Dec. 26, 1944. G. W. VON HOFE 2,365,665

MACHINE FOR SEALING BOXES

Filed Nov. 11, 1942 8 Sheets-Sheet 1

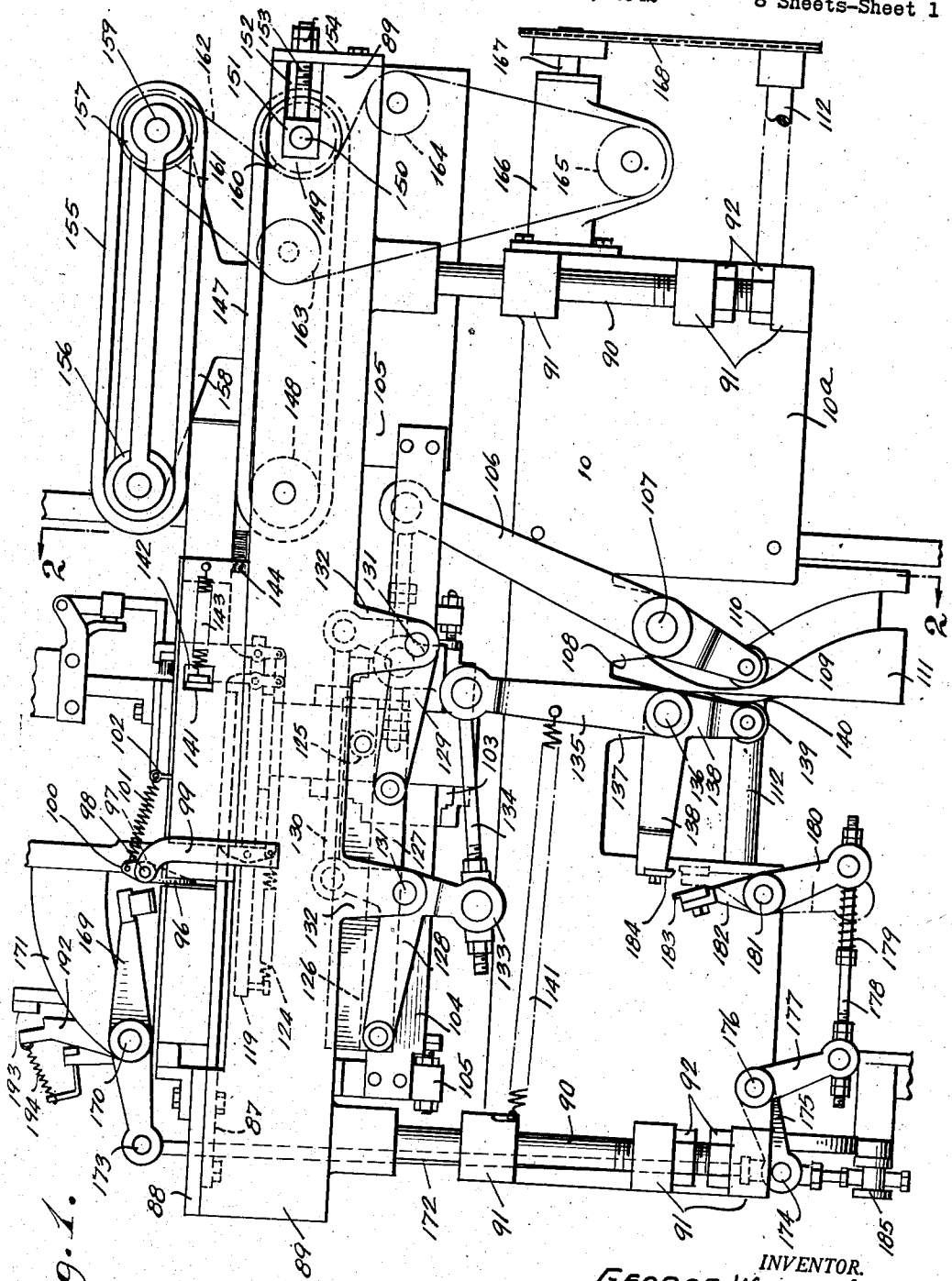


Fig. 1.

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MACHINE FOR SEALING BOXES

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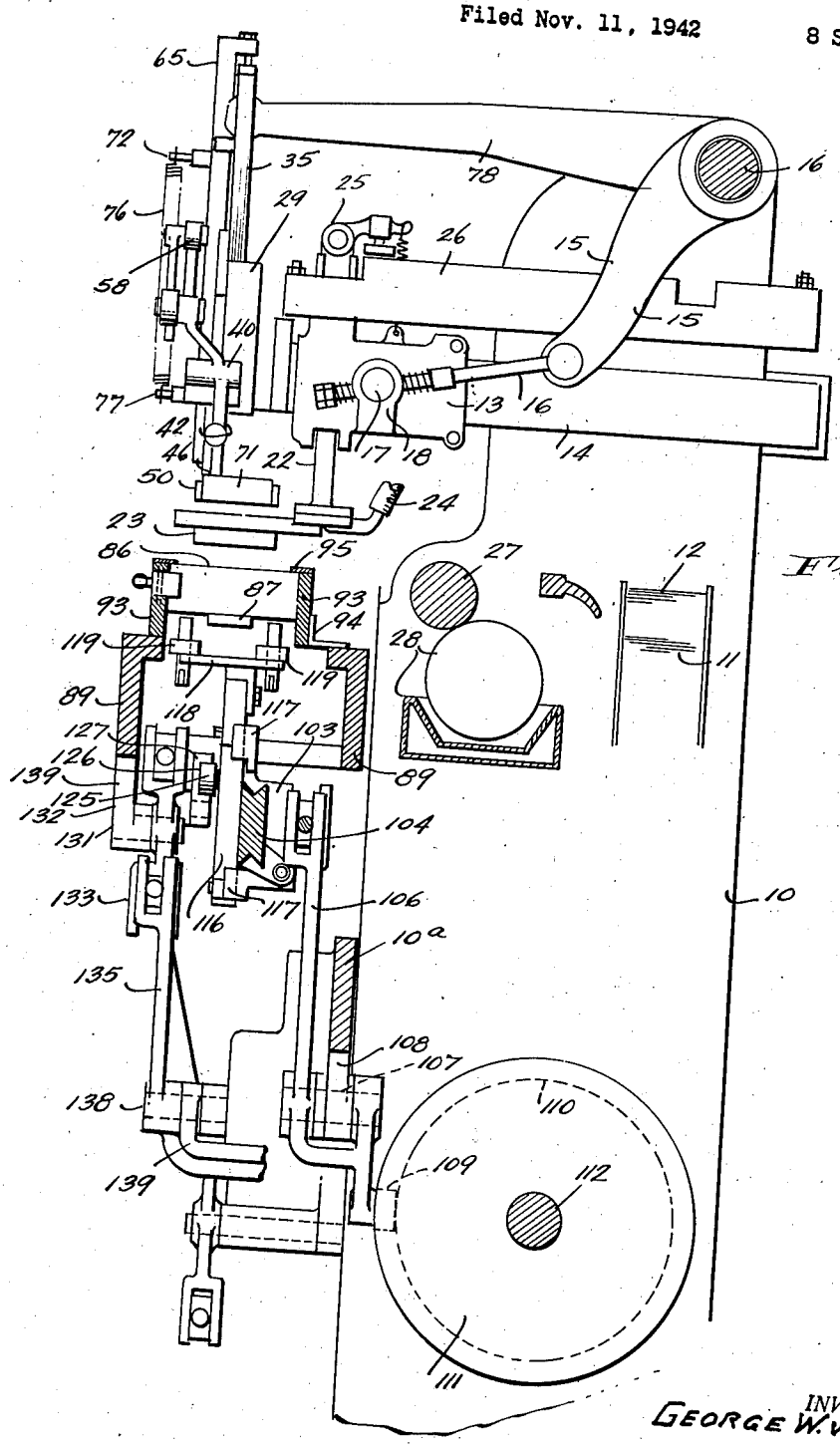


Fig. 2.

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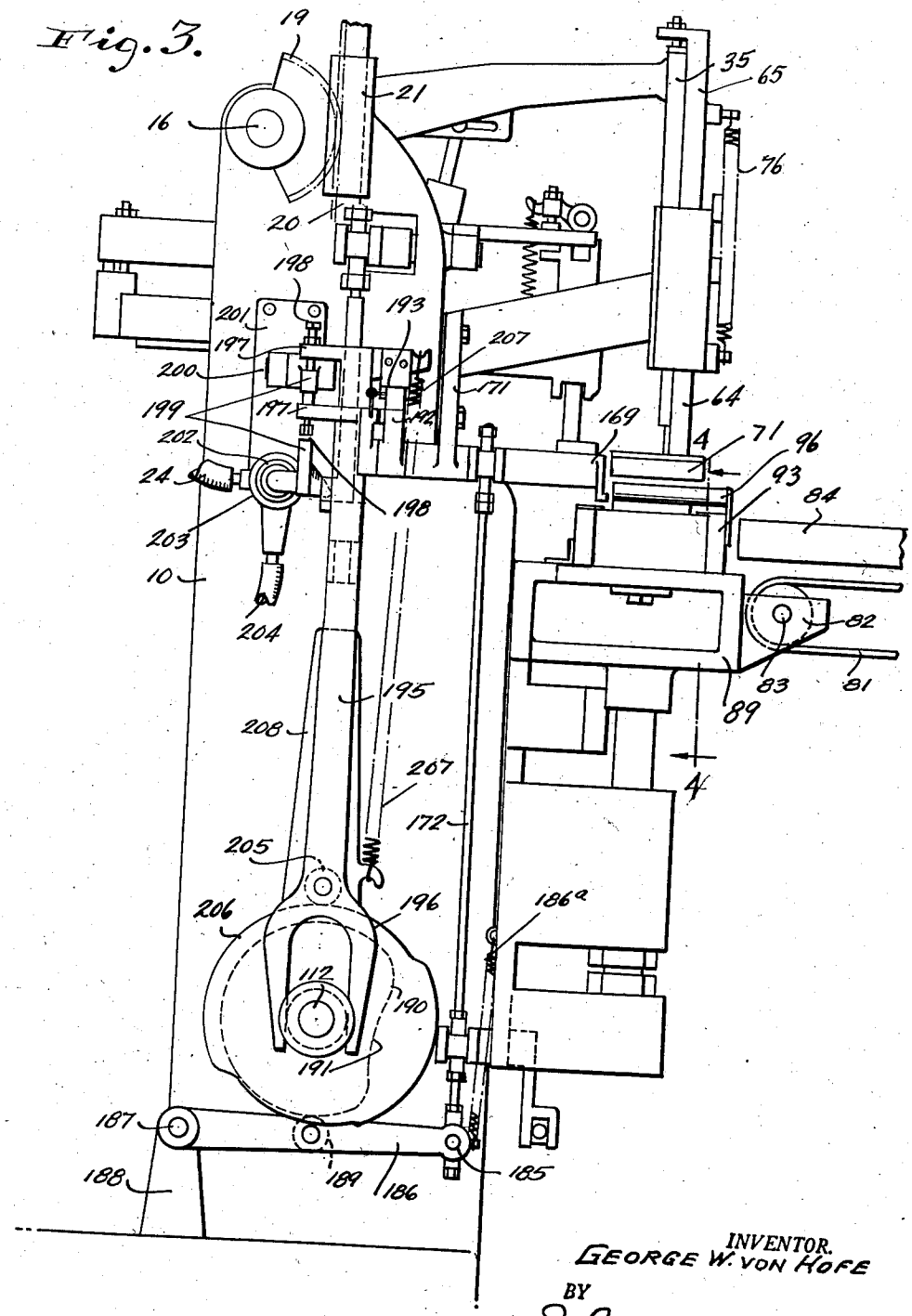
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MACHINE FOR SEALING BOXES

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Fig. 3.



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MACHINE FOR SEALING BOXES

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Fig. 4.

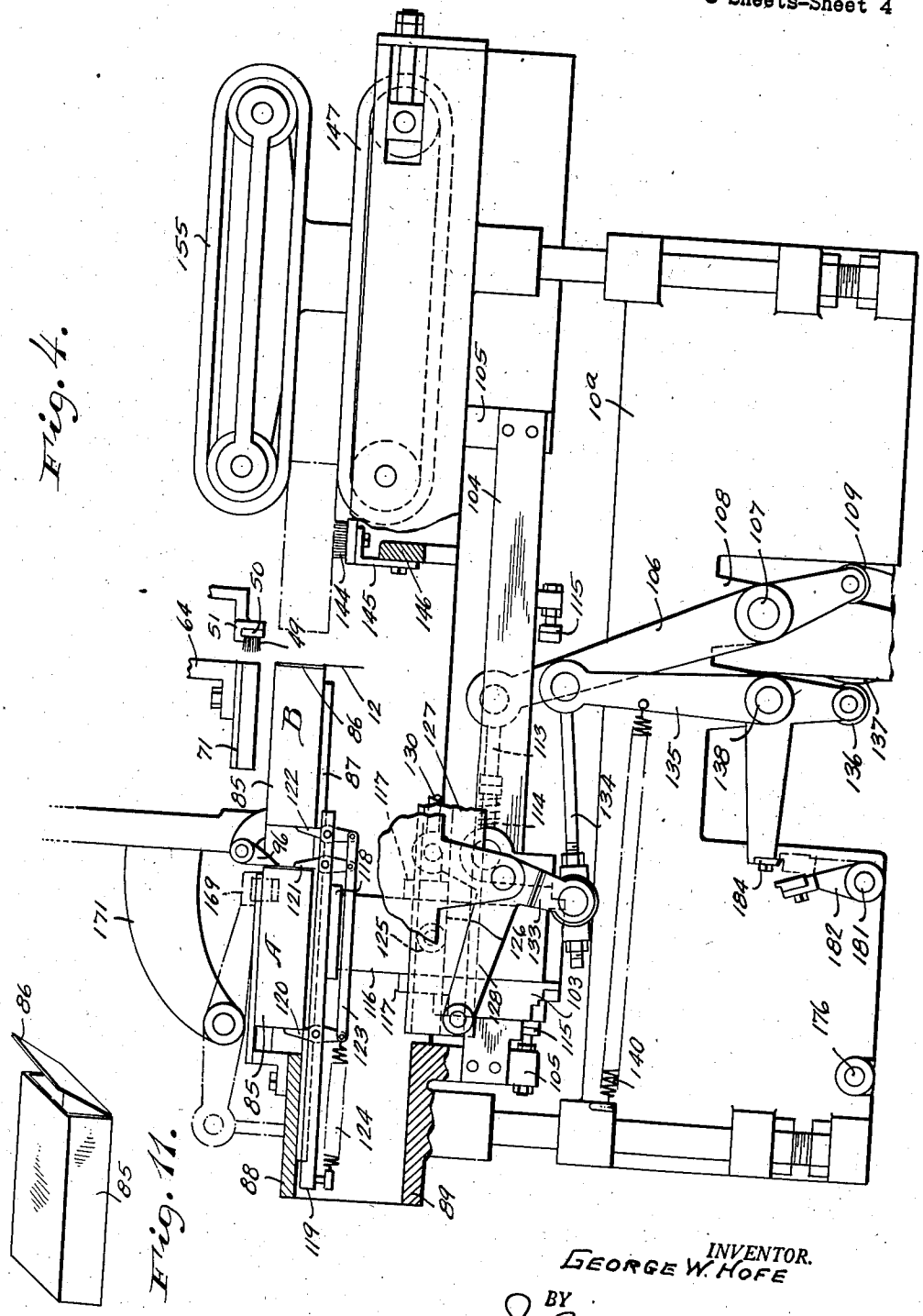


Fig. 11.

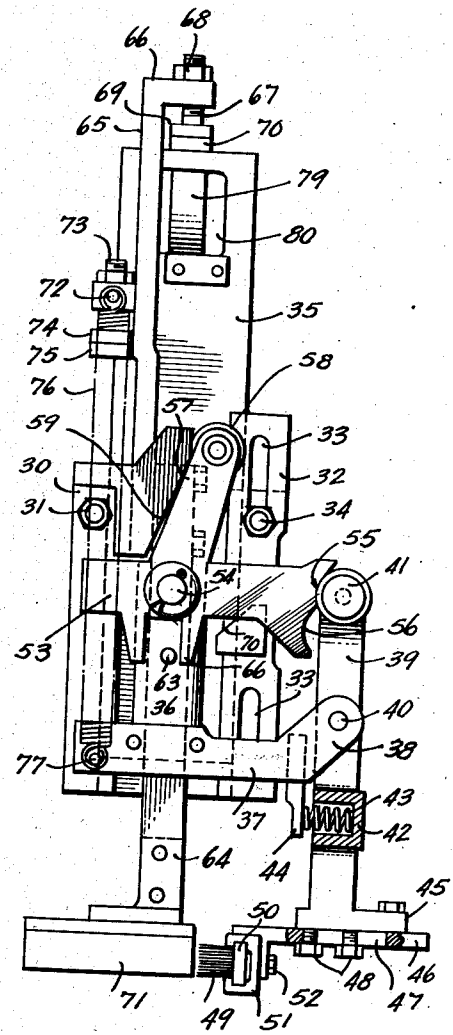
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MACHINE FOR SEALING BOXES

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Fig. 5.



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Fig. 12.

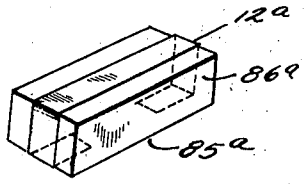


Fig. 10.

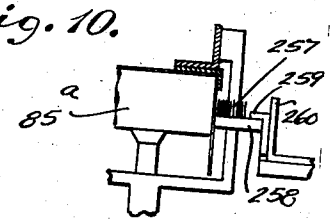
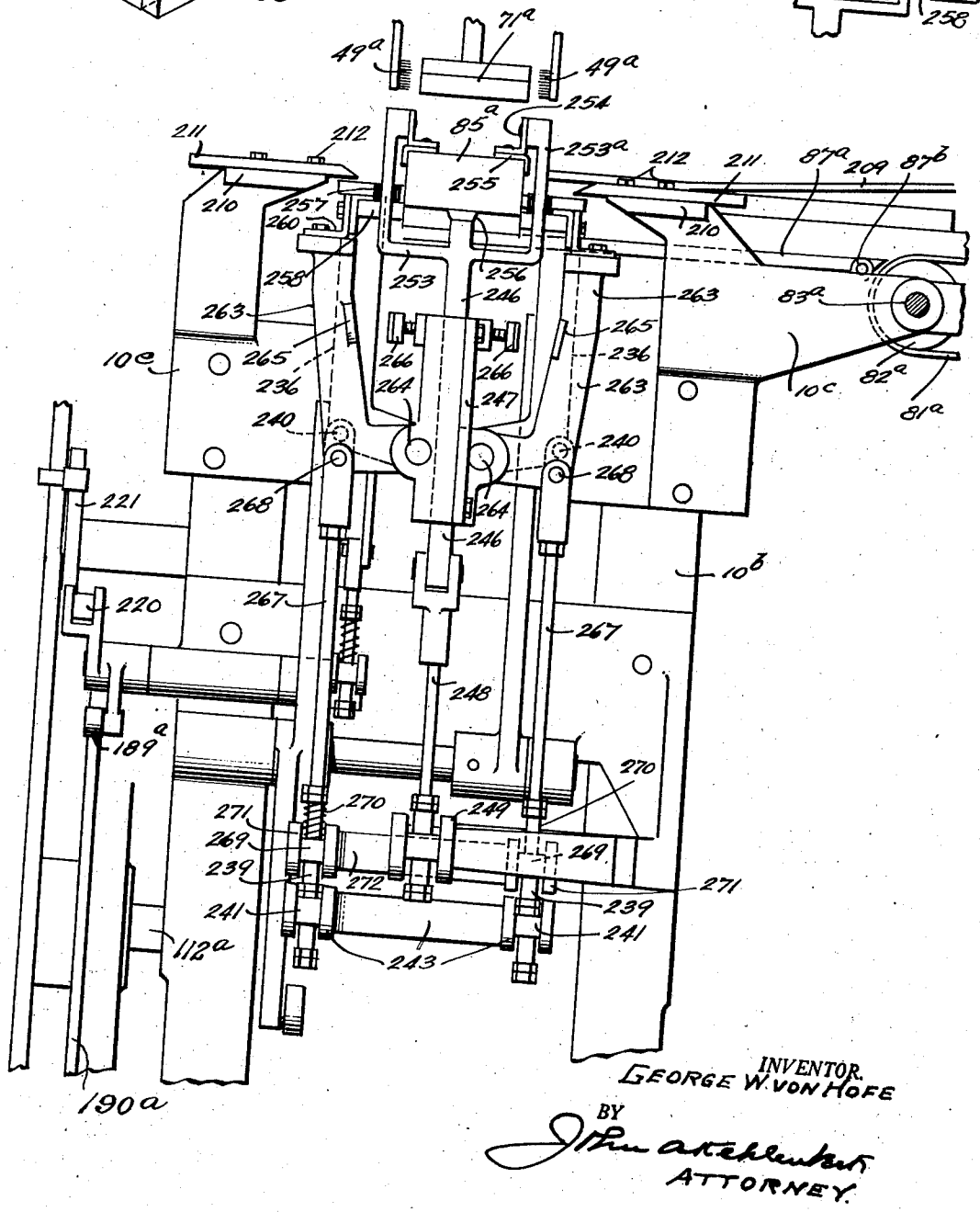


Fig. 6.



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MACHINE FOR SEALING BOXES

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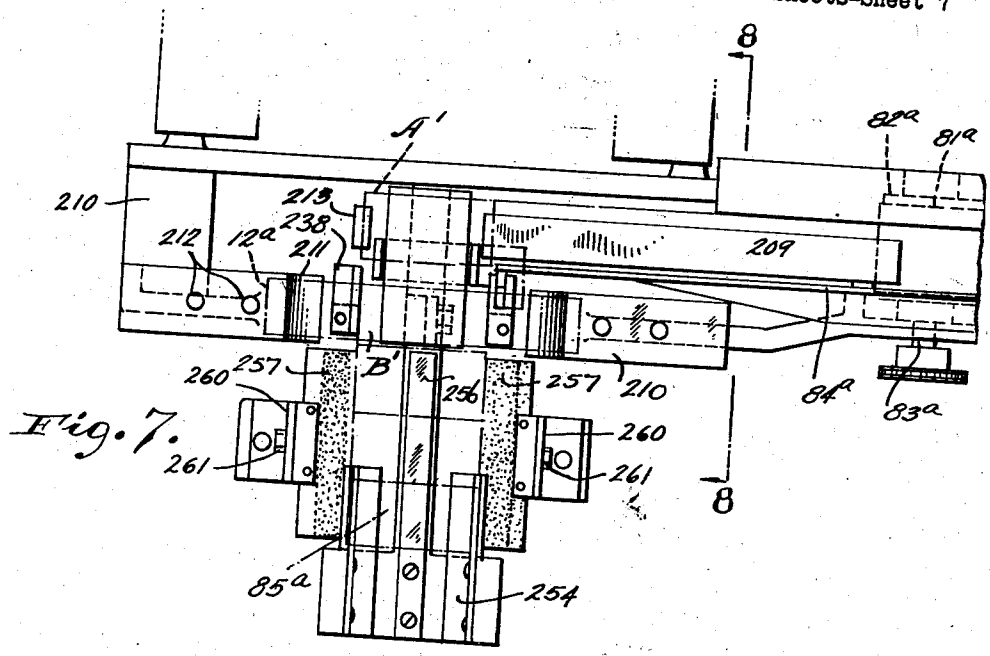


Fig. 7.

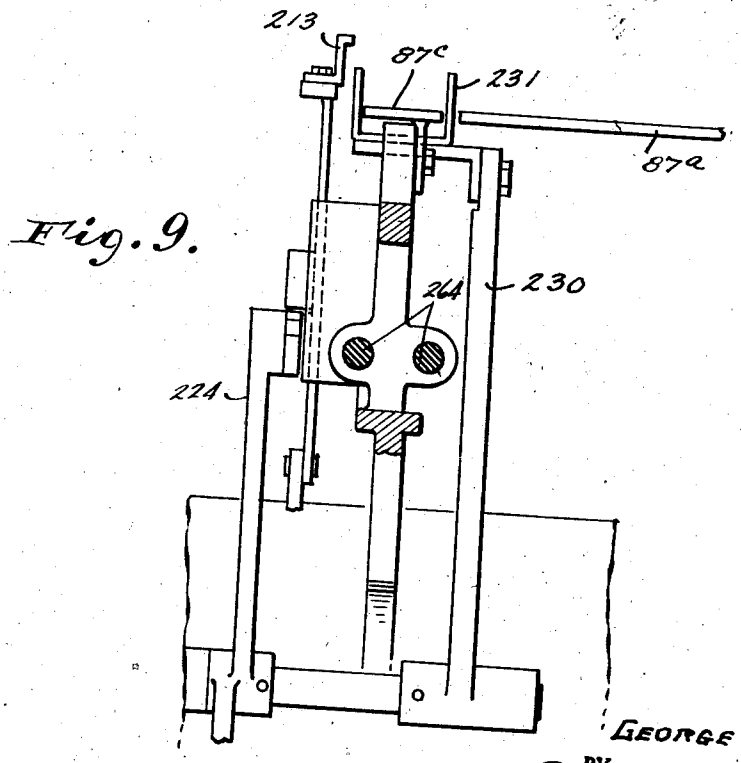


Fig. 9.

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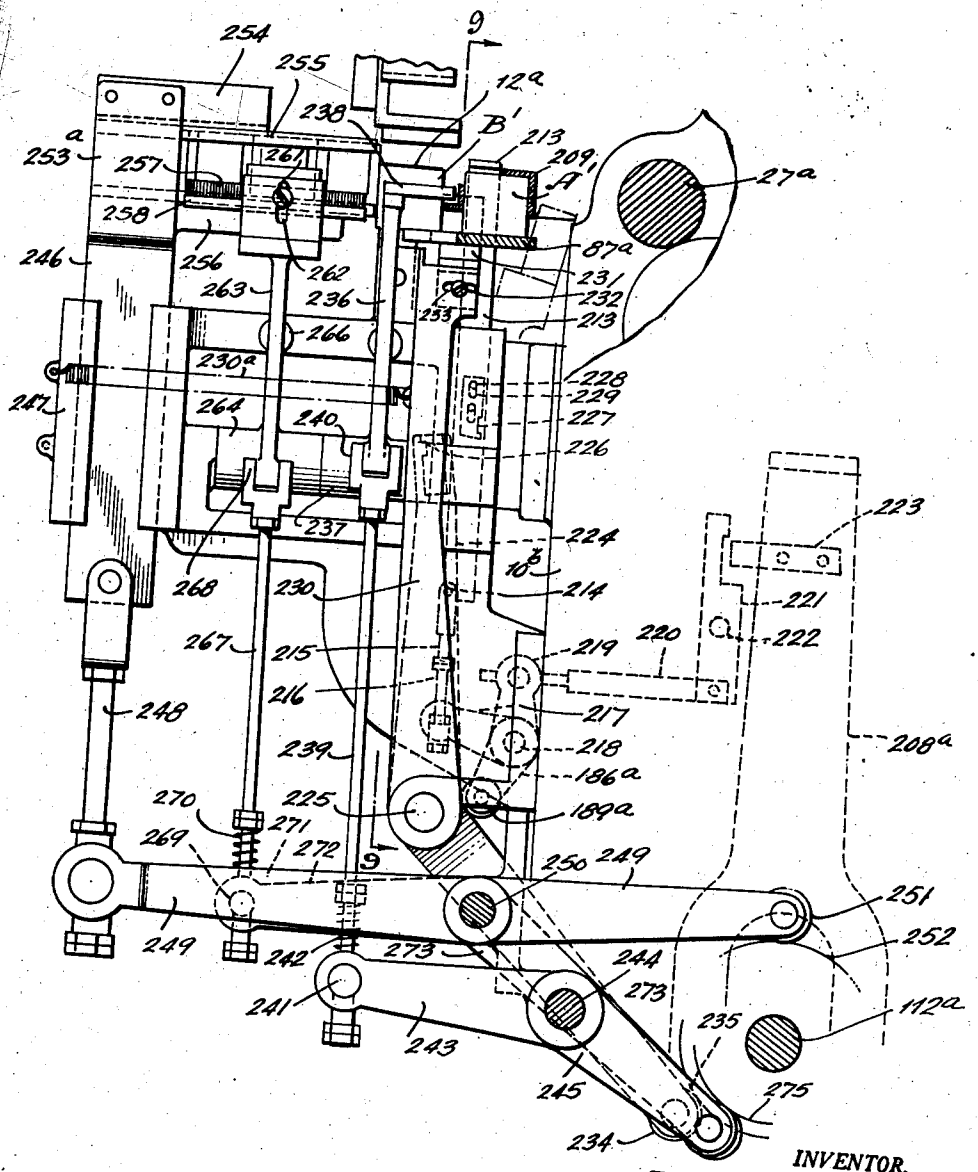
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MACHINE FOR SEALING BOXES

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Fig. 8.



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Patented Dec. 26, 1944 2,365,665

UNITED STATES PATENT OFFICE

2,365,665

MACHINE FOR SEALING BOXES

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Application November 11, 1942, Serial No. 465,269

19 Claims. (Cl. 216—55)

The invention relates to machines for sealing boxes and has for its object to provide a machine of novel and simple construction for applying a seal, for instance, in the form of a label or its equivalent to said boxes in a manner to secure the covers thereof in closed position and to prevent opening of the boxes without mutilating the seal.

The invention contemplates further the provision of a novel machine for sealing the hinged covers of boxes and more particularly the hinged covers of boxes designed to receive a predetermined number of cartridges and the like.

A further object of the invention is to provide a novel sealing machine whereby the telescopic covers of two-part boxes designed for instance to contain vaccines and other medicinal materials, are securely sealed in their closed positions in a manner to prevent unauthorized opening thereof without detection, and so as to require no particularly skilled supervision of the sealing operation.

Other objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawings, which illustrate examples of the invention without defining its limits,

Fig. 1 is a fragmentary front elevation of the novel machine;

Fig. 2 is a sectional elevation on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation of the machine;

Fig. 4 is a fragmentary section on the line 4—4 of Fig. 3;

Fig. 5 is a front elevation of the novel machine;

Fig. 6 is a front elevation of another form of the machine;

Fig. 7 is a plan view thereof;

Fig. 8 is a sectional elevation on the line 8—8 of Fig. 7;

Fig. 9 is a sectional view on the line 9—9 of Fig. 8;

Fig. 10 is a detail view of a portion of the applying mechanism, and

Figs. 11 and 12 are perspective views of several forms of boxes capable of being efficiently sealed by the novel machines and illustrating different types of sealing.

The box sealing machine in the form shown in Figs. 1–5 inclusive, includes an upright supporting frame 10 on which a suitable container or hopper 11 is mounted in position for proper cooperation with the associated elements of the machine; the container or hopper 11 contains a supply of sealing strips 12, which may comprise suitable labels, and in any case preferably are arranged in the form of an upright stack from the upper end of which the sealing strips or labels 12 are successively removed for application to the boxes which are to be sealed. Suitable provision is made, in any customary manner, for periodically restoring the upper end of the stack of sealing strips or labels 12 to a predetermined level in proper operative relation to the cooperating elements of the machine. As the elevating mechanism whereby this periodical adjustment is effected does not per se constitute a novel feature of the machine, and as such mechanism is well-known, it has not been deemed necessary to illustrate the same. For the purpose of controlling the aforesaid elevating mechanism, the machine may include any suitable means such as shown for instance in United States Patent No. 2,227,816 of January 7, 1941.

In the machine as illustrated, the means whereby individual sealing strips 12 are successively removed from the supply stack and transferred therefrom to the point of application to the elements to be labeled, is of the suction operated type, and per se may be of any suitable construction. As shown, the label transferring means consists of a carriage 13 slidably mounted upon a horizontal guide rail 14 supported on the frame 10 in any convenient manner. The carriage 13 is slidably reciprocated on the rail 14, for instance, by means of an arm 15 fixed upon a shaft 16 suitably journalled on the frame 10, said arm 15 having its free end pivotally connected with a coupling rod 16 which in turn is yieldingly and pivotally connected at 17 with a lug 18 forming part of or fixed upon the carriage 13 as shown in Fig. 2.

In the operation of the machine, the carriage 13 is reciprocated on the rail 14 by rocking the shaft 16, which swings the arm 15 to alternately push and pull the carriage 13 lengthwise of the rail 14. The mechanism whereby said shaft 16 is rocked may comprise a gear segment 19 fixed upon the shaft 16 and meshing with a rack 20 vertically movable in a guideway 21 suitably located upon the frame 10 as illustrated in Fig. 3. The rack 20 is vertically reciprocated to rock the segment 19 and shaft 16 in timed relationship with the other elements of the machine, in any conventional and well-known way.

The carriage 13 serves as a support for a member 22 which is vertically slidable on said carriage 13 and at its lower end carries a suction head 23. The specific construction of the latter may be of any conventional type, the suction head 23 in any case being connected with a source of suction, for instance, by means of a suitable tube 24. Throughout the major portion of the reciprocation of the carriage 13 the member 22 is held against downward vertical movement by means of a roller 25 which travels lengthwise of a fixed rail 26, the latter at predetermined points being recessed to permit downward vertical movement

of the member 22. This enables the suction-head 23 to remove terminal sealing strips or labels 12 from the upper end of the supply stack and effect the initial application thereof to the boxes to be sealed. The aforesaid vertical movements of the member 22 and its associated elements on the carriage 13 may be effected by means of any suitable mechanism such as shown, for instance, in Patent No. 2,227,816 previously mentioned herein.

In the box sealing machine illustrated in Figs. 1–6 inclusive, the sealing strips or labels 12 picked up successively by the suction-head 23 from the supply stack are provided with a coating of adhesive on one surface during the transfer of said sealing strips or labels 12 from the supply stack to the point of application to the boxes which are to be sealed. For this purpose each sealing strip or label 12 subsequent to its removal from the supply stack by the suction-head 23 is carried into progressive tangential contact with the adhesive applying roll 27 of the adhesive applying means 28 suitably mounted in proper position in the machine as shown in Fig. 2. The adhesive applying means 28 may be of any suitable construction and needs no further description as per se it does not constitute a novel feature of the instant machine.

The apparatus for applying the sealing strips or labels 12 to the boxes to be sealed comprises a main guide member 29 secured in an upright position on a supporting bracket suitably mounted upon or forming part of the machine frame 10. A gib plate 30 is fixed in place on the guide member 29 in any convenient manner as by means of screws 31, and a second gib plate 32 is provided with slots 33 for the accommodation of screws 34 whereby said gib plate 32 is adjustably mounted on said main guide member 29. The latter in conjunction with the inwardly projecting portions of the gib plates 30 and 32 provides a vertical guideway in which a main slide 35 is slidably mounted for movement in vertical directions.

An auxiliary channeled guide member 36 is suitably fastened upon the face of the main slide 35 to move therewith and forms part of or is secured to a bracket 37 which includes a forked bearing 38 projecting at an upward inclination from the bracket 37 as shown in Fig. 5.

The bearing 38 provides a support for a wiping device illustrated in the form of a lever 39 which is pivotally connected therewith at 40 and at its upper end carries a roller 41 the purpose of which will appear more fully hereinafter. At an intermediate point the lever 39 is provided with a socket 42 for the accommodation of a coil spring 43 which bears with its outer end against an abutment member 44 projecting downwardly from the bearing 38 preferably as an integral part thereof as shown in Fig. 5. At its lower end the lever 39 is formed with a transversely extending head 45 on which a holder 46 for a wiping element or equivalent applying means is adjustably mounted. As shown in the illustrated example the holder 46 is located in surface engagement with the head 45 and is provided with a slot 47 for the accommodation of screws 48 whereby said holder 46 is fixed in adjusted position on said head 45.

In the illustrated example, the wiping element comprises a brush 49, the back 50 of which is adjustably mounted in a grooved support 51 forming part of or secured to the holder 46, one or more set screws 52 being provided for clamping the brush back 50 against movement in the support 51. With the arrangement as shown and described, the brush 49 extends transversely to the holder 46 and may be adjusted to different positions by shifting the holder 46 relatively to the head 45 and furthermore may be adjusted in directions at right angles to the aforesaid adjustment by shifting the brush back 50 in the support 51. It is accordingly easily possible to adjust and set the brush 49 or equivalent applying means in any desired manner relatively to the boxes being sealed.

The apparatus, in addition to the parts so far mentioned, includes control means whereby the wiping device is controlled, or more specifically, whereby the brush lever 39 is rocked on the pivot 40 to shift the brush 49 from an operative position to an inoperative position and vice versa during an operative cycle of the machine. The aforesaid means is illustrated in the form of a control device comprising a rocking lever 53 pivotally mounted on a stud 54 carried by the auxiliary guide member 36. At its outer end the lever 53 is provided with recesses 55 and 56 for the reception of the roller 41 of the lever 39. The arrangement is such that the recess 55 is located at a somewhat greater distance from the pivot 54 of the lever 53 than the recess 56 for the purpose to be more fully set forth hereinafter. The control device further comprises an arm 57 preferably constituting an integral part of the lever 53 and extending upwardly therefrom in an oblique direction as illustrated in Fig. 5. At its upper end the arm 57 is provided with a roller 58 arranged to engage and co-operate with stationary cams 59 and 60 respectively, during the vertical movements of the main slide 35 in on operative cycle of the machine. The cam 59 in the example shown, is carried by and forms part of the gib plate 30 and the cam 60 projects from and comprises an integral part of the gib plate 32 and is selectively adjustable therewith to different set positions relatively to the cam 59. To definitely arrest the rocking movements of the control device, the rocking lever 53 may include depending stop lugs 61 and 62 suitably spaced apart and co-operating with a stop pin 63 projecting outwardly from the auxiliary guide member 36 into the rocking paths of said lugs 61 and 62 as shown in Fig. 5.

In addition to the parts so far mentioned, the apparatus includes pressure means whereby the sealing strips or labels 12 are initially applied to the boxes to be sealed and held in place thereon while the application of the sealing strips or labels 12 to said boxes is continued, as will be clearly set forth hereinafter. In its illustrated form the pressure means consists of a pressure plunger 64 slidably guided in the auxiliary guide member 36 and suitably connected with an auxiliary pressure slide 65. At its upper end the latter is formed with a transverse lug 66 projecting over the upper end of the main slide 35 into registry therewith and carrying an adjustable stop in the form of a screw 67 in threaded engagement with said lug 66 and fixed in an adjusted position thereon by a lock nut 68. The screw 67 is provided at its lower end with a head 69, the free surface of which is preferably covered with a resilient stop pad 70 as illustrated in Figs. 2 and 5. At its lower end the pressure plunger 64 carries a pressure member 71 suitable for the particular type of box sealing operation being performed. A lug 72 projects outwardly from the auxiliary pressure slide 65 at an intermediate

point for the accommodation of an adjustable stop screw 73 in threaded engagement with said lug 72 and provided at its lower end with a head 74 having a resilient stop pad 75 secured on its free surface adapted to engage the upper end of the gib plate 30 for the purpose to be described further on in the description. The auxiliary pressure slide 65 and the pressure plunger 64 with their associated parts are yieldingly connected with the main slide 35 by means of a coupling spring 76 having its one end connected with a pin projecting from the lug 72 and its other end attached to a pin 77 extending outwardly from the bracket 37.

For the purpose of operating the aforesaid apparatus, the machine includes a lever 78 loosely mounted on the shaft 16 and provided with a rounded front end 79 projecting into a slot 80 located at the upper end of the main slide 35, as illustrated in Fig. 5. Any suitable mechanism may be provided in the machine for rocking the lever 78 on the shaft 16 to vertically reciprocate the main slide 35 and its associated elements in the intended manner. In the illustrated example, the aforesaid mechanism may be of the same type and operate in the same way as shown in Patent No. 2,227,816 referred to hereinbefore.

For the purpose of delivering the boxes to be sealed, to the mechanism for applying the sealing strips or labels 12, the machine includes an endless conveyor 81, the upper run of which travels in a direction toward said mechanism. The conveyor 81 passes over rollers or pulleys 82 and is operated in any convenient manner, for instance by operatively connecting the shaft 83 on which one roller or pulley 82 is fixed, with a suitable source of power such as an electric motor. Guide members or rails 84 extend lengthwise of the upper run of the conveyor 81 in operative relation to and lengthwise of the opposite longitudinal edges of said conveyor 81. The guide members 84 are mounted in any suitable manner, preferably so as to be adjustable in parallelism toward and away from each other for the accommodation of boxes 85 of different dimensions.

The novel machine, in the form shown in Figs. 1 and 5 inclusive, is particularly efficient in sealing boxes 85 of the type shown in Fig. 11 which include a hinged closing flap or cover 86 for closing one end thereof. It is to be understood however that the machine, in the form under discussion is not arbitrarily restricted to boxes 85 such as illustrated in Fig. 11.

In practice boxes such as the box 85, are placed upon the upper run of the conveyor 81 with the hinged edges of the closing flaps 86 resting upon the same, so that said flaps or covers 86 project upwardly from the conveyor 81 and normally would tend to pivotally drop to an open position. To prevent this and to maintain said flaps or covers 86 in closed position, the guide members or rails 84 are adjusted to a spaced parallel relation in which the closed ends of said boxes 85 are in slidable surface contact with one of said guide rails 84, while the closing flaps or covers 86 in their closed positions are in corresponding slidable surface engagement with the other guide rail 84. Because of this arrangement, the covers 86 will be maintained in said closed position by the one guide rail 84 as said boxes 85 are progressively advanced by the conveyor 81 toward the mechanism for applying the sealing strips or labels 12 thereto.

The delivery end of the conveyor 81 is located in delivery relation to a box supporting member 87 mounted in transverse relation to said conveyor 81 on a plate 88 carried by beams 89 spaced apart in parallel relation and extending transversely across the front of the machine as shown in Fig. 1. The beams 89 and their associated elements preferably are vertically adjustable as a unit and accordingly may be connected by transverse webs and thereby mounted on vertical rods 90 slidable in bearings 91 located on a plate 10a associated with the beams 89. Any suitable means may be provided for slidably shifting the rods 90 in the bearings 91 to effect the vertical adjustment of the beam 89. For instance, the rods 90 may be threaded for the accommodation of nuts 92 which in co-operation with the adjacent bearings 91 may serve to accomplish said vertical adjustment. The supporting member 87 is located midway between two guide members 93 mounted on the beams 89 in any convenient manner in spaced parallel relation as shown in Fig. 2, and spaced apart in a manner to slidably accommodate the boxes 85 as illustrated in Fig. 2. To provide for the accommodations of boxes 85 of different dimensions one of guide members 93 may be carried by brackets 94 adjustably attached to the contiguous beam 89 in a manner to enable the one guide member 93 to be shifted toward and away from its associate member 93. If desired, both guide members 93 may be adjustably mounted on the respective beams 89. Flanges 95 may be fixed on the upper edges of the members 93 so as to project inwardly beyond the same for maintaining the boxes 85 in place between said members 93.

After a box 85 has been delivered to the supporting member 87, it is located beyond the guide rails 84 neither of which at this stage accordingly functions to maintain the cover or flap 86 of said box in its closed position. The machine therefore is provided with convenient means whereby this function is performed in the aforesaid delivered position of said box 85.

In its illustrated form the means comprises a flap member 96 projecting radially from a sleeve 97 pivotally mounted on a pin 98 supported on an upright bracket 99 secured to one of the beams 89 as shown in Fig. 1. The sleeve 97 carries a lug 100 to which one end of a spring 101 is fastened, the other end of said spring being connected with a pin 102 or the like, fixed on one of the guide members 93. The flap member 96 is so arranged that it will engage the closing flap 86 of the box 85 as the latter is transferred to supporting member 87. This arrangement is such that the flap member 96 in co-operation with the one guide rail 84 prevents the cover flap 86 of the box 85 from materially shifting from its closed position during the transfer of a box 85 to the supporting member 87.

The machine further includes shifting means whereby a box 85 is shifted lengthwise of the supporting member 87 from its initial position thereon to a position in which a sealing strip or label 12 is deposited thereon and partially applied thereto.

In its illustrated form, the shifting means comprises a carrier 103 slidably mounted on a rail 104 suitably supported in place in the machine by brackets 105 as shown in Figs. 1 and 4. During an operative period the carrier 103 is reciprocated on the rail 104 in any convenient manner, as for instance by means of a lever 106 pivoted at 107 on a lug 108 forming part of the plate 10a. The lever 106 at its lower end, is provided with a roller 109 projecting into the cam groove 110

of a barrel cam 111 fixed upon a power shaft 112. The upper end of said lever 106 is connected by means of a coupling rod 113 with the carrier 103, the latter connection being rendered resilient by means of a spring 114. The reciprocation of the carrier 103 is arrested by means of preferably adjustable stops 115 suitably supported in the path of the carrier 103 at opposite ends of said path.

The shifting means under discussion further includes a slide 116 mounted on the carrier 103 for vertical reciprocation in guides 117 located thereon. At its upper end the slide 116 carries a cross-bar 118 which in turn supports two horizontal members 119 in spaced parallel relation with each other and with the supporting member 87 upon opposite sides of the latter as shown in Fig. 2. The members 119 are each provided with fingers 120, 121 and 122 pivotally mounted on said members 119 and connected to pivotally rock in unison, by means of links 123. Springs 124 serve to permit said fingers 120, 121 and 122 to pivotally yield if the operation of the associated mechanism is interrupted, to thereby prevent injury to said fingers and associated mechanism as a result of such interruption. Suitable provision is made to arrest the fingers 120, 121 and 122 in their upright operative positions without interference with the aforesaid yielding movements of said fingers 120, 121 and 122. For instance, the fingers 120 may include stops which co-operate with the members 119 to arrest said fingers 120 and with them the fingers 121 and 122 in their upright operative positions.

Any suitable mechanism may be included in the machine for effecting the vertical reciprocation of the slide 116 and with it the members 119 and fingers 120, 121 and 122 relatively to the carrier 103 and in proper timing with the associated elements of the machine.

For instance, a roller 125 may be mounted upon one face of the slide 116 in perpendicular relation thereto for travel lengthwise of a groove 126 formed in and extending longitudinally of a raising and lowering rail 127. The latter is supported upon bell-crank levers 128 and 129 connected with each other by a connecting rod 130 and pivotally mounted at 131 upon lugs 132 depending from the one beam 89 as illustrated in Figs. 1, 2 and 4. The bell-crank lever 128 includes an additional arm 133 coupled by means of a rod or link 134 with one end of a rocking lever 135, fixed upon a shaft 136 supported upon a lug 137 and also carrying a bell-crank lever 138. The latter carries a roller 139 in rolling contact with an end face of the barrel cam 111 in the path of cam-noses 140 formed thereon at predetermined spaced points, and is maintained in proper engagement with the face of said cam 111 by means of a spring 141 effective upon the rocking lever 135.

As a box 85 is shifted along the supporting member 87 from its initial position thereon into a second position in co-operative relation with the means for initially applying a sealing strip or label 12, the flap member 96 will yield and permit the boxes 85 to pass along to said second position. As the applying position is reached, the closing flap 86 of said box 85 will engage a second flap member 141 pivotally mounted in an opening 142 provided in one of the guide members 93 and controlled by a spring 143. The aforesaid second flap member 141 will maintain the closing flap 86 of the box 85 in its closed position as the initial application of a sealing strip or label 12 takes place.

At a point beyond the above mentioned applying position a horizontal brush 144 or equivalent applying device is carried by a bracket 145 mounted upon a cross-bar 146 between the beams 89 preferably so as to be vertically adjustable.

In passing along in the machine after the application of a sealing strip or label 12 to a box 85, the latter is subjected to the action of a pressure means whereby a supplemental pressure is developed to firmly fix the applied sealing strip or label 12 in place on the box 85 and whereby the latter is fed along for removal from the machine.

As shown in Fig. 4, the pressure means comprises an endless lower belt 147 having its upper run at approximately the same level as the supporting member 87, and in longitudinal registry therewith. The belt 147 passes over pulleys 148 and 149, of which the former may be an idler rotatably mounted between the beams 89. To provide for the operation and adjustment of the belt 147, the pulley 149 is fixed on a shaft 150 journalled in bearing boxes 151 slidably mounted in slots 152 formed in the beams 89 as illustrated in Figs. 1 and 4. The boxes 151 are adjustable in the slots 152 in any convenient manner as by means of threaded stems 153 passing through plates 154 fixed at the outer ends of the slots 152, and co-operating nuts 154.

The pressure means under discussion further comprises an endless upper belt 155 the lower run of which is located above and in spaced parallel registry with the upper run of the lower belt 147, as shown in Figs. 1 and 4. The upper belt 155 passes over pulleys 156 and 157 rotatably mounted on a suitably supported bracket 158 with the pulley 157 preferably fixed upon a shaft 159 to rotate therewith. In the preferred arrangement the bracket 158 is vertically adjustable to enable the distance between the upper and lower runs of the respective belts 147 and 155 to be selectively varied as may be required by boxes of different dimensions.

For the purpose of actuating the two belts 147 and 155, the shafts 150 and 159 may be provided respectively with sprocket wheels 160 and 161 operated by a sprocket chain 162 which passes over idler sprocket wheels 163 and 164 and is connected with the sprocket wheel 165 of suitable gearing contained in a gear case 166. The driving shaft 167 of said gearing may be connected by a sprocket chain and sprocket wheels 168 with the power shaft 112, which may be operated in any convenient manner.

In addition to the parts so far described, the machine includes indexing means whereby the operation of the mechanism is controlled in dependence upon the delivery or non-delivery of a box 85 to the box supporting member 87 by the conveyor 81.

As shown in the illustrated example, the indexing means comprises an indexing member 169 carried by an indexing shaft 170 rotatably supported upon a stationary bracket 171 and having its one end in registry with the position on the supporting member 87 occupied by successive boxes 85 subsequently to their delivery thereto by said conveyor 81. A connecting rod 172 is pivotally connected at 173 with the other end of the indexing member 169, and in addition is pivotally connected at 174 with an arm 175 fixed upon a stub shaft 176 suitably journalled in the plate 10ª as shown in Fig. 1. A second arm 177 is carried by the shaft 176 and is yieldingly coupled by means of a rod 178 and a spring 179 with an arm 180. The latter is se-

cured upon a shaft 181 rotatably supported by the plate 10a and provided with an upright member 182 having a locking detent 183 movable beneath and into the path of an associate detent 184 carried by the bell-crank lever 138, as illustrated in Figs. 1 and 4.

The connecting rod 172 further is pivotally connected at 185 with a lever 186 pivoted at 187 upon a stationary bracket 188 under the influence of a spring 186a, and carrying a roller 189 in rolling engagement with a cam 190 having a low section 191 and fixed upon the power shaft 112.

The lever 186 and its associated elements control the suction in the suction head 23 as parts of the indexing means, which further comprises a detent 192 fixed on the shaft 170 of the indexing member 169 and movable into and out of the vertical path of a stop 193 and controlled by a spring 194. The stop 193 is mounted on a tripping member 195, see Fig. 3, the lower forked end 196 of which straddles the power shaft 112. At its upper end the tripping member 195 is provided with spaced transverse lugs 197 which carry two adjustable projections in the form of screws 198 extending toward each other in registry with and above and below a bell-crank lever 199 pivoted at 200 upon a bracket 201 suitably fixed upon the frame 10.

The bell-crank lever 199 carries a valve 202 which controls an air-inlet opening formed in a casing 203 connected with the tube 24 and through the latter with the suction head 23. The casing 203 further is connected by means of a tube 204 with a source of suction. The tripping member 195 carries a roller 205 in rolling engagement with a cam 206 on the shaft 112 whereby the operation of the valve 202 normally is effected to control the suction in the suction head 23. A spring 207 is connected with the tripping member 195 and with an operating member 208 comprising part of the operating mechanism whereby the suction head 23 is raised and lowered on the carriage 13. This operating mechanism, in the illustrated example may be similar to and function in the same manner as the corresponding mechanism in Patent No. 2,227,816 previously referred to herein.

In describing the operation of the machine, it will be assumed that it is being used for sealing boxes 85 having hinged closing flaps or covers 86 and containing for instance a predetermined number of cartridges, it being understood that this is in no sense intended to define the limits of the operative range of the machine.

During an operative period, the boxes 85 are carried along by the upper run of the conveyor 31 with the closed ends of said boxes 85 in sliding surface engagement with one of the guide rails 84 and with the closing flaps or covers 86 in their closed positions in slidable surface contact with the other guide rail 34. As the aforesaid operations proceed, a box 85 with its flap or cover 86 held in its closed position will be delivered to the box supporting member 87 into cooperative relation with the flap member 96 which, at this stage, serves to maintain the flap or cover 86 of said box 85 in the closed position.

In proper operative sequence, the carrier 103 is shifted to the left to the position shown in Fig. 4, by the action of the cam groove 110 on the lever 106. During this operation the roller 139 travels on the end face of the barrel cam 111 so that the slide 116 and members 119 with the fingers 120, 121 and 122 occupy an inoperative lowered position on said carrier 103. Coincidentally with the arrival of the carrier 103 at the left hand terminus of its path of travel, the roller 139 will ride up on a cam nose 140 and accordingly by rocking the lever 135 and bell-crank levers 128 and 129 will elevate the rail 127 which in turn through the co-operation of the groove 126 and roller 125, will raise the slide 116 and members 119 to thereby bring the fingers 120 and 121 into engagement with the opposite ends of said box 85.

As the operation of the machine continues, the cam groove 110 acting on the roller 109 will pivotally rock the lever 106 in a direction to shift the carrier 103 to the right to the dotted line position shown in Fig. 1. The cam noses 140 are so shaped and dimensioned that the roller 139 will remain thereon during this operative step so that the slide 116 and members 119 maintain their raised position with the result that the fingers 120 develop a pushing force whereby the box 85 is shifted along the supporting member 87 from the position A to the position B in Fig. 4. During this movement of the parts the fingers 121 serve to maintain the flap or cover 86 of the box 85 in its closed position, it being understood that the flap member 96 yields against the tension of the spring 101 to permit the box 85 to pass on its way. If a previous box 85 has occupied the position B, the fingers 122 will shift the same on its way as will appear more fully from the description further on. When the box 85 reaches the position B, the roller 139 will leave the cam nose 140 and the lever 135 under the influence of the spring 141 will be pivotally rocked to correspondingly rock the bell-crank levers 128 and 129 in a direction to lower the rail 127 and thereby move the slide 116 downwardly on the carrier 103. This will cause the members 119 and fingers 120, 121 and 122 to be correspondingly moved in a downward direction ready for another operative cycle.

While the above operative steps are being carried out, the carriage 13 and its associated parts will be actuated to cause the suction head 23 to pick up a terminal strip or label 12 from the upper end of the supply stack and transport it in adhesive receiving relation with the adhesive applying roller 27 from which said strip or label 12 receives a coating of adhesive on its one surface.

By the time the box 85 reaches the position B the adhesive coated strip or label 12 has been carried by the suction head into applying position. The suction head 23 is then moved downwardly to deposit said strip or label 12 on the box 85, the relative positions being such that one end portion of said strip or label 12 will be brought into initial adhesive connection with the top of the box 85 with the remainder of said strip or label projecting outwardly beyond an end of said box 85.

In proper operative synchronism the pressure plunger 64 is moved downwardly to cause the pressure member 71 to press the applied end portion of the strip or label 12 into firm adhesive connection with the top of the box 85. After this operative step has taken place, the brush 49 will continue to move downwardly to wipe the intermediate part of the projecting portion of the strip or label 12 into adhesive contact with the end of the box 85 or specifically over and into adhesive connection with the flap or cover 86 of said box 85. During these steps the flap or cover 86 is held in its closed position by

the flap member 141. At this stage the opposite end portion of the strip or label 12 extends downwardly beyond the bottom of the box 85 as illustrated in Fig. 4.

As the mechanism is operated in the manner previously described to shift a successive box 85 from the position A to the position B, the finger 122 will develop a pushing force on the partly sealed box 85 whereby the latter will be shifted over and beyond the horizontal brush 144, or its equivalent. The depending end portion of the strip or label 12 will thereby be wiped into surface engagement with the bottom of the box 85 and adhesively attached thereto to complete the application of said strip or label 12 to said box.

As successive boxes 85 are shifted in the manner set forth, they will engage and force the preceding sealed boxes between the opposed runs of the pressure belts 147 and 155. The latter will continue the advance of the sealed boxes 85 to the point of removal from the machine and during such advance will apply supplemental pressure to the tops and bottoms of said boxes 85 whereby the adhesive application of the strips or labels 12 thereto will be insured. At the same time the action of the belts 147 and 155 will remove any wrinkles or equivalent defects in the applied strips or labels 12 with the result that the latter are smoothly and uniformly applied to said boxes when the latter leave the machine. At the same time the flaps or covers 86 are securely fixed in their closed position to efficiently seal said boxes 85 against unauthorized removal of or tampering with the contents thereof.

During operative periods of the machine, the suction in the suction head 23 is controlled by the indexing means previously referred to herein, in such a manner that if, for some reason, no box 85 is delivered to the position A or for some other reason is not present thereat, no suction will be developed in said suction head 23. Consequently under such conditions the latter will not pick up a terminal sealing strip or label 12 from the supply stack. At the same time the suction head 23 under such conditions will be maintained at a level above that of the adhesive applying roller 27 so that the face of said suction head 23 will not be soiled with adhesive as the carriage 13 is shifted lengthwise of the rail 14 toward the applying station.

As the operative cycle of the machine proceeds, the tripping member 195 with its projections 198 is operated to actuate the valve 202 so as to control the suction in the suction head 23 to pick up successive sealing strips or labels 12 from the supply stack and release said sealing strips or labels 12 at the applying station. At the same time the raising and lowering of said suction head 23 in operative synchronism with the other parts is controlled by the operating member 208 and its associated elements.

Whenever a box 85 is present at the position A in Fig. 4, the rocking movement of the indexing member 169 under the influence of the spring 186a on the lever 186 each time the low section 191 of the cam 190 registers with the roller 189, is prevented by said box 85 which in such position is located beneath the free end of said indexing member 169.

When, however, no box 85 is in the position A the indexing member 169 will be free to rock and the roller 189 will drop into the low section 191 of the cam 190 by the action of the spring 186a. The shaft 170 accordingly will be rocked and will shift the detent 192 beneath the stop 193 of the tripping member 195. The latter as a result will be fixed against downward movement and the valve 202 will not close the air-inlet opening in the casing 203 and therefore no suction will be developed in the suction head 23 and no terminal sealing strip or label 12 will be picked up thereby from the supply stack. At the same time the operating member 208 and its associated parts will be controlled in the same way as in Patent No. 2,227,816 to prevent the suction head 23 from contacting with the adhesive applying roll 27.

As the indexing member 169 is rocked on its pivot 170 because of the absence of a box 85 at station A, the connecting rod 172, by means of the arm 175 rocks the shaft 176 and swings the arm 177 in a direction to develop a pull upon the rod 178. This will swing the arm 180 and rock the shaft 181 in a direction to shift the detent 183 beneath the detent 184 to thereby lock the bell-crank lever 138 and with it the associated mechanism to arrest the raising of the slide 116 and its related elements.

In the form illustrated in Figs. 6 to 10 inclusive, the sealing machine comprises a frame 10b corresponding to the frame 10 of the machine first described on which a supply of sealing strips or labels 12a is supported in any conventional manner, for instance, as shown in Fig. 2. Furthermore, the frame 10a supports the mechanism for conveying individual sealing strips or labels 12a from the supply stack thereof to the application point of the machine, and for providing the strips or labels 12a with coatings of adhesive by means of an adhesive applying roller 27a during such conveyance. The mechanism referred to may be of any suitable type, such as for instance illustrated in Fig. 5 excepting that in the instant form two wiping elements or brushes 49a are included instead of only one brush 49. As a matteer of fact the mechanism under discussion may correspond to and operate similarly to that disclosed in my co-pending application Serial No. 303,564, filed November 9, 1939, and in such case further includes a suction head and its associated elements corresponding to the suction head 23 and associated elements of the first form herein described, or to the corresponding elements of said application. In addition the mechanism comprises pressure means including a pressure member 71a corresponding to the pressure member 71 of the form first described herein and operating in substantially the same way.

The form of the machine now being described, includes an auxiliary frame 10c suitably secured upon the frame 10b and an endless conveyor 81a which passes over pulleys 82a, one of which is mounted on a shaft 83a rotatably mounted on the auxiliary frame 10c in any convenient manner. The conveyor 81a may be operated in any usual way as by operatively connecting the shaft 83a on which the one roller or pulley 82a is fixed, with a suitable source of power such as an electric motor. The upper run of the conveyor 81a travels lengthwise of a guide member or rail 84a in a direction toward the point at which the sealing strips or labels 12a are deposited in applying relation to the boxes 85a to be sealed. The delivery end of the conveyor 81a is located in delivery relation to a box supporting member 87a which is pivoted at 87b upon the auxiliary frame 10c and extends toward an associate support-

ing member 87c adjustably mounted on the frame of the machine as shown in Fig. 9. The supporting member 87a is pivotally adjustable in any convenient manner to different set positions for guiding boxes 85a of different dimensions to the associate supporting member 87c which is vertically adjustable for the same reasons. A horizontal upwardly inclined guide member 209 is located above and in registry with the supporting member 87a for maintaining the advancing boxes in the predetermined path of travel.

The auxiliary frame 10c includes brackets 210 on which supporting members 211 are mounted in spaced registering relation preferably so as to be adjustable toward and away from each other, provision being made in any convenient manner as by screws 212 for fixing said members 211 in adjusted positions. In the operation of the machine successive sealing strips or labels 12a are deposited on said members 211 by the suction head so as to span the space therebetween and with the opposite ends of said sealing strips or labels 12a in temporary adhesive connection with said members 211.

As illustrated in Figs. 7 and 8, the conveyor 81a and the box supporting member 87a are located in registry with an index member 213 which is part of an indexing means designed to control the mechanism for applying the sealing strips or labels 12a in dependence upon the delivery or non-delivery of a box 85a to the position A' in Fig. 7. The index member 213 further is designed to normally act as a stop for arresting the travel of successive boxes 85a in said position A', and is constructed at its upper end to project over said boxes 85a when the latter, in succession, arrive at said station.

The index member 213 is vertically reciprocable in the machine, and at its lower end is connected by means of a pivot pin 214 with a link 215 which in turn is yieldingly connected, under the influence of a spring 216, with an arm 217 fixed upon a shaft 218. The latter is rotatably mounted in the machine and carries a second arm 186a provided with a roller 189a in rolling contact with a cam 190a fixed upon a power shaft 112a suitably journalled in the frame 10b. The shaft 218 carries a third arm 219 connected by means of a link 220 with a latch member 221 pivoted at 222 on the frame 10a and co-operating with a projection 223 on an operating member 208a whereby the suction head is raised and lowered on its carriage during an operative cycle of the machine. The operating member 208a corresponds to the operating member 208 of the form first described and likewise may be similar to and normally function in the same way as the corresponding mechanism in Patent No. 2,227,816 referred to hereinbefore.

The aforesaid indexing means further includes a lever 224 carried by a shaft 225 mounted in the machine and having a recess 226 at its upper end for the reception of a projection 227 on the index member 213, to thereby lock the lever 224 against pivotal action when no box 85a is in position A'. The purpose of this arrangement will appear more fully hereinafter. The projection 227 may, if desired, be adjustably mounted on the index member 213 by means of screws 228 and slots 229.

When a box 85a reaches the position A' in Fig 7 it is shifted transversely to its previous advance by the conveyor 81a, to the sealing strip or label receiving position B' in Fig. 7 beneath and in registry with the strip or label 12a currently supported on the members 211.

In the illustrated example of the machine, the mechanism whereby this transverse shifting of the boxes 85a is effected, comprises a bell-crank lever 230 fixed on the shaft 225 with the lever 224, and provided at its upper end with a pushing member 231 preferably mounted in place by means of a screw 232 and slot attachment 233 so as to be adjustable to different set positions on said lever 230. At its lower end the latter carries a roller 234 in rolling engagement with an operating cam 235 fixed upon the power shaft 112a. A tension spring 230a is effective on the lever 230 to maintain its roller 234 in contact with said cam 235 and to urge said lever 230 toward the left in Fig. 8. The aforesaid transverse shifting of the boxes 85a takes place on the supporting member 87a as illustrated in Fig. 8.

In the operation of the machine, the lever 230 and the lever 224 are rocked in unison to cause the pushing member 231 to swing to and from the dotted line position to the solid line position and vice versa in Fig. 8, to thereby shift a box 85a from the position A' to the position B' and to cause such box 85a to shift a previous box 85a to which a sealing strip or label 12a has been partly applied, from the position B' to enable the application of this strip or label 12a to be completed. Whenever a box 85a is in position A' the index member 213 will be prevented from moving downwardly to any appreciable extent so that the aforesaid operations will be carried out without hindrance.

When however no box 85a is in position A' the index member 213 will move downwardly to cause the projection 227 to enter the recess 226 of the lever 224 to thereby lock the same against pivotal movement. This arrests the rocking movement of the shaft 225 and consequently also arrests the operative movement of the lever 230 and its pushing member 231 and accordingly prevents the box 85a currently in the position B' from being disturbed.

At the same time the rocking of the shaft 218 by the downward movement of the index member 213 swings the latch member 221 into engagement with the projection 223 and thereby locks the operating member 208a against operation to lower the suction head and any strip or label 12a carried thereby.

The machine further includes means whereby the boxes 85a are correctly set in the position B' so that the sealing strips or labels 12a will be uniformly applied to successive boxes.

In the machine as shown in the drawings, this means comprises bell-crank levers 236 pivoted at 237 in the machine in opposed registry with each other and carrying positioning or setting members 238 at their upper ends. Operating rods 239 are pivotally connected at 240 with said bell-crank levers 236, and at 241 are pivotally and yieldingly connected under the influence of springs 242, with the members of a U-shaped yoke 243 fixed upon a shaft 244 conveniently mounted on the frame 10b. The shaft 244 further carries an arm 245 provided at its free end with a roller in rolling engagement with a suitable cam carried by the power shaft 112a and designed to pivotally operate the yoke 243 in a manner to pivotally rock the bell-crank levers 236 and thereby shift the associated setting members 238 toward and away from each other to engage and set the box 86a correctly in position B'.

Subsequently to the application of the sealing

strips or labels 12ª to the top and opposite end surfaces of the boxes 85ª, as will be more fully set forth hereinafter, the latter with the partially applied strips or labels 12ª are transferred to vertically movable means whereby said boxes 85ª are raised to a position in which the opposite end portions of said strips or labels 12ª, which at this stage project freely below the bottoms of said boxes 12ª, are adhesively applied to said bottoms.

The vertically movable means in the form illustrated in the drawings, comprises a slide 246 which is guided in a stationary guideway 247 and is vertically operated by means of a connecting rod 248 and a rocking lever 249 pivotally mounted at 250 on the frame 10ᵇ. The lever 249 carries a roller 251 in rolling engagement with a suitable cam 252 fixed on the shaft 112ª as shown in Fig. 8.

At its upper end the slide 246 terminates in a U-shaped element 253 having spaced upright members 253ª from which angle-members 254 each carrying angle guide members 255 project in a common horizontal direction, as illustrated in Fig. 8, the guide members 255 extending beyond the angle members 254 as shown. A supporting member 256 projects from the base of the aforesaid U-shaped element 253 in spaced horizontal parallelism with the guide members 255 and centrally between the same, said member 256 being relatively narrow as shown in Fig. 6.

Suitable means is provided for adhesively applying the free end portions of the sealing strips or labels 12ª to the bottoms of the boxes 85ª, which means, in the illustrated example, includes horizontal brushes 257 of a length corresponding approximately to length of the guide members 255 beyond the upright members 253ª as shown in Fig. 8. The backs 258 of the brushes 257 are secured to angle members 259 which in turn are adjustably mounted in surface engagement with angle-irons 260 by means of screws 261 movable in slots 262 as illustrated in Fig. 8.

The angle-irons 260, in turn, are carried by bell-crank levers 263 pivoted at 264 in the machine in opposed registering relation with each other, and preferably provided with lugs 265 arranged to engage stops 266 for arresting the rocking movements of said levers 263 toward each other. The stops 266 preferably are adjustable and are mounted on a suitable part of the machine, as for instance the guideway 247. The arrangement is such that the brushes 257 and the backs 258 thereof are located above the normal lowered position of the supporting member 256, which in such position is at approximately the same level as the associate supporting member 87ᶜ.

Any suitable mechanism may be provided for operating the brushes 257 in proper synchronism and timing with the other parts of the machine. The mechanism referred to may for instance, comprise operating rods 267 pivotally connected at 268 with the bell-crank levers 263 and pivotally connected at 269 under the influence of springs 270 with the spaced arms 271 of a rocking member 272. The latter is pivotally mounted at 250 in the machine and includes an integral member 273 provided at its free end with a roller 274 in rolling engagement with a suitable operating cam 275 on the shaft 112ª.

In describing the second form of the machine illustrated in Figs. 6 to 10 inclusive, it will be assumed that it is being used for sealing boxes 85ª having telescopic covers 86ª, it being understood that the machine may be used with equal efficiency on any other type of box or similar article for applying a strip or label to the tops, ends, and bottoms thereof.

During an operative period, the boxes 85ª with the covers 86ª in place thereon are carried along by the upper run of the conveyor 81ª and are finally transferred in succession to the supporting member 87ª. The advance of the boxes along the supporting member 87ª is brought about by successive boxes engaging and pushing the boxes in advance thereof until finally one of the boxes reaches the associate supporting member 87ª in abutting engagement with the index member 213. At this stage in the operations, the pushing member 231 of the bell-crank lever 230 occupies the dotted line position shown in Fig. 8 or in other words, projects behind the box 85ª currently located in the position A' in said Fig. 8. In proper timing the shaft 225 is rocked on its axis to operate the lever 230 in a direction to swing the pushing member 231 toward the left in Fig. 8 to the position B' therein. When the box 85ª reaches the position B' the bell-crank levers 236 will be operated to cause the positioning or setting members 238 thereof to correctly set said box 85ª in said position B' in proper relation to the applying mechanism whereby a sealing strip or label 12ª is initially applied to said box.

In proper operative synchronism with the aforesaid operations, the suction head of the machine and its associated elements have been or are operated to pick up a sealing strip or label 12ª from the supply stack and to pass it in adhesive receiving relation to the adhesive applying roller 27ª and subsequently to deposit the opposite ends of said strip or label 12ª upon the supporting members 211 in temporary adhesive connection therewith and so as to span the space therebetween as illustrated by dotted lines in Fig. 7.

At the proper moment, the pressure member 71ª will be operated downwardly to press the intermediate portion of the sealing strip or label 12ª upon the top of the box 85ª currently in the position B', and in proper synchronism therewith the brushes 49ª will be shifted downwardly to withdraw the ends of the sealing strip or label 12ª from the supporting members 211 and to adhesively apply said sealing strip or label 12ª to the opposite ends of said box 85ª. At this stage, the opposite free ends of the sealing strip or label 12ª depend downwardly beyond the bottom of said box 85ª. At this point in the operative cycle of the machine the supporting member 256 carried by the slide 246 occupies its lowered position at a common level with the associate supporting member 87ᶜ. At this time the lever 230 is operated to cause its pushing member 231 to shift the next successive box 85ª from the position A' in Fig. 8 to the position B' therein and to thereby transfer the preceding box 85ª with the sealing strip or label 12ª partly applied thereto from said position B' into place upon the right hand end portion of the supporting member 256 beneath and in engagement with the guide members 255. The slide 246 is then moved upwardly in the guideway 247 to raise the supporting member 256 and with it the box 85ª in position thereon. As these operations take place, the backs 258 of the brushes 257 will be engaged by the relatively moving opposite ends of the box 85ª, so that said backs 258 will press those portions of the sealing strip or label 12ª previously applied thereto into firm adhesive en-

gagement with said box ends. When the slide 246 and its associated elements including the supporting member 256 reach their uppermost position, the bell-crank levers 263 will be pivotally swung toward each other to correspondingly actuate the brushes 257 and thereby cause the latter to fold or wipe the depending free end portions of the previously applied sealing strip or label 12a into adhesive engagement with the bottom of the box 85a.

As the operative cycle of the machine is continued, successive boxes 85a will pass from the position B' in Fig. 8 to the supporting member 256 and will advance previous boxes 86 in place on said supporting member 256 until finally successive completely sealed or labeled boxes 86a pass from the machine into a suitable receptacle or be otherwise removed therefrom. As the boxes 86a pass along the supporting member 256, each box will be guided by the guide members 255 and be acted upon a plurality of times, that is three times in the illustrated example, by the brushes 257 so that the free end portions of the sealing strips or labels 12a will be securely and uniformly attached to the bottoms of the respective boxes 86a.

If during an operative period of the machine a box 86a fails to reach the position A', the index member 213 and its associated elements will be operated to arrest certain functions of the mechanism as previously pointed out herein to thereby avoid any interruption of or interference with the proper operation of the machine.

In all of its forms the machine is of maximum efficiency for its intended purposes and requires no particularly skilled supervision in its operation.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. In a machine of the kind described, the combination of means for receiving and supporting an article in an initial position in said machine, means for shifting said article from said initial postion to an arrested receiving position at an applying station therein, means operative at said applying station for adhesively applying predetermined portions of a sealing strip to said arrested article and leaving said strip otherwise free therefrom, means for shifting said article with the partly applied strip from said applying station, and means for completing the adhesive application of said strip to said article during said shifting thereof.

2. In a machine for sealing boxes having movable covers, the combination of means for receiving and supporting a box in an initial position in said machine, means for shifting said box from said initial position to an arrested receiving position at an applying station therein, means operative at said applying station for adhesively applying predetermined portions of said strip to said arrested box to include the cover thereof and leaving said strip otherwise free from said box means for shifting said box with the partly applied strip from said applying station, and means for completing the adhesive application of said strip to said box to secure the cover thereof in its closed position.

3. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means for shifting said box from said predetermined point to a stationary sealing strip receiving position, means for continuing the shifting of said box subsequent to a rest period at said stationary sealing strip receiving position, and means having an operative applying cycle which begins with an initial deposit of a sealing strip on said box during said rest period at said stationary receiving position and is completed during said continued shifting of said box from said stationary sealing strip position, for applying said sealing strip to opposed surfaces of the body of said box to secure said cover against pivotal movement relatively thereto.

4. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination of means for receiving and supporting a box at a predetermined point in said machine, means for shifting said box from said predetermined point to a stationary sealing strip receiving position, means for continuing the shifting of said box subsequent to a rest period at said stationary sealing strip receiving position, and means having an operative cycle beginning with an initial deposit of a sealing strip on said box during said rest period at said stationary receiving position and completed during said continued shifting of said box from said stationary sealing strip receiving position, for applying said sealing strip to the body of said box to secure said cover against telescopic movement relatively to said body.

5. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means for shifting said box from said predetermined point to a stationary sealing strip receiving position, means associated with said shifting means for maintaining the hinged cover of said box in its closed position during said shifting, means operative at said sealing strip receiving position for maintaining said cover in said closed position during a rest period of said box thereat, means for continuing the shifting of said box subsequent to said rest period, and means having an operative applying cycle which begins with an initial deposit of a sealing strip on said box during said rest period at said stationary receiving position and is completed during said continued shifting of said box from said stationary sealing strip receiving position, for applying said sealing strip to opposed surfaces of the body of said box to secure said cover in its closed position.

6. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for maintaining said hinged cover against pivotal movement, means for shifting said box from said predetermined point to a stationary sealing strip receiving position, means associated with said shifting means for maintaining said hinged cover in its closed position during said shifting, means for continuing the shifting of said box subsequent to a rest period at said sealing strip receiving position, and means for initially applying a sealing strip to said cover while said box is at rest and subsequently to opposed surfaces of the body of said box during said continued shifting thereof to secure said cover in its closed position.

7. In a machine for sealing boxes comprising bodies having hinged covers, the combination of

means for receiving and supporting a box at a predetermined point in said machine, yieldable means at said predetermined point for temporarily maintaining said hinged cover in said closed position, means for shifting said box from said predetermined point to a stationary sealing strip receiving position, means independent of said yieldable means associated with said shifting means for maintaining said cover in said closed position during such shifting, and means having an applying cycle which begins with an initial deposit of a sealing strip on said stationary box at said receiving position and subsequently continues for applying a sealing strip to said cover and to opposed surfaces of the body of said box to secure said cover in its closed position.

8. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for temporarily maintaining said hinged cover in its closed position, a horizontal stationary rail, a carrier slidably mounted on said rail, vertical guides on said carrier, a slide vertically reciprocable in said guides, spaced horizontal members carried by said slide, yielding fingers mounted on said members for engagement with opposite ends of said box to respectively develop a pushing force thereon and to maintain said cover in said closed position, a vertically movable rail provided with a groove extending lengthwise thereof, a roller on said slide movable in said groove whereby said slide is coupled to said vertically movable rail, pivoted bell-crank levers connected with each other and with said vertically movable rail, a rotatably mounted shaft, a rocking lever fixed on said shaft and connected with one of said bell-crank levers, an operating bell-crank lever secured on said shaft, a roller carried by said last named bell-crank lever, a cam effective on said roller and its bell-crank lever to rock said shaft and rocking lever whereby said pivoted bell-crank levers are actuated to raise and lower said vertically movable rail and to thereby correspondingly operate said slide and spaced horizontal members to operative and inoperative positions and vice versa, said yielding fingers engaging said box at its opposite ends in the operative position of said spaced horizontal members, means for slidably reciprocating said carrier on said stationary rail whereby said box is shifted from said predetermined point while said slide and spaced horizontal members are in the operative position, and means for subsequently applying a sealing strip to said cover and to opposed surfaces of the body of said box to secure said cover in its closed position.

9. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for temporarily maintaining said hinged cover in its closed position, a horizontal stationary rail, a carrier slidably mounted on said rail, vertical guides on said carrier, a slide vertically reciprocable in said guides, spaced horizontal members carried by said slide, yielding fingers mounted on said members for engagement with opposite ends of said box to respectively develop a pushing force thereon and to maintain said cover in said closed position, a vertically movable rail provided with a groove extending lengthwise thereof, a roller on said slide movable in said groove whereby said slide is coupled to said vertically movable rail, pivoted bell-crank levers connected with each other and with said vertically movable rail, means for operating said bell-crank levers to raise and lower said vertically movable rail and to thereby correspondingly operate said slide and spaced horizontal members to operative and inoperative positions and vice versa, said yielding fingers engaging said box at its opposite ends in the operative position of said spaced horizontal members, means for slidably reciprocating said carrier on said stationary rail whereby said box is shifted from said predetermined point while said slide and spaced horizontal members are in the operative position, and means for subsequently applying a sealing strip to said cover and to opposed surfaces of the body of said box to secure said cover in its closed position.

10. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for temporarily maintaining said hinged cover in its closed position, a horizontal stationary rail, a carrier slidably mounted on said rail, vertical guides on said carrier, a slide vertically reciprocable in said guides, spaced horizontal members carried by said slide, yielding fingers mounted on said members for engagement with opposite ends of said box to respectively develop a pushing force thereon and to maintain said cover in said closed position, a vertically movable rail provided with a groove extending lengthwise thereof, a roller on said slide movable in said groove whereby said slide is coupled to said vertically movable rail, means for raising and lowering said vertically movable rail to thereby correspondingly operate said slide and spaced horizontal members to operative and inoperative positions and vice versa, said yielding fingers engaging said box at its opposite ends in the operative position of said spaced horizontal members, means for slidably reciprocating said carrier on said stationary rail whereby said box is shifted from said predetermined point while said slide and spaced horizontal members are in the operative position, and means for subquently applying a sealing strip to said cover and to opposed surfaces of the body of said box to secure said cover in its closed position.

11. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for temporarily maintaining said hinged cover in its closed position, a horizontal stationary rail, a carrier slidably mounted on said rail, vertical guides on said carrier, a slide vertically reciprocable in said guides, spaced horizontal members carried by said slide, yielding fingers mounted on said members for engagement with opposite ends of said box to respectively develop a pushing force thereon and to maintain said cover in said closed position, means for raising and lowering said slide and spaced horizontal members on said carrier to operative and inoperative positions and vice versa, said yielding fingers engaging said box at its opposite ends in the operative position of said spaced horizontal members, means for reciprocating said carrier on said stationary rail whereby said box is shifted from said predetermined point while said slide and spaced horizontal members are in the operative position, and means for subsequently applying a sealing strip to said cover

and to opposed surfaces of the body of said box to secure said cover in its closed position.

12. In a machine for sealing boxes having movable covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means for shifting said box from said predetermined point, means for subsequently applying a sealing strip to said box to secure the cover thereof against relative movement, and indexing means effective at said predetermined point for arresting the operation of said shifting means and applying means when no box is present at said predetermined point.

13. In a machine for sealing boxes comprising bodies having hinged covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means at said predetermined point for temporarily maintaining said hinged cover in its closed position, a horizontal stationary rail, a carrier slidably mounted on said rail, vertical guides on said carrier, a slide vertically reciprocable in said guides, spaced horizontal members carried by said slide, yielding fingers mounted on said members for engagement with opposite ends of said box to respectively develop a pushing force thereon and to maintain said cover in said closed position, a vertically movable rail provided with a groove extending lengthwise thereof, a roller on said slide movable in said groove whereby said slide is coupled to said vertically movable rail, pivoted bell-crank levers connected with each other and with said vertically movable rail, a rotatably mounted shaft, a rocking lever fixed on said shaft and connected with one of said bell-crank levers, an operating bell-crank lever secured on said shaft, a roller carried by said last named bell-crank lever, a cam effective on said roller and its bell-crank lever to rock said shaft and rocking lever whereby said pivoted bell-crank levers are actuated to raise and lower said vertically movable rail and to thereby correspondingly operate said slide and spaced horizontal members to operative and inoperative positions and vice versa, said yielding fingers engaging said box at its opposite ends in the operative position of said spaced horizontal members, means for slidably reciprocating said carrier on said stationary rail whereby said box is shifted from said predetermined point while said slide and spaced horizontal members are in the operative position, means including a suction head for subsequently applying a sealing strip to said cover and to opposed surfaces of the body of said box to secure said cover in its closed position, a tripping member for controlling the suction in said suction head, an associate detent on said operating bell-crank lever, a shaft journalled in said machine, an arm fixed upon said shaft, a locking detent carried by said arm in co-operative relation to said associate detent, a stub shaft journalled in said machine, an arm fixed upon said stub shaft connected with the arm on the last previously mentioned shaft, a second arm secured on said stub shaft, an indexing shaft located adjacent said predetermined point, an indexing member carried by said indexing shaft and projecting over said predetermined point, a connecting rod connecting said indexing member with said second arm, a detent fixed on said indexing shaft, and a stop on said tripping member in co-operative relation to said last named detent, and means for operating said indexing member, when no box is present at said predetermined point, to thereby shift said locking detent into engagement with said associate detent and to adjust said last named detent into engagement with said stop whereby elevation of the vertically movable rail is arrested and the development of suction in said suction head is prevented.

14. In a machine for sealing boxes having movable covers, the combination of means for receiving and supporting a box at a predetermined point in said machine, means for shifting said box to an arrested position at a receiving station, means for initially applying a sealing strip to said arrested box subsequently to its receipt at said receiving station to secure the cover of said box in its closed position, means for shifting said box with said initially applied label from said receiving station, pressure belts having opposed runs in spaced parallel superimposed relation to each other, the lower of said belts receiving and supporting said box and means for operating said belts to cause the opposed runs thereof to subsequently apply supplemental pressure to said box to firmly fix the applied sealing strip in place thereon and to coincidentally advance said box for removal from the machine.

15. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination means for receiving and supporting a box at a predetermined point in said machine, supporting members located in spaced registry with each other for supporting an adhesive coated sealing strip in applying position, means for depositing said sealing strip on said supporting members to span the space therebetween and with the opposite ends of said strip in temporary adhesive connection with said supporting members, a shaft rotatably mounted in said machine, a bell-crank lever fixed on said shaft, a pushing member carried by said bell-crank lever at one end, a roller carried by said bell-crank lever at its other end, an operating cam effective on said roller to pivotally rock said bell-crank lever to cause said pushing member to shift said box from said predetermined point into receiving relation with the sealing strip on said supporting members, means for positioning said box in said receiving relation, means for applying the intermediate portion of said sealing strip to the top surface of said cover, means for withdrawing the ends of said strip from said supporting members and for applying the sealing strip to opposite end surfaces of said cover with the opposite ends of said sealing strip projecting below the bottom of the body of said box, a stationary guideway, a slide vertically slidable in said guideway, a U-shaped element mounted on the upper end of said slide, a supporting member projecting from the base of said U-shaped element and arranged to receive and support the box subsequently to the partial application of the sealing strip thereto, guide members in spaced parallel relation to said supporting member for guiding the box thereon, means for elevating said slide and its associated elements to thereby shift the box on said supporting member to a level above the previous strip receiving position, horizontal brushes located in opposed registering relation on opposite sides of U-shaped element, pivoted bell-crank levers carrying said brushes, and means for pivotally operating said bell-crank levers whereby said horizontal brushes are caused to fold the depending ends of the sealing strip beneath the bottom of the body of said box and to adhesively apply the same thereto and thereby secure the cover against relative telescopic movement.

16. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination means for receiving and supporting a box at a predetermined point in said machine, supporting members located in spaced registry with each other for supporting an adhesive coated sealing strip in applying position, means for depositing said sealing strip on said supporting members to span the space therebetween and with the opposite ends of said strip in temporary adhesive connection with said supporting members, a shaft rotatably mounted in said machine, a bell-crank lever fixed on said shaft, a pushing member carried by said bell-crank lever at one end, a roller carried by said bell-crank lever at its other end, an operating cam effective on said roller to pivotally rock said bell-crank lever to cause said pushing member to shift said box from said predetermined point into receiving relation with the sealing strip on said supporting members, means for positioning said box in said receiving relation, means for applying the intermediate portion of said sealing strip to the top surface of said cover, means for withdrawing the ends of said strip from said supporting members and for applying the sealing strip to opposite end surfaces of said cover with the opposite ends of said sealing strip projecting below the bottom of the body of said box, vertically movable means for receiving and supporting the box subsequently to the partial application of the sealing strip thereto and for raising said box to a level above the previous strip receiving position, and means operative at said higher level for adhesively applying the depending ends of the sealing strip to the bottom of the body of said box.

17. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination means for receiving and supporting a box at a predetermined point in said machine, supporting members located in spaced registry with each other for supporting an adhesive coated sealing strip in applying position, means for depositing said sealing strip on said supporting members to span the space therebetween and with the opposite ends of said strip in temporary adhesive connection with said supporting members, a shaft rotatably mounted in said machine, a bell-crank lever fixed on said shaft, a pushing member carried by said bell-crank lever at one end, a roller carried by said bell-crank lever at its other end, an operating cam effective on said roller to pivotally rock said bell-crank lever to cause said pushing member to shift said box from said predetermined point into receiving relation with the sealing strip on said supporting members, means for disconnecting the sealing strip from said supporting means and for applying said sealing strip to the top and opposite end surfaces of said cover with the opposite ends of said sealing strip extending below the bottom of the body of said box, vertically movable means for receiving and supporting said box subsequently to the partial application of the sealing strip thereto and for raising said box to a level above the previous strip receiving position, and means operative at said higher level for adhesively applying the depending ends of the sealing strip to the bottom of the body of said box.

18. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination means for receiving and supporting a box at a predetermined point in said machine, supporting members located in spaced registry with each other for supporting an adhesive coated sealing strip in applying position, means for depositing said sealing strip on said supporting members to span the space therebetween and with the opposite ends of said strip in temporary adhesive connection with said supporting members, means for shifting said box from said predetermined point into receiving relation with the sealing strip on said supporting members, means for disconnecting the sealing strip from said supporting members and for applying said sealing strip to the top and opposite end surfaces of said cover with the opposite ends of said sealing strip extending below the bottom of the body of said box, vertically movable means for progressively receiving and supporting a plurality of boxes subsequently to the partial application of sealing strips thereto and for raising said boxes to a level above the previous strip receiving position, and mean operative at said higher level for adhesively applying the depending ends of the sealing strip to the bottoms of the bodies of the supported boxes, said last named means being repeatedly effective on said ends of the sealing strips throughout the progress of said boxes on said supporting member.

19. In a machine for sealing boxes comprising bodies and covers telescopically combined therewith, the combination means for receiving and supporting a box at a predetermined point in said machine, supporting members located in spaced registry with each other for supporting an adhesive coated sealing strip in applying position, means including a suction head for depositing said sealing strip on said supporting members to span the space therebetween and with the opposite ends in temporary adhesive connection with said supporting members, an operating member for controlling the suction in said suction head, shifting means for shifting said box from said predetermined point into receiving relation with the sealing strip on said supporting members, means for applying said sealing strip to the top surface and opposite end surface of said cover and to the bottom of the body of said box, an index member located in operative relation to said predetermined point, means for operating said index member, a projection on said index member, a projection on said operating member, a latch member in operative relation to the projection on said operating member, and a lever movable with said shifting means and provided with a recess movable into the path of the projection on said index member, said index member being restricted in its operation when a box is present at said predetermined point and otherwise being unrestricted in its operation whereby said projection on said index member is shifted into the recess of said lever to lock said shifting means against operation when no box is present at said predetermined point and said latch member is engaged with the projection on said operating member to restrain the latter against operation and thereby coincidentally prevent the development of suction in said suction head when no box is in place at said predetermined point.

GEORGE W. VON HOFE.