

Feb. 15, 1938.

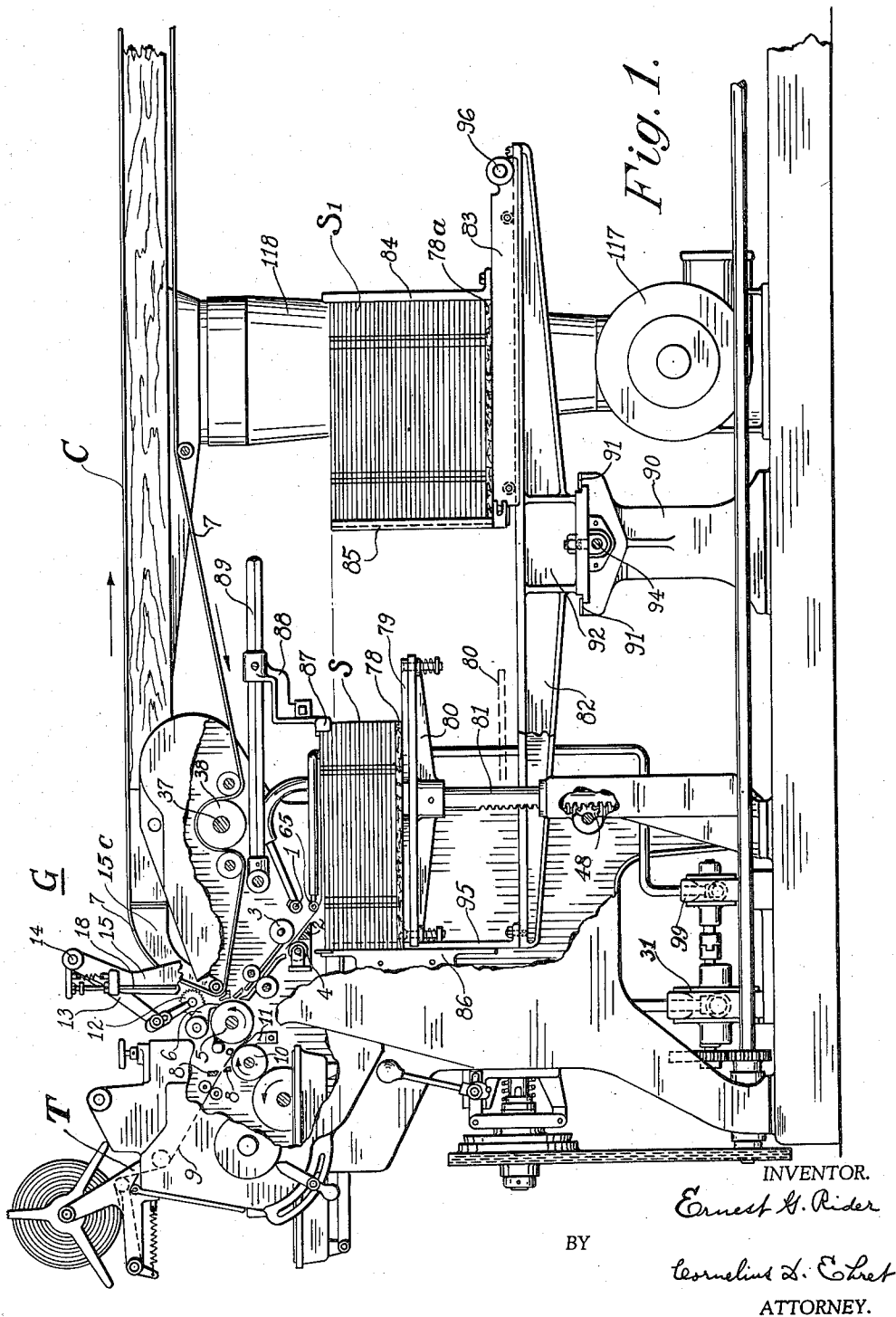
E. G. RIDER

2,108,613

ADHESIVE APPLYING MECHANISM

Filed June 22, 1936

4 Sheets-Sheet 1



Feb. 15, 1938.

E. G. RIDER

2,108,613

ADHESIVE APPLYING MECHANISM

Filed June 22, 1936

4 Sheets-Sheet 2

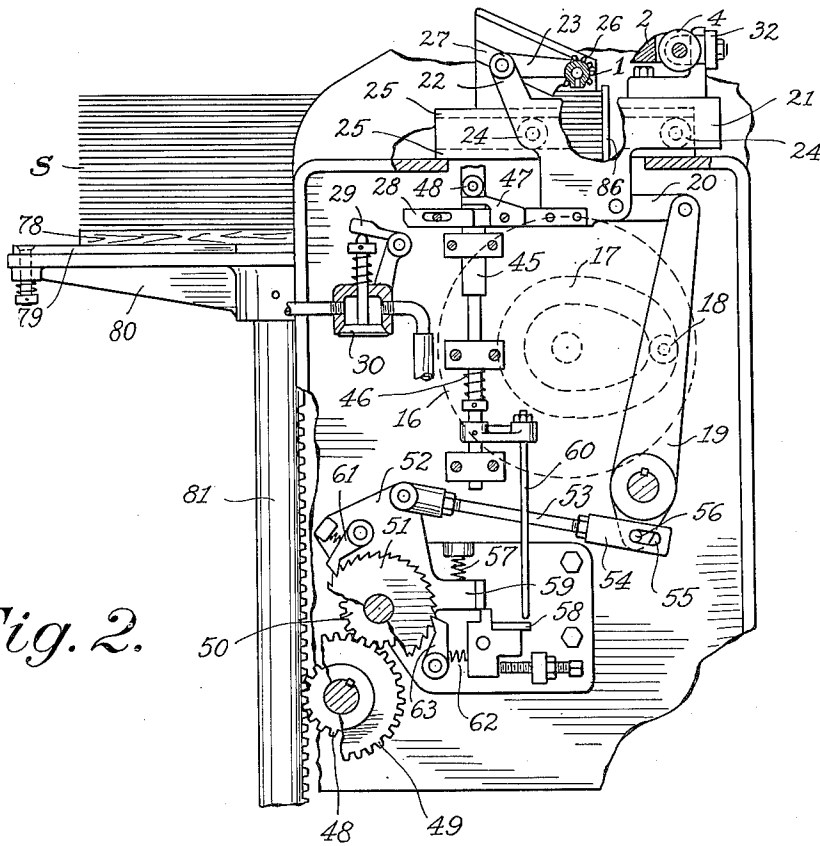


Fig. 2.

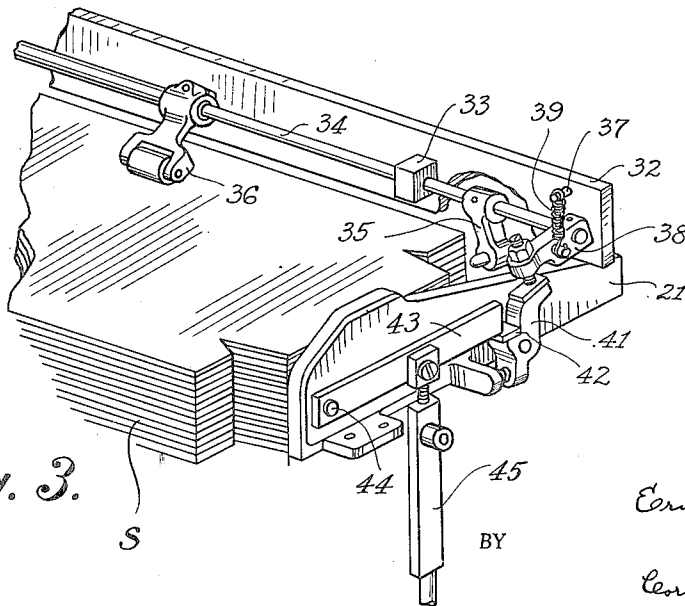


Fig. 3.

INVENTOR.
Ernest G. Rider

Cornelius L. Ehret
ATTORNEY.

Feb. 15, 1938.

E. G. RIDER

2,108,613

ADHESIVE APPLYING MECHANISM

Filed June 22, 1936

4 Sheets-Sheet 3

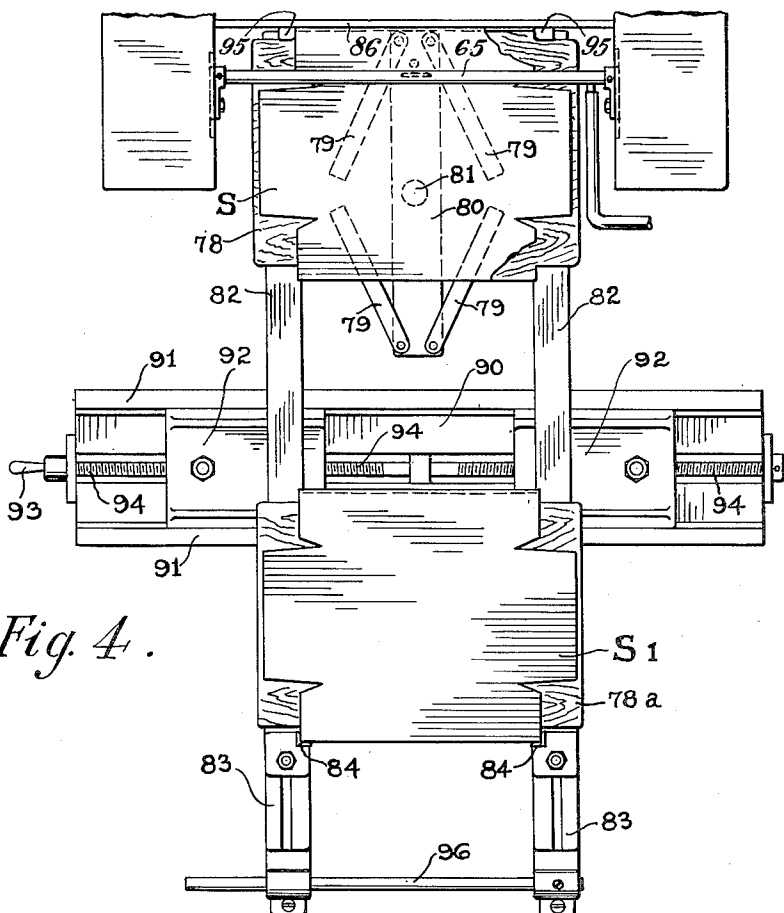


Fig. 4.

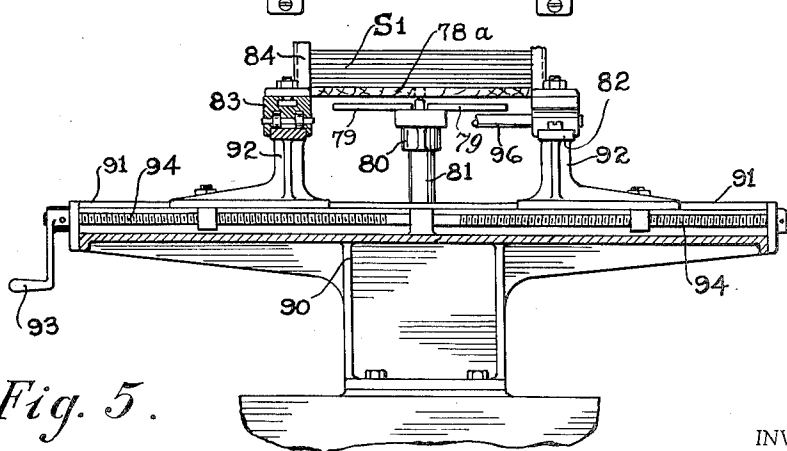


Fig. 5.

INVENTOR.

Ernest S. Rider

BY

Cornelius L. Ehret

ATTORNEY.

Feb. 15, 1938.

E. G. RIDER

2,108,613

ADHESIVE APPLYING MECHANISM

Filed June 22, 1936

4 Sheets-Sheet 4

Fig. 6.

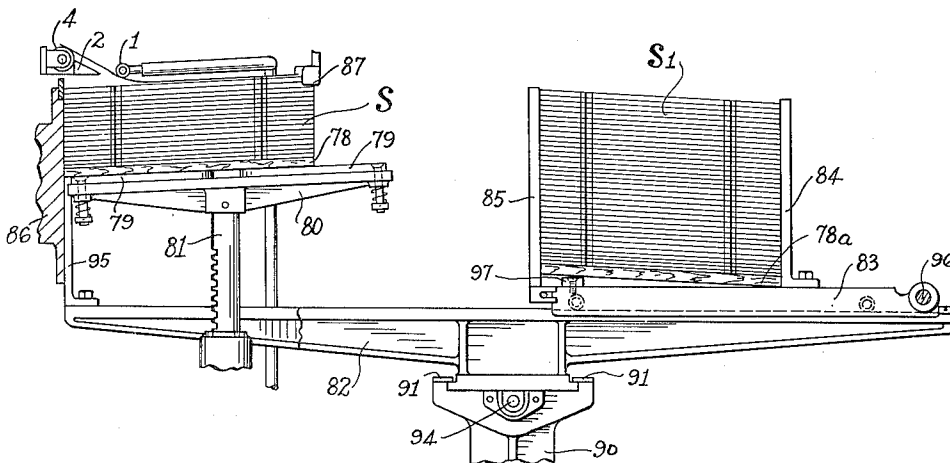
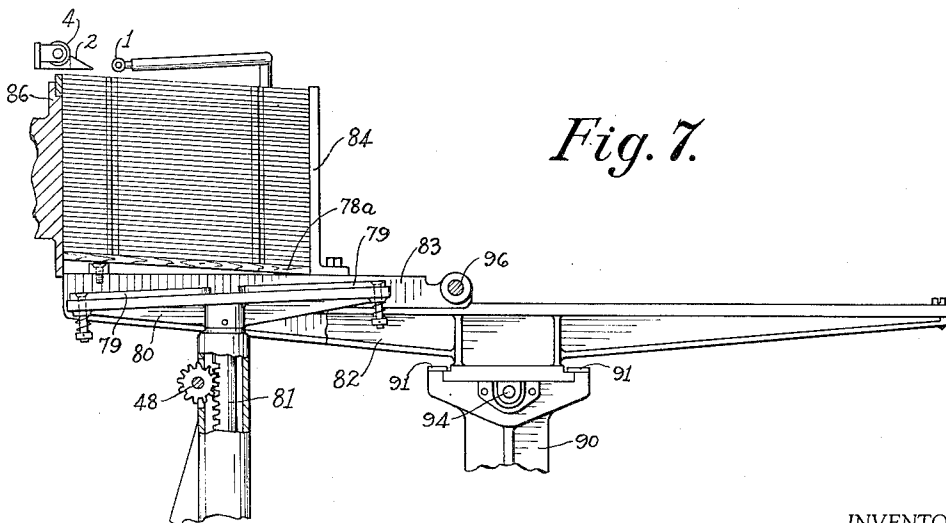


Fig. 7.



INVENTOR.

Ernest G. Rider

BY

Cornelius L. Ehret

ATTORNEY.

UNITED STATES PATENT OFFICE

2,108,613

ADHESIVE APPLYING MECHANISM

Ernest G. Rider, Philadelphia, Pa., assignor to
Stokes and Smith Company, Summerdale,
Philadelphia, Pa., a corporation of Pennsylv-
vania

Application June 22, 1936, Serial No. 86,604

11 Claims. (Cl. 271-62)

My invention relates to mechanism for applying adhesive to wrappers, labels, sheets or the like, and particularly to arrangements for supporting and feeding a stack of wrappers or labels.

5 In accordance with my invention, the plunger or equivalent which lifts the stack of sheets into operative relation with a sheet-removing device is adapted to rise between the rails of a trackway for a carriage structure which, during the depletion of one stack of sheets by the sheet-removing device, supports another stack of sheets ready for use and which, when the plunger is lowered, may be moved along the trackway to bring the second stack into position above the plunger.

15 More specifically, and in one modification of my invention, the sheets of the stack while on the carriage structure are inclined in one direction and, when lifted from the carriage by the plunger, are shifted to incline in another direction.

20 Preferably, in the two forms of my invention specifically disclosed, the carriage structure comprises two trucks, one for each rail, connected by a cross-member which insures movement of the trucks as a unit along the trackway, but which permits the trucks to be separated when the rails are moved toward or from each other to accommodate the arrangement for stacks of different widths; more specifically, the rails are adjustable toward and away from each other by a single operating member.

30 Further in accordance with my invention, the carriage structure is provided with guides which hold the edges of the sheets of the stack in alignment while on, and during movement with, the carriage; preferably, the guide members are mounted upon the trucks so that they move to proper position for different widths of wrappers concurrently with adjustment of the rails.

40 Also in accordance with my invention, guide members for the forward edges of the sheets in the stack are carried by the rails at the plunger-loading position of the carriage, so that, upon adjustment of the rails for different widths of sheets, the guide members are by the same adjustment moved to proper position.

50 Further, in accordance with my invention, there are provided guide members for the rear edge or rear corners of the stack which are out of the path of the stack while it is on the carriage, but which engage the stack when lifted by the plunger.

55 My invention also resides in the features of combination, construction and arrangement hereinafter described.

For an understanding of my invention, reference is to be had to the accompanying drawings in which:

Fig. 1 is a side elevational view, with parts broken away, and parts omitted, of a sheet-applying mechanism;

Fig. 2 is a side elevational view on enlarged scale with parts in section and parts broken away of stack-elevating mechanism for the machine of Fig. 1;

Fig. 3 is a perspective view of the control mechanism for the stack-elevating mechanism shown in Fig. 2;

Fig. 4 is a plan view of the re-loading arrangement shown in Fig. 1;

Fig. 5 is an end elevational view, partly in section, of Fig. 5;

Figs. 6 and 7 disclose a modification of the re-loading arrangement shown in Figs. 4 and 5.

The adhesive-applying mechanism G shown in Fig. 1 is generally similar to the mechanism disclosed in Rider Patents Nos. 1,806,181, 1,857,260 and Nitsch et al. Patent No. 1,684,741. Briefly, once for each cycle of operation of the mechanism G, a wrapper or sheet is removed from the pile or stack S by mechanism including the suction roll 1 and tongue 2 and brought into engagement with the feeding rolls 3, 4, which transport it to the adhesive-applying roll 5. To prevent the sheet from slipping back toward the pile after it has been raised therefrom by tongue 2, there is provided an apertured pipe 65 extending transversely of the top of the stack S through which suction provided by pump 99 is continuously exerted. The strippers 6 deflect the wrapper from the roll 5 onto the endless belt 7 of the conveyor C.

When tabbed wrappers are desired, the tabbing mechanism T, more fully described in the aforesaid Rider patents, is brought into operation. Briefly, tabs are severed by the knives 8 from the strips 9 of tabbing material, the tabs receiving an adhesive coating by their engagement with the roll 10 from which they are deflected by the strippers 11 onto the adhesive roller 5 where they meet the wrappers during application of adhesive thereto by roller 5. When unwrapped boxes are to be made from unstayed box blanks, the feed of the wrappers is disabled so that only tabs are fed to the conveyor C.

To prevent adherence of the wrappers or tabs to the take-off blades or strippers 6, there are disposed adjacent thereto the toothed wheels or disks 12 for holding the wrappers or tabs against the receiving end of the conveyor belt C. The

wheels 12, only one of which appears in Fig. 1, are essentially duplicates and are adjustably carried by the arms 13 rotatable with shaft 14 which is supported by brackets 15 secured to or otherwise integral with the throw-back frame, more fully disclosed in Federwitz Patent No. 1,741,412, for the nose 15C of conveyor C.

The mechanism for controlling the operation of suction roll 1 and tongue 2 and for automatically elevating the stack of sheets to maintain the top of the stack substantially always in the same position is shown in detail in Figs. 2 and 3.

The cam 16 which makes one revolution for each cycle of the machine is provided with a track 17 for engaging the cam follower 18 carried by the lever 19. The upper end of lever 19 is connected by link 20 to the carriage 21 upon which is mounted the tongue 2 and supporting bracket 22 to which is pivotally connected the arm 23 carrying the suction roll 1. The rolls 24, rotatable about shafts mounted on carriage 21, engage guide members 25 to provide for linear reciprocation of the carriage 21 as lever 19 is oscillated by cam 16.

The gear 26 fixed to the shaft supporting the suction roll 1 is in mesh with the inclined rack 27 so that, as the carriage 21 moves to the left, Fig. 2, the suction roll 1 is rotated in counterclockwise direction and concurrently lifted away from the top of the stack to lift the front edge of the top sheet of the stack.

As the carriage 21 continues its travel to the left, Fig. 2, the bar 28 secured to the carriage depresses the arm 29 to open the bleeder valve 30 which is interposed between the suction roll 1 and the suction pump 31 (Fig. 1). The separated sheet is thus relieved of suction and falls upon tongue 2. Continued movement of the carriage 21 to the left, Fig. 1, brings the forward edge of the sheet between the driving feed roll 3 and the idler feed roll 4 supported by carriage 21. The sheet is then fed to the adhesive-applying roll 5, as previously described, and the carriage 21 is returned by cam 16 to its initial position.

Upon the bar 32 (Fig. 3) of the carriage 21 are mounted bearings 33 for the shaft 34 to which is secured the arm 35 and the feeler or stack-contacting member 36. Secured at one end to the pin 37 on bar 32 and at its other end to arm 38 secured to shaft 34, is a spring 39 which biases shaft 34 for movement in clockwise direction. As the carriage approaches the limit of its travel to the left, (Fig. 3) the arm 35 engages the stationary guide plate 36 (Fig. 2) and rocks the feeler 36 toward engagement with the top of the stack S.

Pivotally mounted to a side of the machine (Fig. 3) is a lever 41 which may be rocked in clockwise direction by arm 38, as hereinafter described. The lever 41 is provided with a step 42 engaging the end of a lever 43 pivoted at 44 to the frame of the machine and which, intermediate its ends, is pivotally connected to the vertically movable bar 45.

So long as the stack is of proper height, the feeler 36 each time it is rocked, as above described, engages the top of the stack and arrests movement of arm 38 before lever 41 is engaged or moved by arm 38 sufficiently to release lever 43, thus maintaining the bar 45 in the position shown in Fig. 3. When, however, the stack height falls below the desired level, the lever 41 is actuated by arm 38, during each cycle of the machine, to release bar 45. Upon its release, the bar 45 is moved downwardly as by spring 46 to cause an

upward movement of the stack S, as hereinafter described. The bar 45 is reset in each cycle by the cam 47 which is carried by bar 28 movable with carriage 21 (Fig. 3) and which engages the roller 48 on bar 45.

The supporting plunger 81 for the stack S is provided with a rack in mesh with gear 48 secured to the same shaft as gear 49 which, in turn, is in mesh with gear 50 secured to the same shaft as ratchet wheel 51. The plate member 52 which carries the driving pawl 61 for ratchet wheel 51 is mounted co-axially with the ratchet wheel. One end of link 53 is pivotally connected to plate 52 and the other end is connected to member 54 having therein a slot 55 which receives a pin 56 at the lower end of lever 19. The length of the slot is such that when plate 52 is in the position shown, the pin 56, during oscillation of lever 19, does not engage the ends of the slot.

The plate 52 is held in the position shown in Fig. 2 against the bias of spring 57 by engagement of the latch member 58 with the extension 59 of plate 52.

When the stack S is not of proper height and bar 45 falls, as above described, the tripping member 60, movable with bar 45, engages and rocks the latch 58, permitting plate 52 to swing in clockwise direction and effect engagement between the end of the slot 55 and pin 56. When, therefore, lever 19 next moves in clockwise direction, its movement is transmitted through link 53, plate 52, pawl 61, ratchet wheel 51 and gears 48, 49 and 50 to effect elevation of the stack-supporting plunger 81.

The latch 58 is reset in each cycle by the spring 62 which may also serve as the biasing spring for the locking pawl 63 for the ratchet wheel 51. So long as the stack is not of sufficient height, the bar 45 falls in each cycle to trip latch 58 and cause an upward movement of plunger 81. Each time the stack attains proper height, the feeler 36 no longer causes bar 45 to fall and the stack-feeding operation is discontinued until the stack height again falls below the desired level.

When the adhesive-applying unit G is associated with a wrapping machine operating at high speed, producing, for example, substantially in excess of 20 boxes per minute, the stack of wrappers S is rapidly depleted. Inasmuch as the wrapping machine must be idle during the time required to replenish the supply of wrappers for the adhesive-applying unit, it is desirable that provision be made to allow a new stack of sheets to be put in place in the least possible time.

As shown in Figs. 1 and 4, the stack of wrappers S rests upon a removable board or plate 78 which, in turn, is supported by the bars 79 pivotally mounted upon the support 80 which is fastened to the upper end of the plunger 81.

When the stack is depleted, the board 78 is removed by an operator and the plunger 81 is lowered approximately to the dotted line position shown in Fig. 1. The two rail members 82, one on either side of the plunger 81, serve as a track for the two trucks 83 upon which rests the board 78a supporting another stack of sheets S1. The guide members 84, adjustably secured to the truck members and extending upwardly therefrom, embrace the rear corners of the stack of sheets properly to align the stack. At least one of the front corners of the stack may be engaged, if desired, as by removable guide member 85.

After the stack S has been depleted and the plunger 81 lowered to the aforesaid, plunger-loading position, the temporary guides 85 are removed

and then the trucks are pushed forward until the front edge of the stack engages the guide plate or member 86 of the gluing machine. Then the plunger 81 is raised to lift the board 78 from the trucks 83 and to bring the top corners of the stack into engagement with the guide members 87 carried by the bracket 88 adjustably secured to the supporting bar 89. The trucks 83 can then be returned to the position shown in Figs. 1 and 4 to receive another stack of sheets. Each of the guide members 87 forms a trihedral angle receiving a top corner of the rear of the stack.

As shown more clearly in Fig. 5, the two rails 82 are mounted upon a supporting member 90, provided with guides 91 for the slidable base members 92 of the rails 82. By turning of the handle 93 at the end of the threaded shaft 94, the two rail members 82 are simultaneously moved toward or away from each other and symmetrically with respect to the median line of the machine thus to accommodate the loading system for wrappers of different length. This adjustment concurrently changes the separation between the trucks 83, the distance between the stack guiding members 84 on the trucks, and the distance between the stack guiding members 95 attached to the forward ends of rails 82 to maintain alignment of the front edge of the stack during its upward feed by the plunger 81. Preferably, as shown, a bar 96 secured to one of the trucks 83, passes through the frame of the other truck so that they are movable as a unit toward and from the loading position above plunger 81 though separately movable toward, or away from, each other during rotation of handle 93.

With this arrangement, whenever the stack S is depleted, there is always ready another stack, properly aligned, for movement into loading position to be fed by the stack-elevating mechanism. Thus there is avoided need to discontinue operation of the box-wrapping machine while a stack of sheets is being put into position and manipulated to bring all the wrappers and labels of the stack into proper position; further, an operator, while one stack is being fed to the glue roll, is free to prepare an auxiliary stack for quick reloading. In the course of a day's run, it is necessary many times to replenish the stack of wrappers, and the time saved by the aforesaid construction is equal to the time during which a large number of boxes can be made.

In the modification shown in Figs. 6 and 7, each of the trucks 83 is provided with a block 97, or equivalent, near the forward end thereof to incline the board 78a. As shown, the front edge of each sheet of the stack is higher than the rear edge and this relation maintains when the trucks are moved to bring the stack above the support 80, Fig. 7, with the forward edges of the sheets against stationary stack guides 95 and guideplate 86.

The supporting member 80 is inclined in the opposite direction, its forward, or left edge, as viewed in Figs. 6 and 7, being substantially lower than its rear edge. Hence, as the stack is raised by member 80, the inclination of the sheets is changed from downward from the forward edge to upward from the forward edge. This change of inclination loosens the sheets in the stack and facilitates their subsequent removal, one at a time, by the roll 1 and tongue 2. With this modification, there is no need for the operator to shake or jostle the stack to loosen the sheets before placing the stack on the trucks 83. Fur-

thermore, the final inclination of the sheets is such that they tend to slide toward plate 86 which aligns their forward edges.

What I claim is:

1. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, means detachable from said plunger for holding a stack of sheets inclined in one direction from horizontal when free of said plunger, and a support movable with said plunger inclined in a direction different from said first direction to loosen the sheets.

2. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a trackway extending to the path of said plunger, structure for supporting a stack of sheets inclined in one direction from horizontal and movable along said trackway, and structure movable with said plunger for changing the inclination of said stack as it is raised by the plunger.

3. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a pair of rails, one on either side of the path of said plunger, carriage structure movable along said rails to transport a stack of sheets to loading position above said plunger, and means for adjusting said rails toward or from each other.

4. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a pair of rails, one on either side of the path of said plunger, a pair of trucks, one on each of said rails, a member bridging said trucks to support a stack of sheets for transport to loading position above said plunger, and means for concurrently adjusting said rails and said trucks toward or away from each other.

5. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a trackway extending to the path of said plunger, carriage structure movable along said trackway to transport a stack of sheets to loading position above said plunger, and guide means mounted on said carriage structure for maintaining alignment of the sheets of said stack.

6. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a pair of rails, one on either side of the path of said plunger, a pair of trucks, one on each of said rails, a member bridging said trucks to support a stack of sheets for transport to loading position above said plunger, stack guides individual to said trucks, and means for simultaneously adjusting said rails, said trucks and said guides toward or away from each other.

7. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a pair of rails, one on either side of the path of said plunger, means for supporting a stack of sheets movable along said rails to transport the stack of sheets to loading position above said plunger, guides for engaging opposite sides of the stack when in loading position carried by said rails, and means for adjusting said rails toward and from each other and for simultaneously adjusting said guides.

8. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism,

supporting structure above the stack, and stationary guide members carried by said supporting structure for engaging the rear corners of the top sheets of the stack when raised by said plunger for removal of said sheets by said mechanism.

5 9. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, a trackway extending to the path of said
10 plunger, structure movable along said trackway to transport a stack of sheets beneath said guides to loading position above said plunger, supporting means outside of the path of said movable stack-supporting structure, and stationary guide mem-
15 bers carried by said supporting means and positioned thereby above the path of the stack when moved with said stack-supporting structure along said trackway and adapted to engage the rear corners of the top sheets of the stack when it is
20 raised by said plunger for removal of said sheets by said mechanism.

25 10. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, stack guide structure adjacent the path of said plunger, a pair of rails, one on either

side of the path of said plunger, a pair of trucks, one on each of said rails, and a detachable member bridging said trucks to support a stack of sheets during forward movement of said trucks to position the stack above said plunger for
5 elevation thereby and with the front of the stack against said guide structure, said trucks being devoid of interconnecting structure which is beyond or in the path of said plunger when said
10 trucks are in said stack elevating position.

11. In apparatus comprising mechanism for removing sheets from a stack thereof, and a plunger for raising the stack adjacent said mechanism, stack guide structure adjacent the path of
15 said plunger, a pair of rails, one on either side of the path of said plunger, a pair of trucks, one on each of said rails, a detachable member for bridging said trucks to support a stack of sheets during forward movement of said trucks to po-
20 sition the stack above said plunger for elevation thereby and with the front of the stack against said guide structure, and structure for interconnecting said trucks disposed, for all positions of
25 said trucks, entirely to one side of the path of movement of said structure.

ERNEST G. RIDER.