insert feeding plunger movable at right angles to the article feeding plunger, means

for operating the plungers in timed relation whereby the insert feeding plunger will introduce an insert beneath the article supporting surface of the article forwarding plunger while the latter is advanced and supporting an article, and means responsive to the absence of an article being forwarded by the rear pushing face of the plunger to arrest the movement of the insert feeding plunger at the outermost limit of its motion.

In testimony whereof I have affixed my signature.

ELMER L. SMITH.