

Sept. 28, 1943.

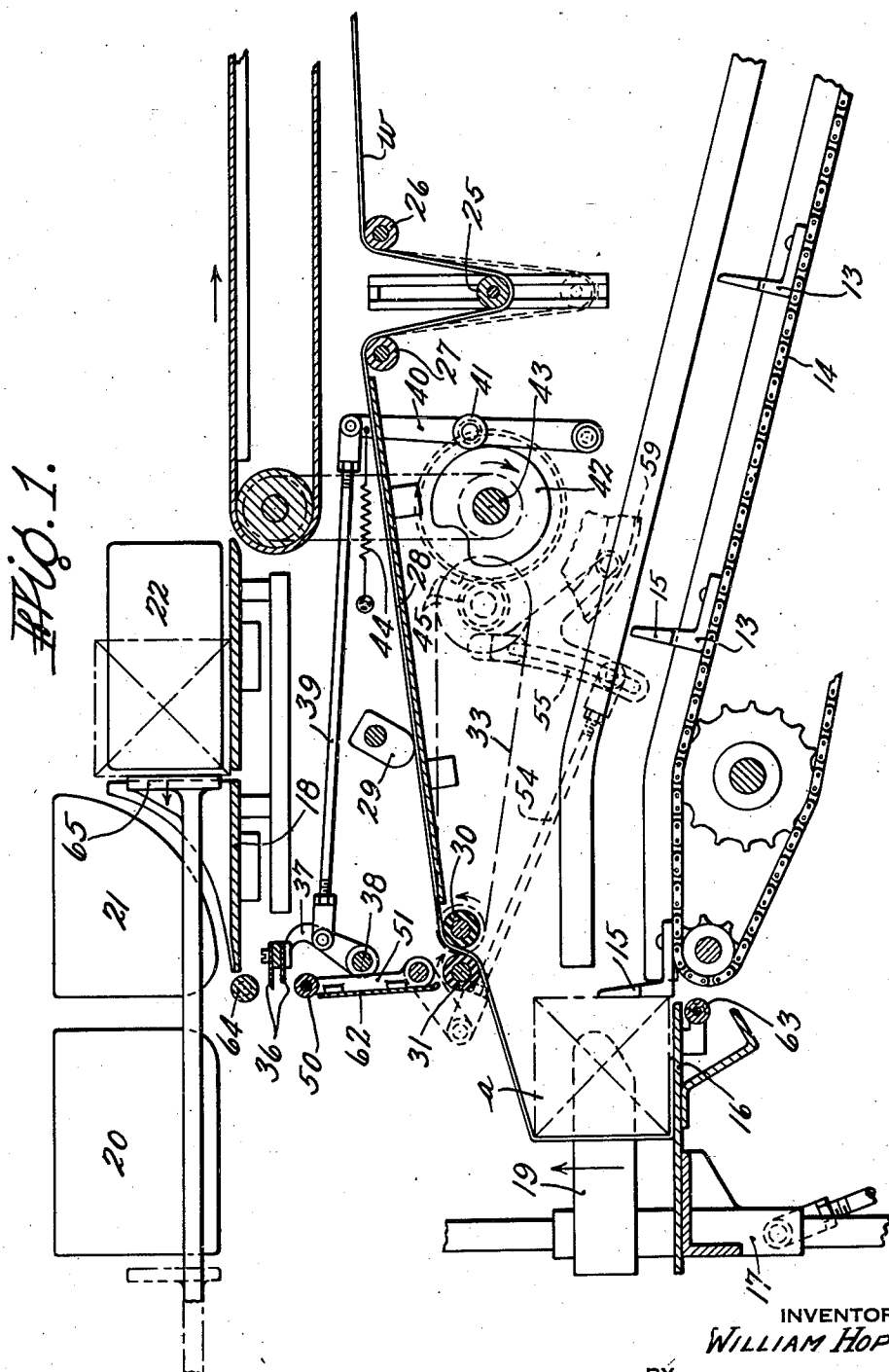
W. HOPPE

2,330,715

WRAPPER FEED FOR WRAPPING MACHINES

Filed March 13, 1942

5 Sheets-Sheet 1



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Fig. 2.

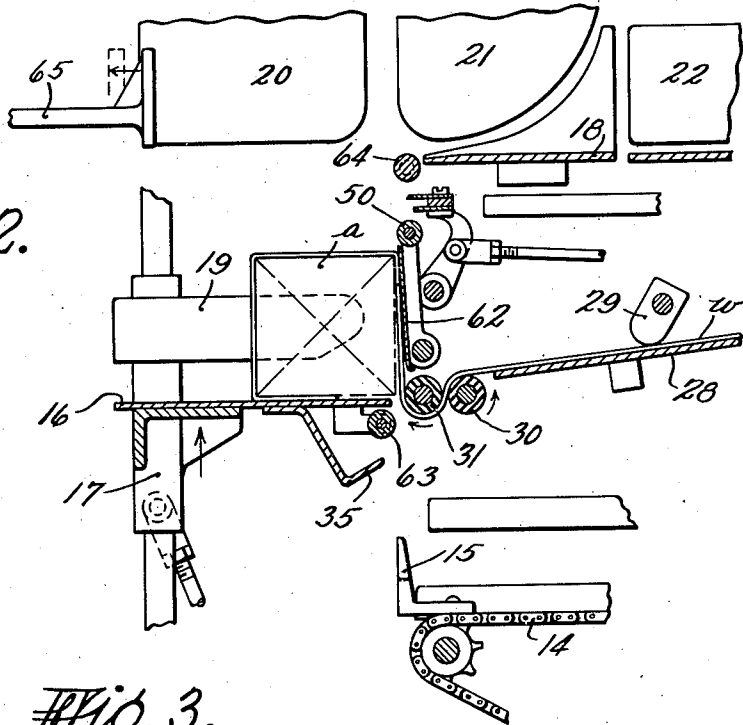
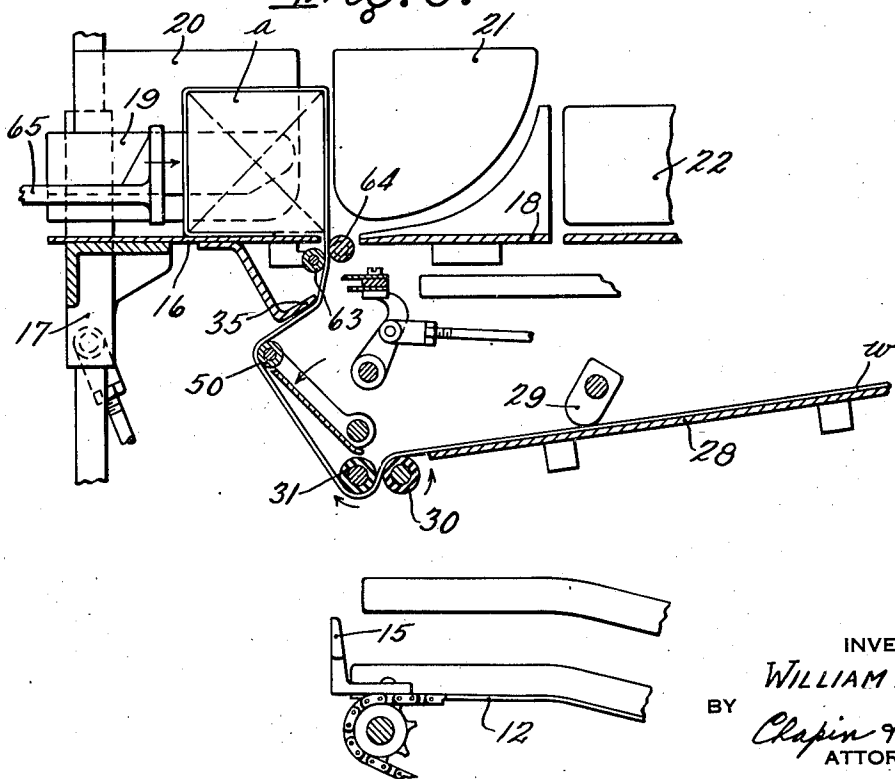


Fig. 3.



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Fig. 4.

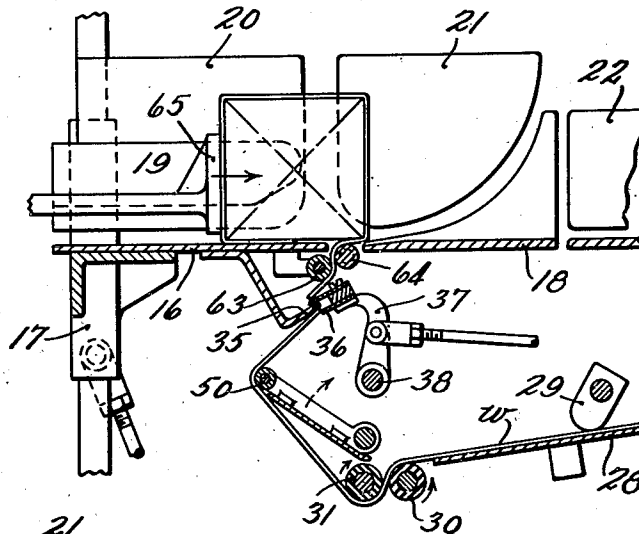
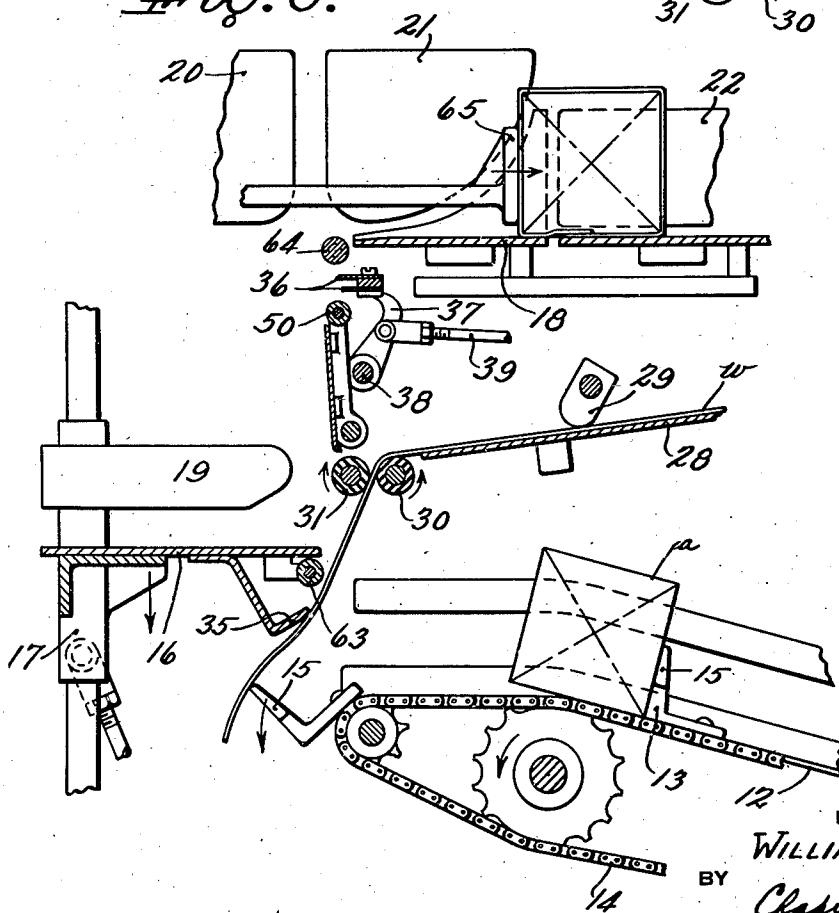


Fig. 5.



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Fig. 6.

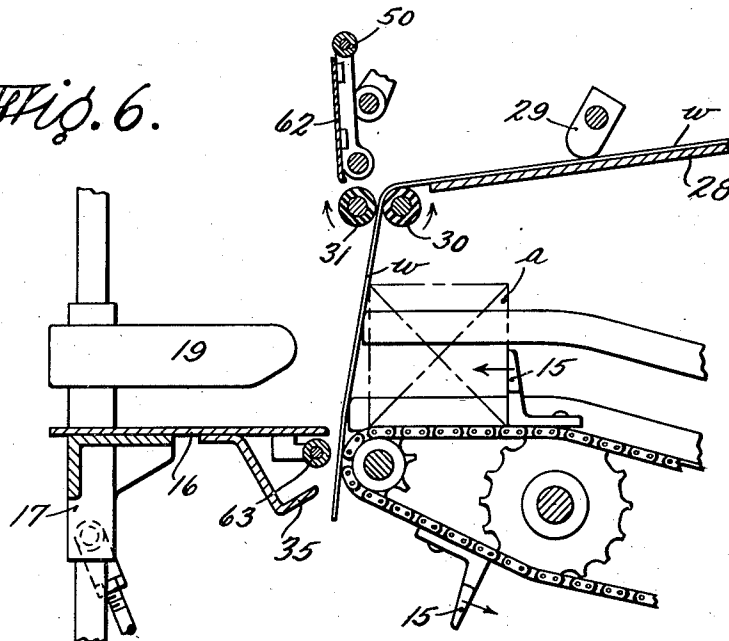
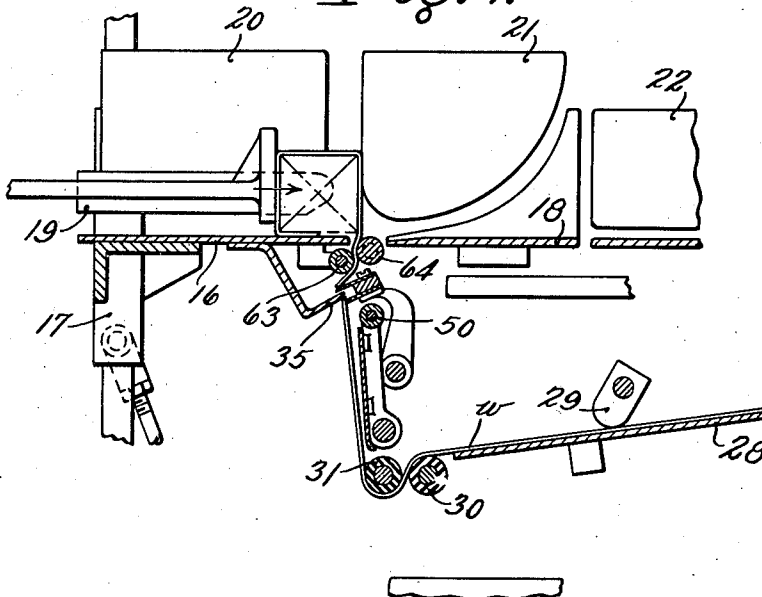


Fig. 7.



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Fig. 8.

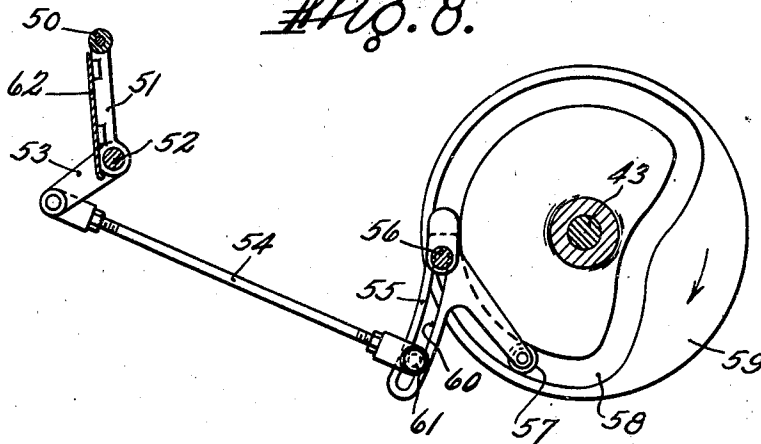


Fig. 9.

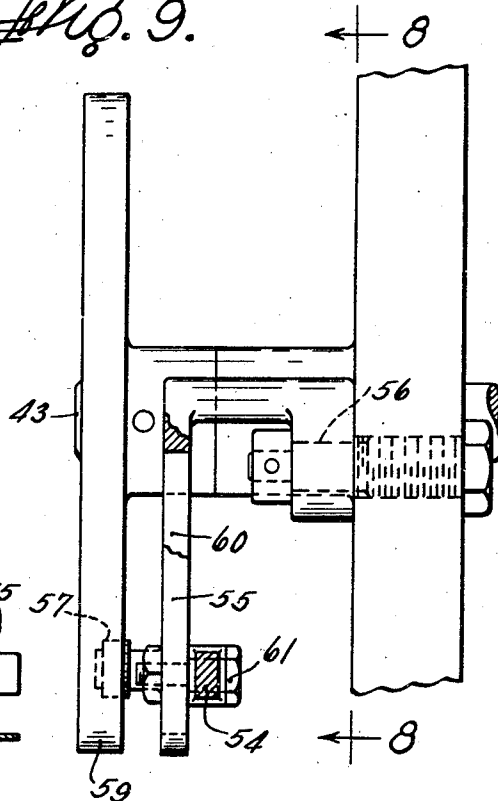


Fig. 10.

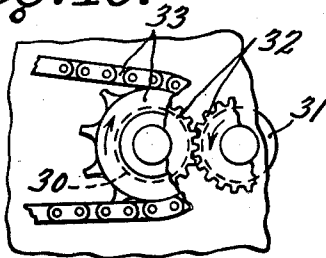
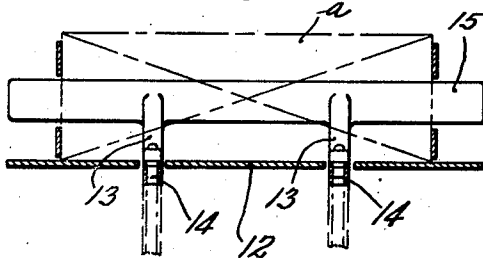


Fig. 11.



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UNITED STATES PATENT OFFICE

2,330,715

WRAPPER FEED FOR WRAPPING MACHINES

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field, Mass., a corporation of Massachusetts

Application March 13, 1942, Serial No. 434,486

6 Claims. (Cl. 93—2)

This invention relates to improvements in the handling and feeding of wrapper webs in machines of the general type shown in my prior Patent 2,273,961, granted February 24, 1942. In that machine the web was fed positively by a pair of continuously rotating rolls which stayed in feeding contact only so long as was necessary to deliver a length of web sufficient to make the desired initial contact with the article, the rolls being thereafter separated to feed the web as the movement of the article caused the leading edge of the web to be pulled against one or the other of them under tension.

While that device proved itself eminently satisfactory, particularly for high speed machines, it has proved desirable to improve upon it in the matter of simplicity and expense for use in other types of wrapping machines, such as machines where low speed is not objectionable or machines in which a different type of article carrier is used. In the feeding mechanism shown in the cited patent some mechanism was necessary to prevent the action of the feed rolls in case no article was presented for wrapping. In the present construction no such mechanism is required, since the rolls are fixed at a constant distance apart and only feed the web when the movement of the article causes a pull on it.

The invention will now be described with reference to the accompanying drawings, in which

Fig. 1 is a longitudinal section, partly diagrammatic, through a wrapping machine embodying the invention;

Figs. 2 to 6 inclusive are details showing stages of the operation of the mechanism succeeding that shown in Fig. 1;

Fig. 7 is a similar detail showing the adjustment of the mechanism for an article of relatively small size;

Fig. 8 is a detail of the mechanism for controlling the length of the first bottom underlap taken on line 8—8 of Fig. 9;

Fig. 9 is an enlarged side elevation thereof;

Fig. 10 is a detail of the feed roll drive; and

Fig. 11 is a detail of the infeed conveyor.

The wrapping machine comprises an infeed conveyor (Figs. 1 and 11) having a base plate 12, preferably inclined upwardly with a horizontal end, through slots in which lugs 13 of a chain 14 pass. The lugs carry pushers 15 to contact the rear face of the articles, the chain being driven intermittently by any suitable mechanism so that the pushers will advance successively to place an article upon the base plate

16 of a carrier or elevator 17 and then will remain in position to serve as a side guide as the carrier rises. The carrier is moved vertically by any suitable mechanism, such for example as is shown in the Smith & Hoppe Patent 1,953,195, April 3, 1934. The elevator reciprocates up and down between the horizontal end of plate 12, which forms a loading station, and a plate 18 which forms the floor of a wrapping or delivery channel. The elevator has side tuckers 19, and the delivery channel has top, end and bottom folders 20, 21, and 22. All of these folders may be of any well known or desired construction, and since their detail forms no part of the present invention they are not further described.

The wrapper web *w* is led from a suitable source (not shown) over a floating take-up and tension roll 25, having associated guide rolls 26 and 27. From the roll 27 the web passes over a plate 28 and under a web retainer 29 which drags on the web and prevents retrograde movement. The feed rolls 30, 31 are situated at the end of the plate 28, are geared together at 32 (Fig. 10) and are driven continuously from any desired source of power by a sprocket and chain 33. In distinction from the action of the rolls in Patent 2,273,961, the rolls 30, 31 are positioned a constant distance apart and are preferably located with their axes on a line substantially at right angles to the path of travel of the elevator. Since the rolls are never in contact they cannot feed the web forwardly if its free end is merely hanging between them as in Figs. 5 and 6, the cooperation of the wrapping mechanism and of the article itself being required to tension the web around the rollers in a sinuous path as in Figs. 1 to 4 in order to cause the web to be fed out by frictional contact.

The course of the wrapping operation can best be treated by considering the wrapper as being initially in the position of Fig. 6. The article *a* will be moved by the pusher 15 into contact with the web just back of its leading end, and will pass with the web onto the elevator plate 16 and between the tuckers 19. The motion of the pusher 15 continues, and since the web is firmly anchored to the article by being folded against its bottom and sides the wrapper will be tensioned around the feed rolls 30, 31 as in Fig. 1. As long as this tension is maintained the rolls will feed the web by friction, but it is impossible to feed out too much since the slightest tendency to form slack would cause the feed to stop. It should be noted that at all times during the upward movement of the elevator the web passes through

the rolls in a sinuous path which prevents side-slip even though there may be a slight slackening of the web as the elevator carries the top of the article from the position of Fig. 1 past the feed rolls, and insures a good grip on the web in all positions of the carrier.

Since in the present case the rolls are incapable of feeding out the initial length of web shown in Fig. 5, as was the case in Patent 2,273,961, the elevator is given a nearly sufficient stroke to draw out a length of web to suit the smallest size of package which it is the purpose of the machine to wrap. The wrapper is cut off from the web only after the circumferential wrap is practically complete as in Figs. 4 and 7; a stationary cutter blade 35 being located on the elevator and a movable bifurcated cutter blade 36 being carried by arms 37 (Fig. 1) fixed to a shaft 38 and actuated by a link 39 from a pivoted arm 40 carrying a roll 41 held against a cam 42 on a shaft 43 by a spring 44. The shaft 43 may also drive the feed roll chain 33 by a sprocket and gear connection 45. As the elevator ascends the travel of the article to the position of Fig. 7 will cause the wrapper to be tensioned against the feed rolls 30, 31 and to be fed out by friction. When the position of Fig. 7 is reached the wrapper will be severed by the action of the cutter, and the severed front end of the web will swing down across the path of the advancing article as shown in Fig. 5.

The length thus fed out will be sufficient to cover the front and as much as required of the bottom of a loaf of the smallest size. For larger articles, however, this will not be enough; since irrespective of the size of the article the length of web above the cutters is substantially constant, as will be seen from a comparison of Figs. 4 and 7. It is the length of wrapper above the cutters that controls the length of the second flap folded onto the article bottom, and the length of wrapper below the cutters that controls the length of the first flap. Since the first length is substantially constant it is necessary, in order to control the overlapping of the two flaps, to vary the length of the wrapper between the feed rolls and the cutter at the time of cutting. This is done by a roll 50 carried by swinging arms 51 and movable periodically from the rest position of Fig. 1 to a variable web-deflecting position, one example of which is shown in Fig. 4. The arms 51 are secured to a shaft 52 bearing an arm 53 (Fig. 8) joined by a link 54 to a bell crank 55 pivoted on a stud 56 and having on one arm a roll 57 running in a groove 58 formed in a cam 59 on shaft 43. The second arm of the bell crank has a slot 60 in which is an adjustable pivot 61 for the link 54. The bell crank is preferably offset from its pivot stud 56 as shown in Fig. 9 in order to permit the slot to extend past it, so that the pivot may be adjusted to a position where no motion will be given to the roll 50 as is desirable for packages of the minimum size. For packages of other sizes the motion of roll 50 may be adjusted by varying the position of the control pivot 61. The motion can thus be controlled so that a relatively large amount of deflection can be given to the web as in Fig. 4 or no deflection at all as in Fig. 7. If desired an article and wrapper guide 52 may be carried by arms 51.

The completion of the circumferential wrapping operation may be accomplished in any desired way. As shown, the elevator is provided with a freely rotatable roll 63 which, when the elevator is in its upper position, abuts a roll 64

adjacent the entrance to the discharge channel. The roll 64 may be freely running, held by a brake, or positively driven as is well understood in order to control the tension of the wrapper as the latter is drawn between rolls 63, 64 as the article is fed into the delivery channel by the usual pusher 65.

What I claim is:

1. A wrapping machine having a carrier movable between loading and discharge stations, a pair of friction rolls permanently spaced from each other and located between the stations at one side of the path of the carrier, means for rotating the rolls in opposite directions whereby a web passing between the rolls and held between an article and the carrier will be fed out by friction as required by the motion of the article and carrier, and means for severing the web between said rolls and carrier, the rolls and the severing means being separated apart a distance sufficient to provide a sufficient amount of web projecting beyond the rolls at the instant of severance for contact with the next succeeding article without further feeding out of the web.

2. A wrapping machine having a carrier movable between loading and discharge stations, a pair of friction rolls permanently spaced from each other and located between the stations at one side of the path of the carrier, means for rotating the rolls continuously in opposite directions whereby a web passing between the rolls and held between an article and the carrier will be fed out by friction as required by the motion of the article and carrier, means for severing the web between the rolls and the carrier, and mechanism for deflecting the web between the rolls and the severing means, the rolls and the severing means being spaced apart a distance sufficient to provide a sufficient amount of web projecting beyond the rolls at the instant of severance of said deflected web for contact with the next succeeding article without further feeding out of the web.

3. A wrapping machine having a carrier movable between loading and discharge stations, a pair of friction rolls permanently spaced from each other and located between the stations at one side of the path of the carrier and with the line of their axes substantially parallel to said path, means for rotating the rolls in opposite directions whereby a web passing between the rolls and held between an article and the carrier will be fed out by friction as required by the motion of the article and carrier, and means for severing the web between said rolls and carrier, the rolls and the severing means being spaced apart a distance sufficient to provide a sufficient amount of web projecting beyond the rolls at the instant of severance for contact with the next succeeding article without further feeding out of the web.

4. A wrapping machine having a carrier movable between loading and discharge stations, a pair of friction rolls permanently spaced from each other and located between the stations at one side of the path of the carrier and with the line of their axes substantially parallel to said path, means for rotating the rolls continuously in opposite directions whereby a web passing between the rolls and held between an article and the carrier will be fed out by friction as required by the motion of the article and carrier, means for severing the web between the rolls and the carrier, and mechanism for deflecting the web between the rolls and the severing means, the

rolls and the severing means being spaced apart a distance sufficient to provide a sufficient amount of web projecting beyond the rolls at the instant of severance of said deflected web for contact with the next succeeding article without further feeding out of the web.

5. In a wrapping machine of the type having a vertically movable carrier, means for moving the carrier back and forth between a loading station and a discharge station, and means for feeding articles on to and off from the carrier, a pair of web feeding rolls continuously driven in opposite directions positioned between the stations with their surfaces permanently out of contact, means for directing a web to the rolls, a web retainer for preventing retrograde motion of the web, a cutter blade on the elevator, a cutter movable into cutting relation with said blade when the carrier is at the discharge position, a web deflecting roll between the feed rolls and the movable cutter, and adjustable mechanism for moving the deflecting roll underneath the carrier prior to the cutting operation.

6. In a wrapping machine of the type having a vertically movable carrier, means for moving the carrier back and forth between a loading station and a discharge station, and means for feeding articles onto and off from the carrier, a pair of web feeding rolls continuously driven in opposite directions positioned between the stations with their surfaces permanently out of contact and with the line of their axes substantially at right angles to the path of motion of the carrier, means for directing a web to the rolls, a web retainer for preventing retrograde motion of the web, a cutter blade on the elevator, a cutter movable into cutting relation with said blade when the carrier is at the discharge position, a web deflecting roll between the feed rolls and the movable cutter, and adjustable mechanism for moving the deflecting roll underneath the carrier prior to the cutting operation.

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