

Dec. 12, 1939.

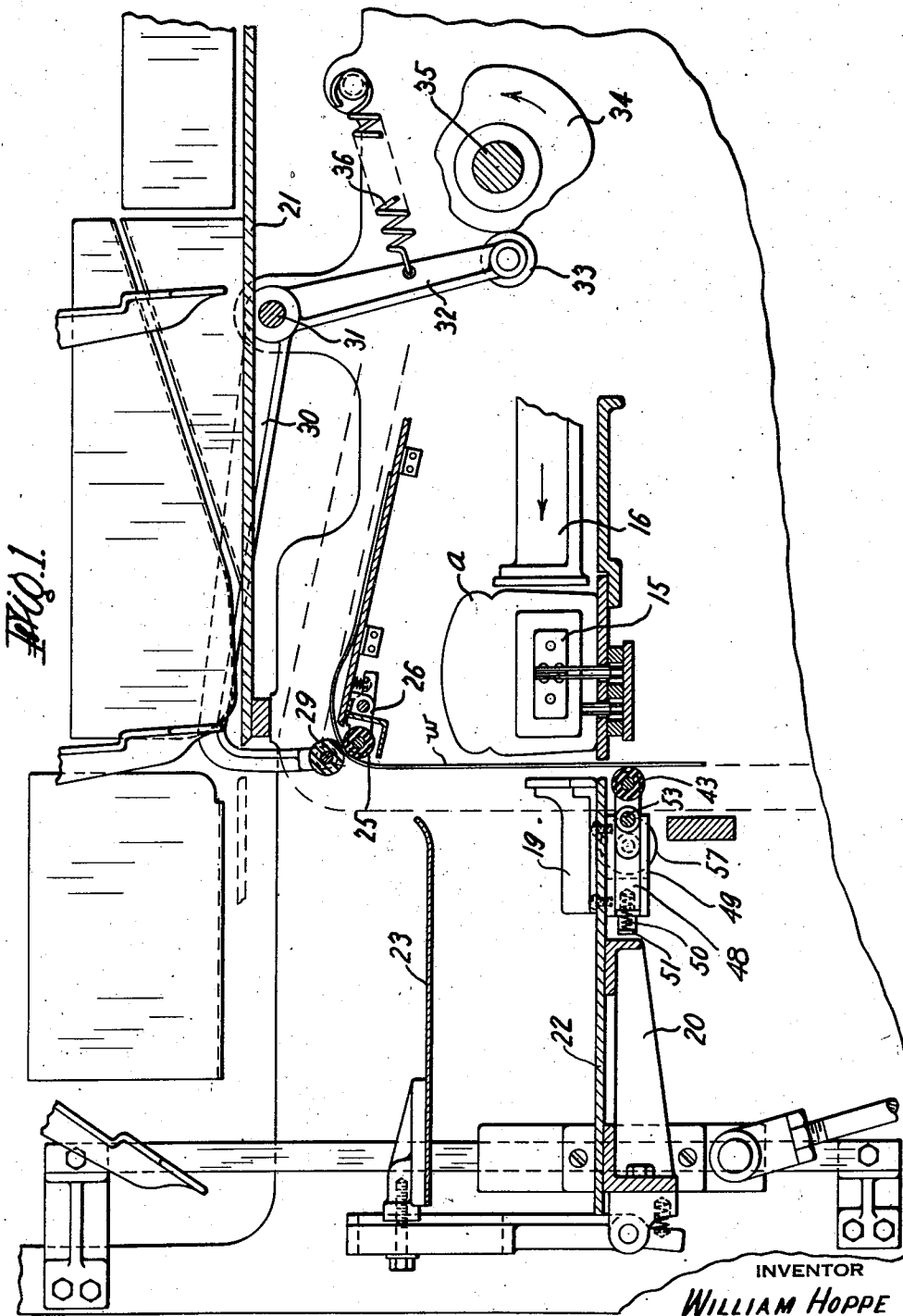
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2,183,192

WRAPPER CONTROL FOR WRAPPING MACHINES

Filed March 11, 1939

5 Sheets-Sheet 1



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Fig. 2.

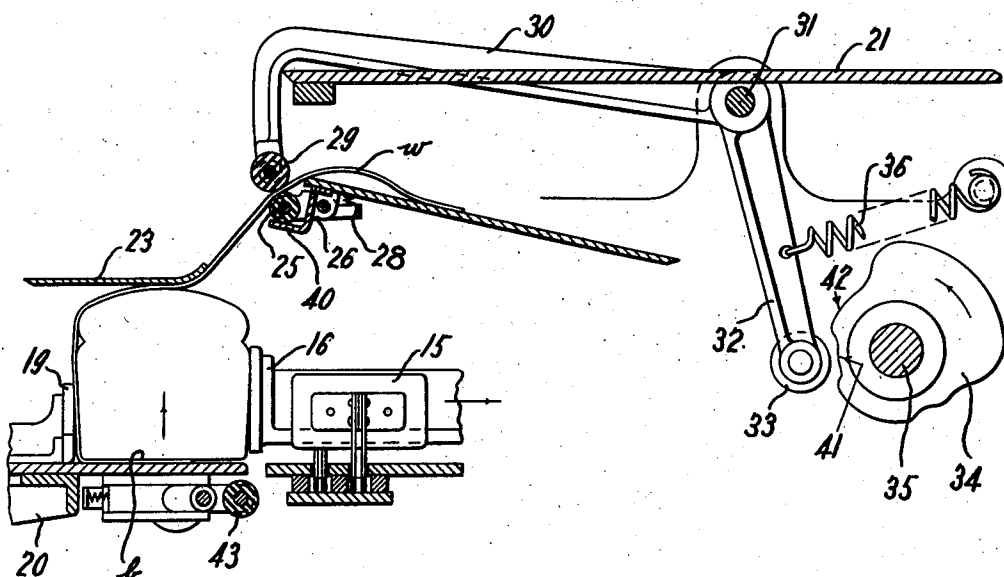
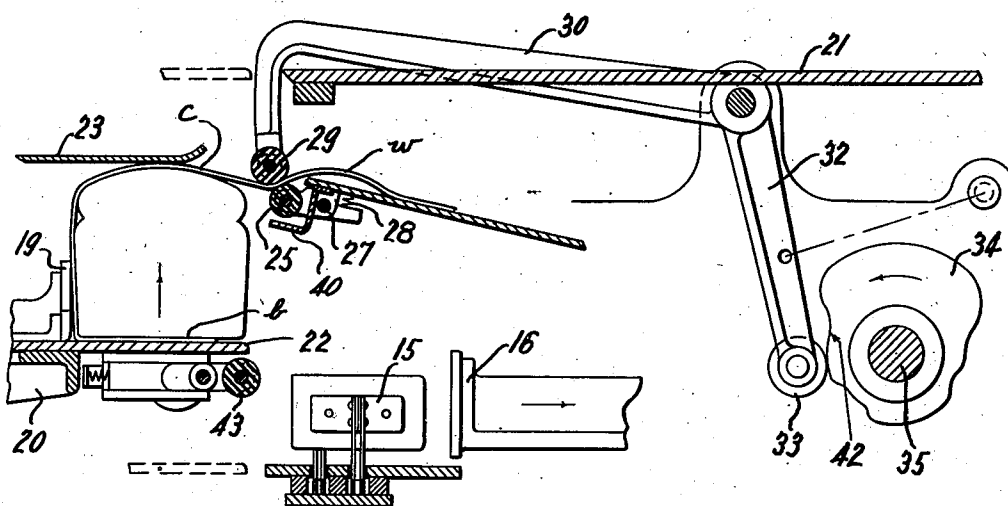


Fig. 3.



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FIG. 4.

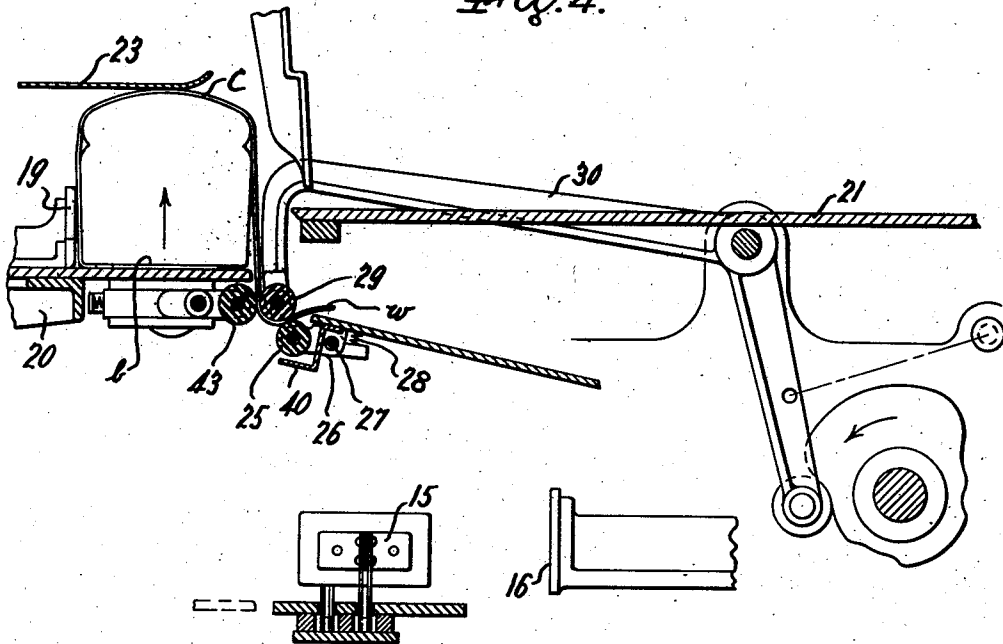
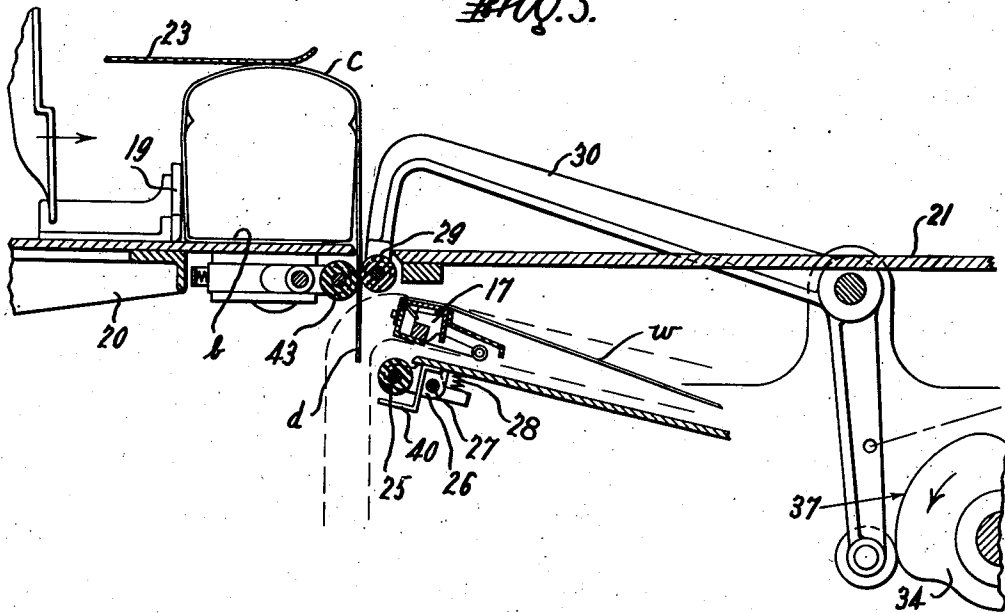


FIG. 5.



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Fig. 6.

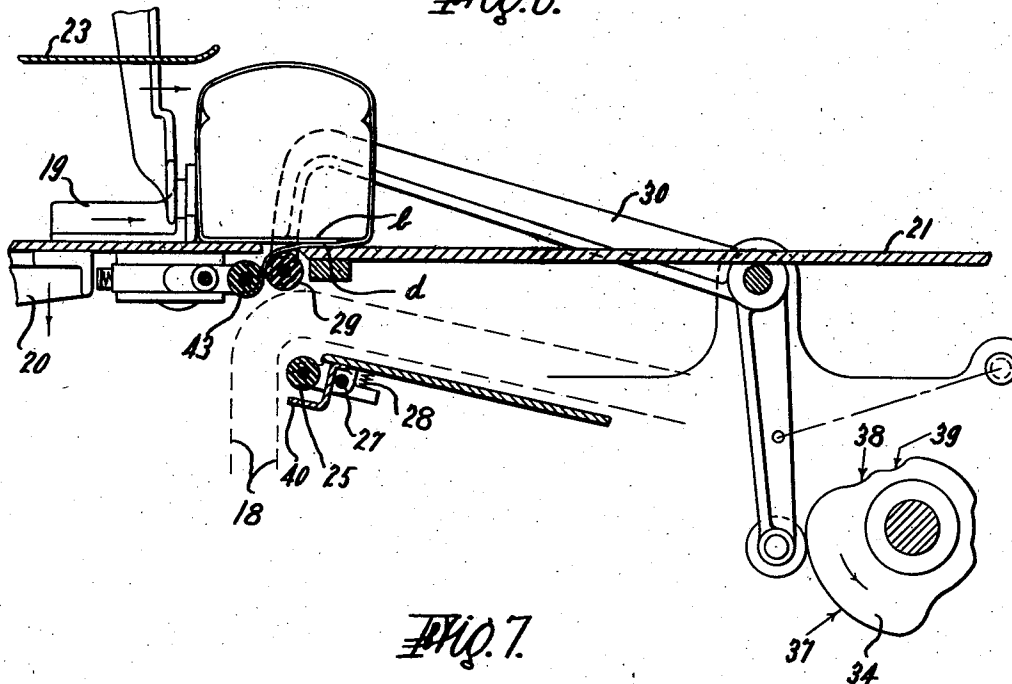
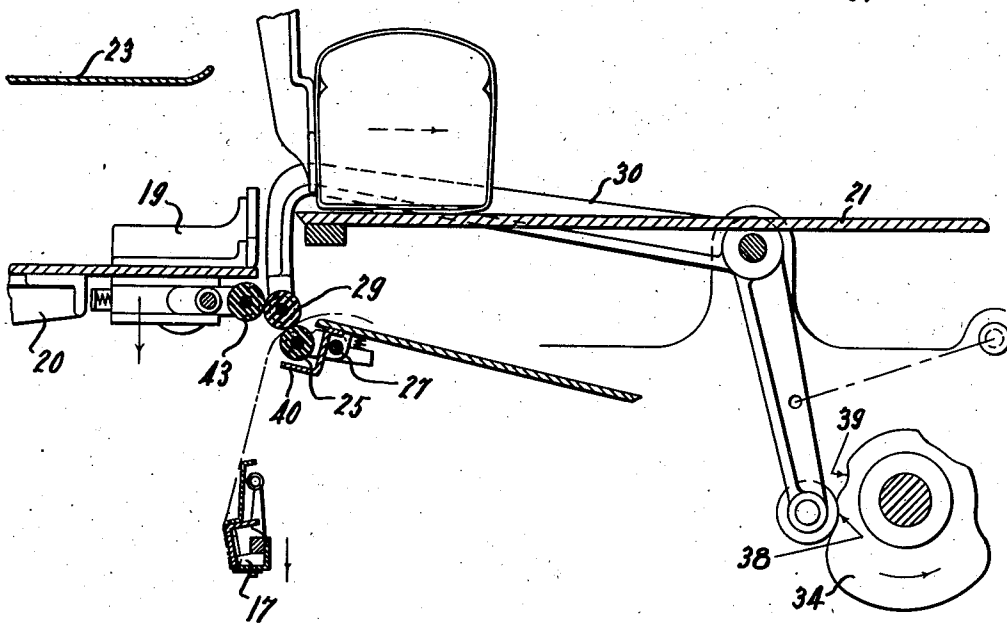


Fig. 7.



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WRAPPER CONTROL FOR WRAPPING
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Application March 11, 1939, Serial No. 261,194

5 Claims. (Cl. 93—2)

The present invention relates to improvements in mechanism for controlling the wrapper during the operation of drawing the wrapper circumferentially about the article, and has particular reference to mechanism for so controlling the wrapper when it is being drawn about articles of irregular shape such as loaves of bread.

In the wrapping of such irregular articles there is a tendency for the wrapper to skew off to one side as it is being wound circumferentially about the article, this effect resulting in an undesirable inequality of the folds of the completed wrapper. To correct this skewing tendency it has been proposed to hold the trailing edge of the wrapper by rolls or other devices which would insure that the wrapper should travel in a straight line while being wound upon the article. Such devices in general have been successful in proportion to the continuity of control that they exercised over the wrapper as the latter was being wound upon the article, but as far as I am aware no prior device has been capable of exercising complete continuity of control. In other words, while the wrapper might be guided in a perfectly straight path during a major portion of the circumferential wrapping operation, there have in prior devices always been periods when this control was completely or partially relaxed and the wrapper could skew. With articles of regular shape this lapse of control is not so important, but with irregular articles like loaves of bread even a momentary release of the wrapper may cause sufficient skewing to destroy the regularity of the folds or even the continuity of the hermetic seal given by the wrapper itself.

It is the object of the present invention to provide a mechanism by which the control of the wrapper may be continued throughout the complete circumferential wrapping of the article, so that even with irregular articles the two ends of the wrapper may be overlapped and thus held against any shifting without any opportunity being given the wrapper to skew. While the improvement may be applied to many types of wrapping machine it has for clarity been illustrated in its application to two existing machines which need not be here considered in detail since they are fully shown in issued patents.

Referring to the accompany drawings:

Fig. 1 is a fragmentary side elevation, taken substantially in median section, of a wrapping machine of the type shown in the Smith and Hoppe Patent 1,953,195, April 3, 1934, to which the present invention has been applied;

Figs. 2 to 8 inclusive are fragmentary views

similar to Fig. 1 showing successive stages in the wrapping of an article in accordance with the present invention;

Figs. 9 and 10 are fragmentary plan views of the machine showing certain roll supporting devices; and

Figs. 11 and 12 are details illustrating the application of the present invention to a machine of the type shown in the Hoppe Patent 2,043,376, June 9, 1936.

Referring first to the form of the invention shown in Figs. 1 to 9, the type of wrapping mechanism to which it has been applied will first be described briefly. The general type of machine is fully illustrated in the Smith and Hoppe Patents 1,953,195 and 1,953,196, and will be dealt with here only in broad outline. Articles to be wrapped, such as loaves of bread *a*, are fed by a cross-conveyor 15 in front of a pusher 16. A wrapper *w* has meanwhile been delivered by a gripper 17 travelling in an endless path 18 (Fig. 6) in the direction of the arrow in Fig. 7, and as the pusher moves forwardly it presses the wrapper between the advancing article and a backing plunger 19 located upon a vertically reciprocating elevator or carrier 20. This elevator reciprocates between a lower level shown in Fig. 1 and an upper level shown in Fig. 6 at which it is in line with the floor 21 of a wrapping channel of any desired type. Circumferential wrapping of the wrapper *w* around the article is attained by the movement of the article onto, with, and off from the elevator. As it goes onto the elevator the lower flap *b* is turned under the article by contact with the floor 22 of the elevator and the upper flap or central portion *c* of the wrapper is turned over the top of the article by contact with an upper plate 23 which is preferably swingingly mounted as described in Patent 2,043,376.

Returning to the manner of feeding the wrapper fully described in Patent 1,953,196 the gripper 17 travels through an endless path, picking up the leading edge of the wrapper web at a point not shown in the present drawings and depositing the cut wrapper in substantially the position shown in Fig. 1. In its travel the gripper carries the wrapper over a roll 25, mounted on arms 26 pivoted to the frame at 27 and pressed so as to urge the roll constantly upwardly by compression springs 28. At the time when the gripper carries the wrapper over the roll 25 a second cooperating roll 29 is in the elevated position shown in Fig. 6. The latter roll is carried by spaced arms 30 pivoted on the machine frame at 31 and controlled by an extension arm 32 bearing

a roll 33 bearing against a cam 34 on a constantly rotating shaft 35. The arm 32 is drawn to keep the roll 33 against the cam 34 by a spring 36. During the passage of the gripper between the rolls each roll 29 is held elevated by a high land 37 (Figs. 5 and 6) on the cam roll. As the grippers pass, the rolls 25 and 29 are brought together by the descent of the cam roll onto an intermediate land 38 on the cam (Fig. 7). In this condition the two rolls 25 and 29 are held together by the pressure of the springs 28, this compression being so regulated that the wrapper may be drawn by the gripper between the two rolls, the latter being free to rotate on their own axes. The pressure of spring 36 is so much stronger than that of spring 28 that it may be considered as shifting the roll 29 into various fixed and non-yielding positions. At the time when the gripper is opened by mechanism described in Patent 1,953,196 the roll 29 is caused to move against the roll 25 by the passage underneath the cam roll 33 of cut-away portions 39 of the cam as shown in Fig. 8. This causes the spring 36 to draw the upper roll 29 downwardly with sufficient force to carry the lower roll 25 against an abutment 40 mounted on a fixed position on the frame, and thus to stop any rotation of the lower roll. The cut wrapper is thus gripped firmly as the gripper is opened, and a definite final position of the wrapper determined irrespective of any tendency to adhere to the gripper.

As the gripper is opened the cut wrapper is thus deposited in front of the article a simultaneously advanced by the conveyor 15 in front of the pusher 16. The pusher then advances, gripping the wrapper between the article and the face of the backing plunger 19 (Fig. 1). At the same time a portion of the surface of cam 34 of approximately the same diameter as the land 38 is brought underneath the cam roll, causing the upper roll 29 to be elevated sufficiently to bring the lower roll 25 out of contact with the abutment 40 and again permitting the wrapper to be drawn through the now freely rotating rolls. The control rolls 25 and 29 are, however, preferably rubber surfaced, so that while the wrapper may be drawn freely between them it is constrained to move in a straight path and cannot move sideways.

During the first part of the passage of the article onto the elevator the control rolls are in the condition just described, the wrapper passing freely but in a controlled manner between them. After the article is fully seated upon the conveyor, however, there is no further tendency to draw out the wrapper from between the rolls for a time. During the initial rise of the elevator, from about the position of Fig. 2 to that of Fig. 3, there is a slight tendency to form slack in the portion of the wrapper between the top plate 23 and the control rolls. Were the machine to be designed for the wrapping of articles of a constant size it could be arranged so that the articles would pass from the feeding-in conveyor to the elevator very closely underneath the control rolls, and the slackening effect referred to would be practically negligible. In practice, however, the wrapping machine must be capable of handling articles of varying heights, and in the case of an article below the maximum height there will be some travel of the elevator between its lower position and that in which the top of the article comes level with the control rolls. This results in a slight formation of slack in the wrapper, which is of course taken up as the ele-

vator moves upwardly. In accordance with the present invention any tendency of the wrapper to skew during this slack period is entirely overcome by a second clamping of the lower control roll against the abutment 40. This is brought about by a depression 41 in the cam roll 34 similar to the depression 39, as is clearly shown in Fig. 2. As the elevator continues its upward movement (Figs. 3 and 4) it will draw an additional length of wrapper through the control rolls, and this is provided for by a portion 42 of the cam similar in diameter to the portions 34 and 39. Here again the control rolls are held together under spring pressure while permitting their free rotation, the wrapper passing freely between them without any possibility of skewing.

As the elevator nears the top of its movement, in which it approaches the level of the wrapping channel, the trailing end of the wrapper is about to be drawn through the control rolls, as is shown in Fig. 4. It is apparent that once this has occurred the control rolls will have lost their effect, and additional means must be provided to prevent skewing of the wrapper from this time on. In order to avoid losing control of the wrapper even for an instant the upper control roll 29 is utilized as a part of this additional control means, the wrapper being held against it by a roll 43 mounted as will be described so as to be spring pressed towards the roll 29. As will be seen in Fig. 4 the transfer of the wrapper control from the pair of rolls 25, 29 to the pair 29, 43 occurs without any break, there being a short period when the wrapper is simultaneously engaged by both pairs of rolls. As the elevator rises from the position of Fig. 4 to that of Fig. 5, where it is level with the wrapping channel, the roll 29 is raised by a portion 44 of the cam 34 so as to keep it in constant contact with the roll 43. In fact, the rise of the roll 29 is slightly faster than that of the roll 43 so as to bring it to a position just underneath the level of the wrapping channel; the roll 43, being located under the elevator, necessarily stopping slightly below this level. The control of the trailing end of the wrapper exercised by the rolls 29 and 43 is shown in Figs. 5 and 6, from which it will be apparent that the wrapper does not pass from between these rolls until the final flap *d* is brought into overlapping relation to the initial lower flap *b*.

The mounting of the roll 43 will be seen best from Figs. 1 and 9, the latter representing a broken-away plan of the floor of the elevator. The roll is fitted at its ends with bushings 45, 46 which, together with the roll, are slidable upon a rod 47 journaled in slides 48. These slides are fitted in brackets 49 secured to the lower side of the floor of the elevator, and are pressed towards the roll 29 by springs 50 located between the ends of the slides and clips 51 fastened to the brackets. The bushing 45 bears against a piece 52 slidable upon the rod 47 and upon a second rod 53 also extending between the slides 48, and which is constantly pressed against by a spring 54. The bushing 46 bears against a member 55 slidable upon both of the rods 47 and 53. A screw 56, bearing an adjusting wheel 57, is threaded through one of the slides 48, and by the adjustment of this screw the resistance to turning of the roll 43 can be regulated. The tighter the screw is made the greater will be the force required to withdraw the trailing end of the wrapper from between the rolls 29 and 43, and in consequence the tighter will be the last fold made around the article. By loosening the screw a relatively loose wrap

may be made. Such an adjustment is of value particularly on machines for wrapping bread.

In Figs. 11 and 12 is shown a modification of the apparatus described which is suitable for machines of the type shown in the Hoppe Patent 2,043,376, June 9, 1936, and Lyon Patents 2,071,548, Feb. 23, 1937, and 2,082,403, June 1, 1937. In this case the roll 29 is operated as before, but instead of the previously described mounting for the roll 43 its shaft 60 is carried by a bell crank 61 pivoted to the elevator at 62 and given a constant spring pressure by a spring 63 compressed between the horizontal arm of the bell crank and a collar 64 held in a fixed position on a pin 65 upstanding from the floor of the elevator. In its uppermost position the roll 29 strikes a plate 66 carried by a bell crank 67 pivoted to the floor of the wrapping channel at 68 and rotated in a direction to cause the plate to press against the roll by a spring 69 compressed between the vertical arm of this bell crank and a thumb nut 70 threaded on a rod 71 secured in a bracket 72 on the floor of the channel and passing through the bell crank. By adjusting this thumb nut the tightness of the wrap may be controlled. The lowermost position of the plate is conveniently regulated by lock nuts 73 on the rod. This arrangement is necessitated by physical limitations of the particular machine in question, and does not change the nature of the invention.

What I claim is:

1. In a wrapping machine of the type in which an article carrier reciprocates between spaced article loading and wrapping platforms and a wrapper is delivered between the loading platform and the carrier to be picked up by the article in transit to the carrier, and is circumferentially wrapped about the article as the article moves onto, with, and off the carrier; a stationary roll positioned on the loading platform side of the path in which the wrapper is delivered, a roll supported on the carrier adjacent the portion thereof which comes into alignment with the platforms, a movable roll, and means independent of the carrier to move the movable roll first from the wrapping platform side of the wrapper path into wrapper gripping contact with the stationary roll, the movable roll in said contact position being in position to be contacted with by the carrier supported roll during the motion of the carrier, and then to move the movable roll along a path substantially parallel with that of the carrier and in continued contact with the carrier supported roll.

2. In a wrapping machine of the type in which an article carrier reciprocates between spaced article loading and wrapping platforms and a wrapper is delivered between the loading platform and the carrier to be picked up by the article in transit to the carrier, and is circumferentially wrapped about the article as the article moves onto, with, and off the carrier; a stationary roll yieldably mounted on the loading platform side of the path in which the wrapper is delivered, an abutment against which said roll may be pressed against the resistance of its yielding mounting, a roll supported on the carrier adjacent the portion thereof which comes into alignment with the platforms, a movable roll, and means independent of the carrier to move the movable roll first from the wrapping platform side of the wrapper path into wrapper gripping contact with the stationary roll, then temporarily against the stationary roll with sufficient force

to press the latter against the abutment and thus inhibit rotation of the stationary roll, the movable roll in said contact position being in position to be contacted with by the carrier supported roll during the motion of the carrier, and then to move the movable roll along a path substantially parallel with that of the carrier and in continued contact with the carrier supported roll.

3. In a wrapping machine of the type in which an article carrier reciprocates between spaced article loading and wrapping platforms and a wrapper is delivered between the loading platform and the carrier to be picked up by the article in transit to the carrier, and is circumferentially wrapped about the article as the article moves onto, with, and off the carrier; a stationary roll positioned on the loading platform side of the path in which the wrapper is delivered, a roll supported on the carrier and yieldably pressed towards that edge of the carrier which comes into alignment with the platforms, a movable roll supported in arms journaled for swinging movement about a pivot fixed with relation to the platforms, and means for swinging said arms to move the movable roll first from the wrapping platform side of the wrapper path into wrapper gripping contact with the stationary roll, the movable roll in said contact position being in position to be contacted with by the carrier supported roll during the motion of the carrier, and then to move the movable roll along a path substantially parallel with that of the carrier and in continued contact with the carrier supported roll.

4. In a wrapping machine of the type in which an article carrier reciprocates between spaced article loading and wrapping platforms and a wrapper is delivered between the loading platform and the carrier to be picked up by the article in transit to the carrier, and is circumferentially wrapped about the article as the article moves onto, with, and off the carrier; a stationary roll positioned on the loading platform side of the path in which the wrapper is delivered, a roll supported on the carrier adjacent the portion thereof which comes into alignment with the platforms, a movable roll, and means independent of the carrier to move the movable roll first from the wrapping platform side of the wrapper path into wrapper gripping contact with the stationary roll, the movable roll in said contact position being in position to be contacted with by the carrier supported roll during the motion of the carrier, and then to move the movable roll along a path substantially parallel with that of the carrier and in continued contact with the carrier supported roll to a position immediately adjacent the wrapping platform, and adjustable means to restrain frictionally the rotation of one of the last-named pair of rolls when in the last-named position to control regulably the tension with which the final wrapper flap is drawn around the article.

5. In a wrapping machine of the type in which an article carrier reciprocates between spaced article loading and wrapping platforms and a wrapper is delivered between the loading platform and the carrier to be picked up by the article in transit to the carrier, and is circumferentially wrapped about the article as the article moves onto, with, and off the carrier; a stationary roll yieldably mounted on the loading platform side of the path in which the wrapper is delivered, an abutment against which said roll

may be pressed against the resistance of its yielding mounting, a roll supported on the carrier and yieldably pressed towards that edge of the carrier which comes into alignment with the platform, a movable roll supported in arms journaled for swinging movement about a pivot fixed with relation to the platforms, means independent of the carrier to move the movable roll first from the wrapping platform side of the wrapper path into wrapper gripping contact with the stationary roll, then temporarily against the stationary roll with sufficient force to press the latter against the abutment and thus inhibit rotation of the stationary roll, the movable roll in

said contact position being in position to be contacted with by the carrier supported roll during the motion of the carrier, and then to move the movable roll along a path substantially parallel with that of the carrier and in continued contact with the carrier supported roll to a position immediately adjacent the wrapping platform, and adjustable means to restrain frictionally the rotation of one of the last-named pair of rolls when in the last-named position to control regulably the tension with which the final wrapper flap is drawn around the article.

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