

March 17, 1942.

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2,276,590

PAPER HOLDING AND TENSIONING MEANS

Filed Feb. 27, 1939

2 Sheets-Sheet 1

Fig. 1.

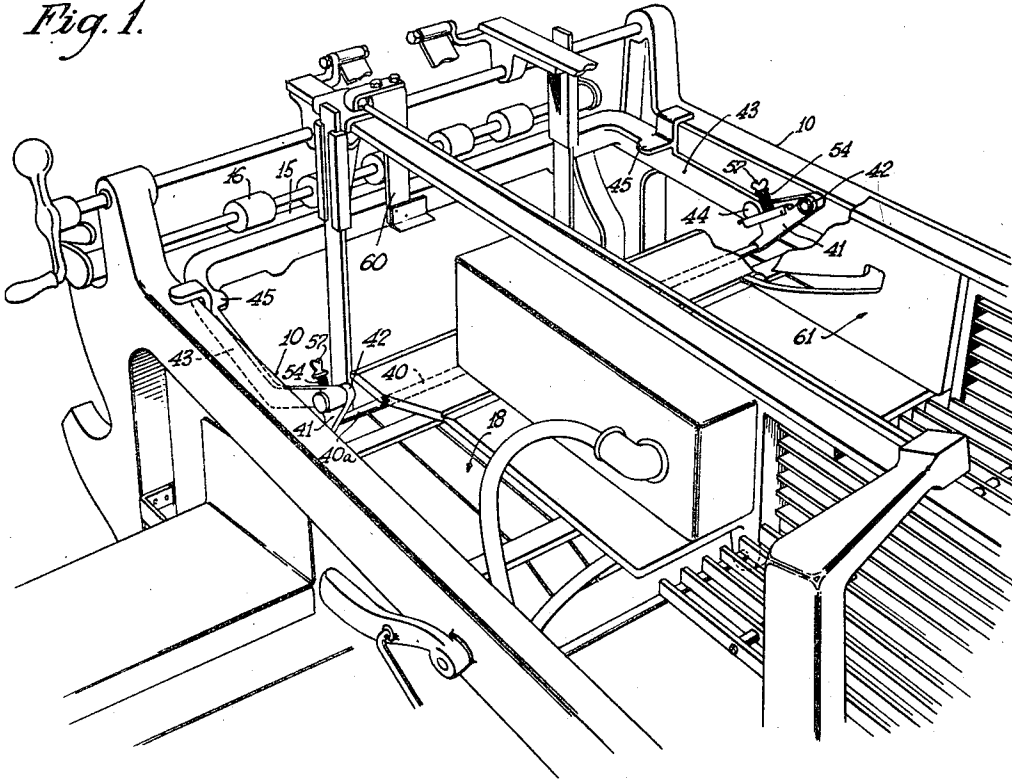
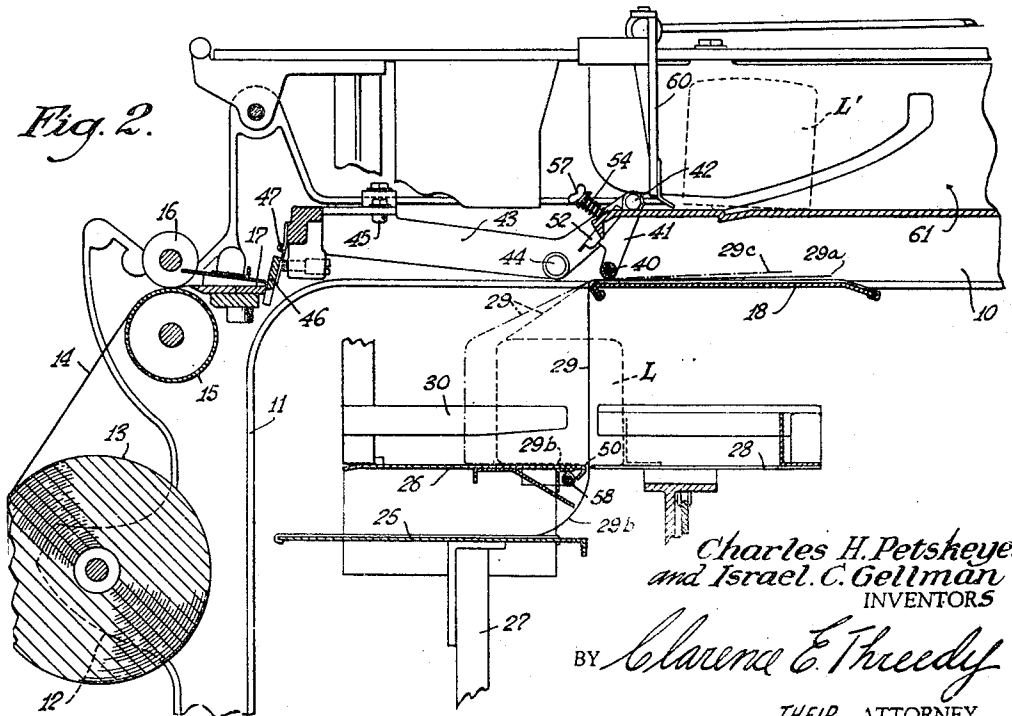


Fig. 2.



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Fig. 3.

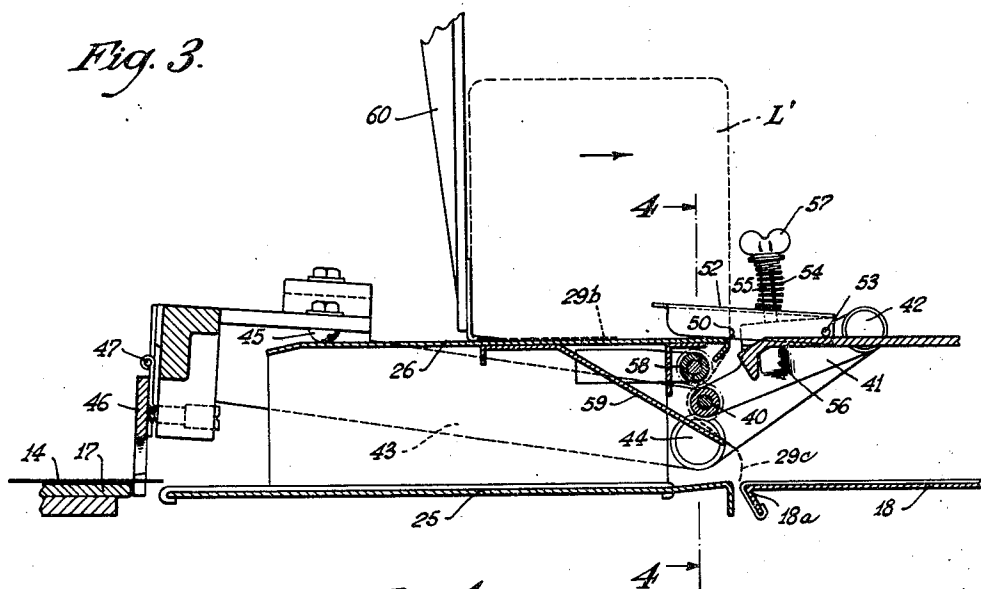
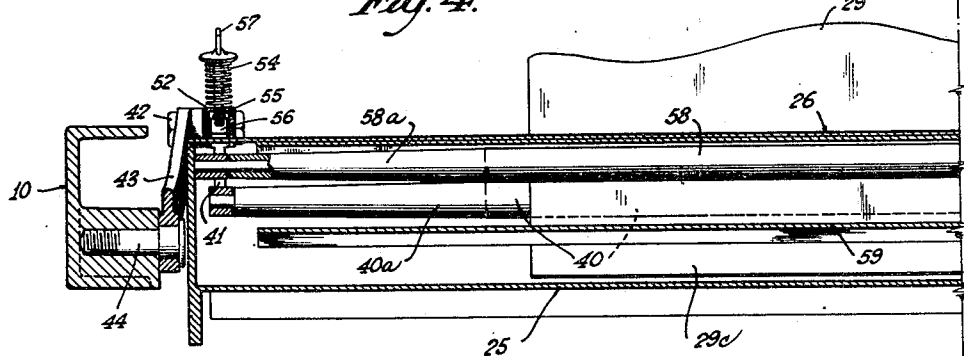


Fig. 4.



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UNITED STATES PATENT OFFICE

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PAPER HOLDING AND TENSIONING MEANS

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9 Claims. (Cl. 93—2)

This invention has as its principal object the provision of improvements in wrapping machinery and comprising means for holding and tensioning a wrapping web or paper during the wrapping operation.

Viewed from another aspect, the invention provides a paper tensioning and holding means arranged for cooperation with an article wrapping elevator in wrapping machines of general application and especially in machines adapted to wrap bread.

More particularly, the invention provides a holding bail which cooperates with an article elevator to hold one end of a piece of wrapping paper while the elevator is reciprocated in wrapping operation, the holding means being arranged and constructed to release and reengage the wrapping paper at the completion of the reciprocation or elevating cycle of the elevator so as to tension the paper on an article wrapped or substantially wrapped as a result of the reciprocating movement of the elevator.

Other objects and novel aspects of the invention reside in certain details of construction and mode of operation of the illustrative embodiment described herein in view of the annexed drawings, in which:

Fig. 1 is a fragmentary top perspective view of a wrapping machine employing the invention;

Fig. 2 is a fragmentary vertical section through the wrapping machine showing the elevator and holding means;

Fig. 3 is a fragmentary vertical section to enlarged scale of the holding means shown in Fig. 2; while

Fig. 4 is a fragmentary transverse section through the machine, viewing the holding means in the direction of line 4—4 of Fig. 3.

In the preferred form of construction, the wrapping machine includes a frame structure having opposite horizontal side rails 10 and vertical end posts 11, the latter providing a cradle support 12 (Fig. 2) for a roll of wrapping paper 13 from which the free end portion 14 of the webbing is led over a feeding roller 15 coacting with a pressing roller 16 to guide the webbing over a stationary shear or knife 17 (see also Fig. 3) which extends along one side of an opening in which an article carrier in the nature of an elevator is arranged for reciprocation, there being a holding table 18 disposed on the opposite side of the elevator opening. The feeding roller 15 is arranged for cooperation with the driving mechanism of the machine to feed the webbing 14 in timed relation to the movements of the

elevator and associated wrapping instrumentalities, all of which are not described herein since they do not constitute a part of the present invention and are not essential to an understanding of the latter.

The elevator includes a lower platform or level 25 (Fig. 2) and an upper article supporting level 26 and is mounted on a vertically reciprocating post 27 having driving connection (not shown) with the central power plant of the machine. The arrangement of the wrapping machine is such that a loaf L is transferred from a loading table 28 onto the upper level 26 when the elevator is in lowered position as seen in Fig. 2, at which time a length 29 of wrapping paper, which has been severed from the webbing 14 by means hereinafter to be described, and held at one upper end 29a on the table 18, is hanging down in the path of the transferred loaf so that as the latter is pushed automatically onto the elevator between opposite end folding arms 30, the wrapper 29 is partly folded about the loaf, further wrapping operations occurring as a result of the subsequent upward movement of the elevator into raised position.

The present invention is concerned particularly with means for holding the upward end 29a of the wrapper length during reciprocable movement of the elevator, and the further arrangement of this means for releasing the held wrapper and quickly reengaging the same in a different position to tension the partly folded wrapper about the article or loaf at the completion of the wrapping movement of the elevator.

The foregoing holding and tensioning means includes a holding bail or rod 40 (all figures) mounted to extend transversely of the machine on opposite ball or rocker arms 41. The rocker arms 41 are each pivotally mounted as at 42 at their opposite extremities (Figs. 1, 2, 3) on another and larger rocking member 43 which also coacts with the elevator in a manner brought out hereinafter, this latter rocker 43 being pivotally mounted as at 44 on the horizontal side rails 10 of the machine. Thus, the large rocker 43 rocks about a horizontal axis extending transversely of the length of the machine and parallel to the edge of the table 18, as well as the edge of the knife 17 flanking the elevator opening.

The main rocker 43 has parts 45 (Figs. 1 and 2 particularly) which are disposed over the upper level of the elevator so as to be engaged by the latter to pivot the rocker upwardly when the elevator moves into raised position, as illustrated in Fig. 3. The rocker 43 is arranged so that it will

tilt downwardly by its own weight when the elevator moves downwardly out of engagement therewith, and it is at this time that the holding and tensioning bail 40 preferably comes into play, it being pointed out that the rocker 43 is arranged to carry a movable shear or knife 46 hingedly mounted thereon as at 47 for cooperation with the stationary knife 17 when the elevator causes the rocker to move downwardly as aforesaid.

The paper feeding means is arranged to advance the webbing 14 across the opening between the knife 17 and the table 18 at a time when said opening is bridged by the lower level 25 of the elevator in its substantially raised position, and when the elevator subsequently starts down, the movable shear 46 severs the advanced web to leave a predetermined length of wrapping paper lying across the lower level 25 of the elevator with the advance or free end portion 29a of the paper lying on the holding table 18.

As the elevator moves downwardly, the free end portion 29a (full lines, Fig. 2) of the wrapper is pressed against the holding table 18 by the holding rod or bail 40, the weight of the same and its mounting rocker arms 41 pivoting at 42 being adequate to cause the bail to gravitate against the paper on the table so that the opposite or lower end of the wrapper 29b (full lines) will slide forward on the lower level 25 of the elevator as the latter descends, and the wrapper will be hanging in a substantially vertical plane by the time the upper level 26 of the elevator assumes its receiving position opposite the loading table 28.

As heretofore stated, means (not shown) operating in timed relation with the other instrumentalities of the machine, urges an article such as a loaf of bread L onto the elevator and into the depending wrapper, causing the latter to be partly draped around the loaf as shown in dotted lines in Fig. 2, it being observed that the lower end 29b of the wrapper as shown in dotted lines underlies the mid region of the bottom of the loaf. When the length of wrapping paper is first fed across onto the table 18, its upper end 29a (solid lines) lies considerably in advance (toward the right). However, as the loaf is transferred onto the elevator, its opposite ends are grasped between the end folding arms 30 which tend to prevent further slippage of the wrapper so that as the loaf continues in transferring motion into the position indicated by the dash-dot lines, the lower portions of the wrapper are prevented from slipping and the upper portions on the table 18 must yield, with the result that the upper end part 29a of the wrapping sheet assumes the dash-dot position 29c on the table 18, it being important to emphasize that the weight and arrangement of the holding bail means 40-41 is adequate to press the wrapping sheet against the table 18 with sufficient force to prevent slippage during the initial transferring movement of the loaf, but as soon as the loaf and wrapper are sufficiently wedged in between the end folding arms 30, the holding effort of the bail is overcome to the extent that the wrapper may slip on the table to relieve the tension; thereafter the upper end portions of the wrapper are substantially anchored on the holding table and the elevator begins its return movement to raised position.

As the elevator raises the loaf upwardly, the wrapper, still held by the bail 40, is draped over the top portions of the loaf and around the side thereof nearest the table 18 until the free

end portion 29c of the wrapper is brought around so as to extend below the edge 50 of the upper level 26 of the elevator as indicated in Fig. 3, at which time the wrapper is folded substantially over the sides, top and part of the bottom of the loaf, it being necessary to fold the end portion 29c up against the bottom for sealing with the opposite end portion 29b, and it being further necessary to hold this portion 29c in position until the last bottom fold can be accomplished.

Means for effecting quick disengagement and reengagement of the bail 40 with the free end portion 29c of the wrapper to tension the latter preparatory to effecting the remaining fold includes an operating arm 52 (Fig. 3, particularly) pivotally mounted at one end 53 on the holding bail mounting arm 41 (there being one of the operating arms 52 on each of the arms 41 so that the operating means is duplicated on opposite sides of the machine), and the operating arms 52 project into the path of the upper level 26 of the elevator so that as the latter moves into raised position, the arms 52 will be raised against the tension of springs 54 carried on rods 55 threaded at their lower ends in bosses 56 formed on each of the arms 41, the upper ends of the rods 55 being provided with wing bolts 57 by means of which the tension of the springs 54 may be regulated to counteract the pivoting effort of the elevator, and when the latter moves toward substantially fully raised position the effort of the springs 54 is overcome and the bail arms 41 are lifted to disengage the bail roller 40 from the free end of the wrapper on table 18. However, the bail 40 immediately reengages the wrapper near its free end portions and urges the same against a cooperating tensioning means in the form of a roller 58 mounted on the underside of the upper platform 26 of the elevator just beneath the edgewise nose 50 thereof, so that the free end portion of the wrapper is held against means on the underside of the elevator and tensioned pending further wrapping operations, a downwardly inclined apron 59 on the underside of the top level of the elevator supporting the free end portions 29c of the tensioned wrapper in suitable position relative to the space between the lower level of the elevator and the edge of the holding table 18 pending transfer of the loaf from the elevator to terminal folding means.

It will be observed that the bail 40 would lie so close to the edge 18a of the holding table as to be in the way of the lower level of the elevator, and the bail is therefore mounted on a rocking means 43 coacting with the elevator to shift the pivot point of the holding bail at the proper time so that the bail will be disposed out of the way of the elevator when the same is in movement. It will also be observed that by disengaging and reengaging the sheet, the latter is disposed to be further tensioned by movement of the loaf onto the sealing table.

Thereafter the loaf L is moved by transfer arms 60 driven in timed relation to the movement of the elevator into raised position, off of the elevator (toward the right) in between opposite terminal folding plates 61 onto a heating table for the final folding and sealing operations, the position of the loaf being indicated at L' in Fig. 2.

When the elevator starts down at the beginning of the next wrapping cycle, it disengages the bail operating arms 52 so that the bail 40

will drop into holding engagement with another sheet of wrapping paper which has been fed over the lower level of the elevator while the latter was resting in raised position during the removal of the loaf therefrom by the transfer fingers 60.

Attention is called to the fact that the holding bail 40 is not uniformly cylindrical throughout its extent but has its opposite endwise portions provided with a taper as at 40a (Fig. 4) so that it is thicker in its mid portions than at its ends; and the cooperating tensioning roller or rod 58 is similarly provided with a taper 58a at its opposite ends. Thus, the bail 40 will grab the wrapping paper at a point between its sides when the same is lying on the table 18 and also when the wrapper is pressed against the cooperating rod or roller 58. By this means, the wrapper is given a freedom of movement in the direction transversely thereacross to facilitate the wrapping operations performed thereon.

The taper on the holding and tensioning rods 40 and 58 is exaggerated as shown in Fig. 4 for purposes of illustration, the taper in practice being proportioned to the average thickness of the wrapping paper or papers (where the thickness is doubled), and the taper is effected in a novel manner by making the members 40 and 58 of metal and plating the same heavily in their mid portions, thus providing adequately thickened mid portions on said members and also providing a uniformly smooth contact surface for engagement with the wrapping paper.

In summary, the operation of the machine is such that at the time the elevator is disposed in raised position the feeding mechanism advances the web of wrapping paper across the lower level 25 thereof to dispose the free end portion 29a on the holding table 18. Meanwhile, the transfer arms 60 are being actuated to remove a previously enfolded loaf from the elevator and transfer the same between the end fold plates 61 on the heated sealing table.

As the elevator begins its descent, the advanced web is severed by downward movement of the cutter 46 as a result of the downward movement of the rocker 43, and the bail 40 is permitted to move quickly downward to press the free end region of the severed wrapping sheet against the holding table as a result of the disengagement of the upper parts of the elevator with the bail operating arms 52, the tensioned spring means 54 operating to effect a substantially snap action of the holding bail in this respect.

Movement of the elevator into fully lowered position disposes the wrapper 29 in a vertical plane, hanging from its upper end, on table 18, and at the proper moment the article or loaf L is transferred from the loading table onto the lowered elevator and into the depending sheet of wrapping paper so that the latter is partly folded about the loaf, whereupon the elevator starts upward and the upper portions of the depending wrapper are progressively folded over the top and remaining vertical side of the loaf as the latter approaches fully raised position, the upper or free end portions of the wrapper being automatically released at the proper instant so that the same may be folded around the side of the loaf as aforesaid, and this release of the free end portions being effected by engagement of the upper parts of the elevator with the bail operating arms 52 so that the bail is quickly lifted away from the table to free the paper, the bail almost instantly reengaging the paper to press the same against the means 58

on the underside of the elevator so that the wrapper will be held under tension to prevent slippage, wrinkling, and other imperfections in the wrapping. This loaf is thereafter removed from the elevator by operation of the transfer arms 60, the paper slipping from between the holding members 40 and 58 as the loaf is moved onto the sealing table.

The objects and advantages of the invention may be realized in other arrangements and forms of construction, and the invention is therefore not limited to the descriptive embodiment set forth herein, but is to include all equivalent arrangements fairly coming within the scope of the appended claims.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In a wrapping machine, in combination, a cyclically operable article-wrapping carrier, stationary sheet holding means arranged adjacent the path of movement of said carrier, movable holding means arranged for cooperation with said stationary holding means to hold sheeting in position for wrapping on an article carried by said carrier, said carrier being arranged and constructed to effect folding of sheeting, held as aforesaid, on an article carried thereby, said movable holding means coacting with said carrier for operation periodically by the latter to engage and hold sheeting cooperably with said stationary means during a part of each cycle of movement of the carrier, said movable holding means being moved thereafter to release said sheeting from held engagement with said stationary holding means and quickly reengage said sheeting to hold the same in cooperation with holding means on said carrier during substantially the remainder of said cycle, and means for feeding sheeting into position for engagement by said movable and stationary holding means in timed relation to the movements of said carrier.

2. In a wrapping machine, in combination, a reciprocable article carrier arranged to fold a relatively stationary wrapper onto an article carried thereby, a stationary holding table mounted adjacent the path of travel of said carrier, means actuated in timed relation with the movements of said carrier for feeding a wrapper into wrapping position relative to said carrier and stationary holding means, and a movable holding means arranged for movement into and out of pressing engagement with said stationary means to hold a wrapper thereon, said movable holding means being arranged to yield when greater than a predetermined pull is exerted on the held wrapper, said movable holding means being arranged normally in pressing engagement with said stationary means and being moved out of normal engagement into wrapper releasing position when said carrier is moved substantially toward the limit of reciprocable movement in one direction and being disposed in normal pressing engagement as aforesaid during the remainder of each cycle of reciprocation of the carrier, said feeding means feeding said wrapper into wrapping position as aforesaid when said movable holding means is out of normal pressing engagement as aforesaid, said movable holding means being quickly moved to press said wrapper yieldingly against holding means on said carrier following movement to release the wrapper as aforesaid, whereby to hold the latter substantially under tension during the time said carrier remains positioned at said limit.

3. In a wrapping machine, in combination, a reciprocable article carrier, means for moving the article onto said carrier in one of its reciprocable positions, means for positioning a sheet of wrapping material across the path of said carrier in the region of the opposite reciprocable position of the carrier for support by the same, and holding means coacting with said carrier in timed relation to the movements thereof for engaging and holding an end portion of said sheet at said opposite position while said carrier is moved back to said first-mentioned position to receive an article, said sheet being of a length to be disposed in the path of said article whereby to effect a partial wrapping by movement of the article against the sheet and onto the carrier, said holding means being arranged for operation by said carrier when the same moves into said opposite position to rapidly disengage and yieldingly reengage said end portion of the sheet and tension the same pending removal of said article from the carrier.

4. In a device of the class described, wrapping mechanism including a vertically reciprocable article carrying and wrapping elevator, a stationary holding table at one side of the path of movement of said elevator near its raised position, movable holding means mounted in the region above said table and normally bearing yieldingly against the latter to engage and hold thereon one end portion of a sheet of wrapping material, means cooperable with said movable holding means and arranged to be engaged by said elevator as the latter moves toward raised position to raise said movable holding means away from said table and releasably disengage the portion of said sheet held thereby, said movable holding means thereafter being further raised to yieldingly press said end portion of the sheet against a part on the underside of said elevator to hold said sheet in wrapped condition pending removal of said article from the elevator.

5. In a wrapping machine, a relatively stationary paper holding member, an article elevator arranged to reciprocate from lowered to raised position opposite said holding member, means for feeding a wrapping sheet across the path of movement of a part of said elevator with an end portion of the wrapper projected onto said holding member, a movable holding member arranged near the upper terminal position of said elevator for movement down against said end portion of the wrapper to hold the same yieldingly against said stationary holding member while the elevator descends to dispose the remainder of the wrapper in wrapping position to receive an article moved thereagainst onto the elevator, and operating means on said movable holding member and arranged to be engaged by parts on said elevator as the latter moves toward raised position to raise the movable holding member away from the stationary holding member and free said wrapper therefrom, said movable holding member being further moved after freeing said wrapper to reengage and yieldingly urge the same against means on said elevator to hold the enwrapped portions in wrapped condition pending removal of the enwrapped article from the elevator.

6. In a wrapping machine of the type having a reciprocable wrapping elevator, means for moving an article into a wrapper held across the path of said article and onto said elevator in its lowered position, means for feeding a web of wrapper sheeting into holding position, and

means including a rockable cutter device operably controlled by said elevator when the same moves into raised position to sever said sheeting from the web, wrapper holding and tensioning means comprising: a stationary holding member opposite the raised position of said elevator and onto which a portion of said wrapper is fed by the aforesaid feeding means, and a holding bail mounted for rocking movement on said rockable device for movement independently of the latter into and out of holding engagement with said wrapper on said stationary holding member, said bail being arranged in a normal position in engagement with said stationary member to hold a wrapper thereon during the major part of each cycle of reciprocation of the elevator and being raised by means coacting with said elevator when the latter moves into raised position to free said wrapper and then reengage and press the same against holding means on said elevator, whereby to maintain the wrapper in wrapped condition pending removal of the enwrapped article from the elevator.

7. In a device of the class described including a reciprocable article carrier and a wrapper holding table arranged at one side of the path of the carrier near a terminal position thereof and upon which an end of a wrapper is automatically fed in timed relation to the movement of the carrier into and out of said terminal position, the combination with said carrier of a rocking support disposed opposite said terminal position for rocking movement in the general directions of motion of the carrier, and wrapper holding means including a pivoted presser mounted on said support for movement into and out of wrapper holding engagement with said table and wrapper holding means on said carrier, said presser being normally disposed in holding engagement with the table, and means including a pivoted arm extended from said presser for engagement by the carrier as the latter moves toward said terminal position to pivot the presser away from the table and toward said holding means on the carrier, whereby to release a wrapper held on the table and reengage the same cooperatively and yieldingly with said holding means on the carrier.

8. In a wrapping machine, the combination with a reciprocable article wrapping carrier including a presser element of means for holding one end of a wrapping sheet utilized in the wrapping operation of said carrier, said means comprising a stationary holding member adjacent a terminal position of the latter, and a rockable supporting bail mounted opposite said terminal position for rocking movement in the general direction of movement of the carrier, a pressing bail pivotally mounted on a portion of the rockable supporting bail eccentric of its pivotal axis for movement into and out of holding engagement with said stationary holding member and into and out of holding engagement with said presser element on said carrier, said pressing bail being normally urged into wrapper holding engagement with said stationary holding member, and means including an operating arm pivoted on said pressing bail and having a portion projecting into the path of movement of said carrier for engagement and actuation by the latter to move the pressing bail out of engagement with the stationary holding means for release of a wrapper held thereagainst and to further move said pressing bail into reengagement with the released wrapper to hold the same yieldingly against said pressing means on the carrier, means

for feeding an end portion of a wrapper relative to said stationary holding member when the pressing bail is released as aforesaid, and spring means arranged to restore said operating arm quickly when said carrier leaves said terminal position to effect quick restoration of the pressing bail with said stationary holding means.

9. In a device of the class described including an article carrier movable back and forth and means for feeding wrapping paper relative to the carrier for enfolding about an article on the carrier responsive to movement of the latter, the combination with said carrier and feeding means of paper holding means including a rocker mounted opposite one of the terminal positions of the carrier to rock about an axis extending transversely of the direction of movement of the carrier, a stationary holding member adjacent said rocker and on which said paper is adapted to be fed by said feeding means, a presser member movably mounted on said rocker and includ-

ing operating means arranged to be engaged by said carrier as the latter moves a certain amount toward said terminal position to move the presser member away from said table and the paper thereon, additional movement of said carrier toward said terminal position thereafter effecting movement of said presser member into engagement with a part of the carrier to press said paper against the latter for the purpose of holding the paper until said article is removed from the carrier, means yieldably urging said presser member into a normal position for engagement with said stationary holding member when said rocker is in a normal position, said carrier and rocker coacting in response to movement of the carrier away from said terminal position to effect quick movement of said rocker and presser member into said normal position to engage paper fed onto said stationary holding member.

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