Nov. 29, 1927. 1,651,249

H. BRIDGMAN

BOX FLY APPLYING MACHINE

Filed June 9, 1926 5 Sheets-Sheet 1

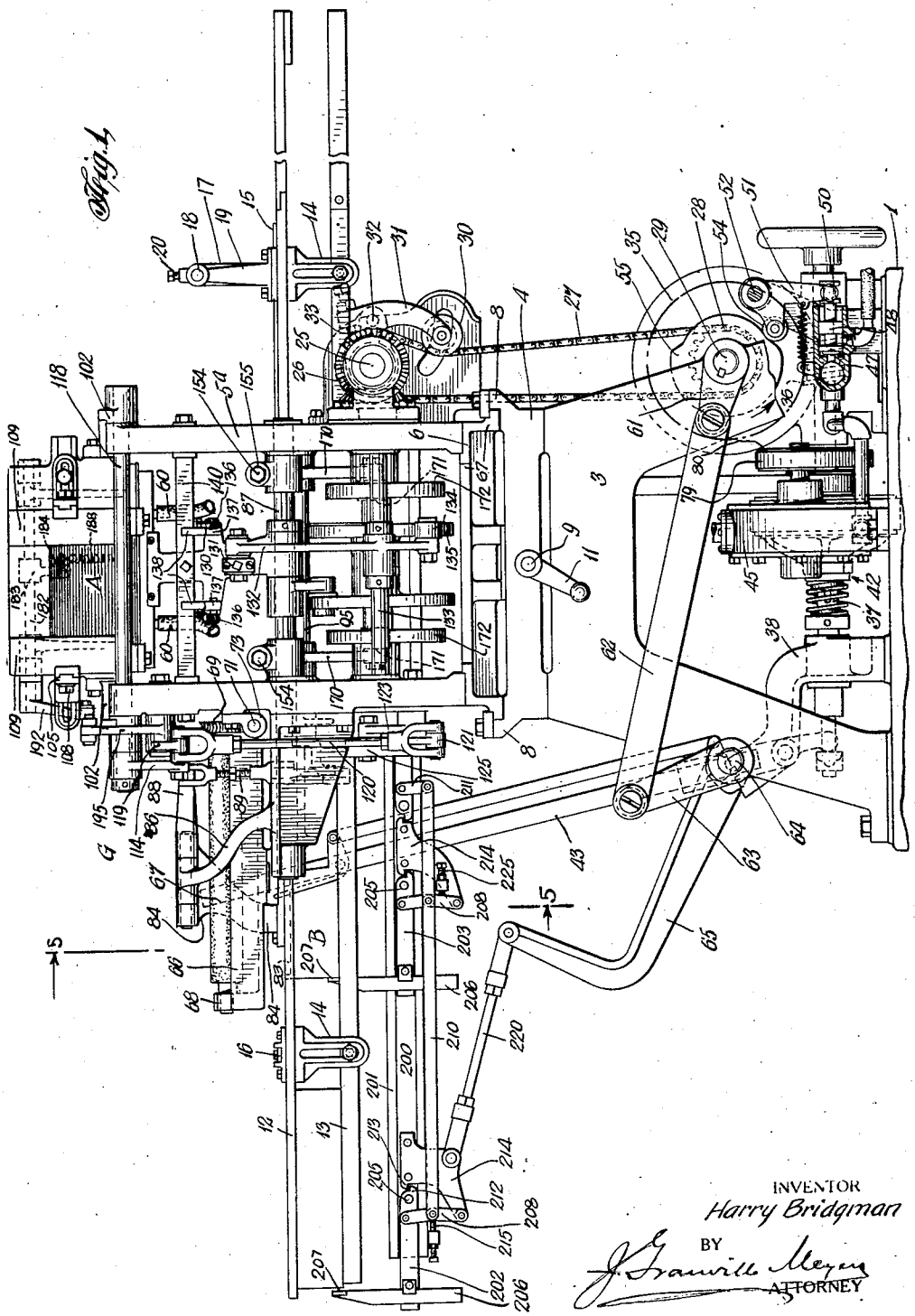


Fig. 1

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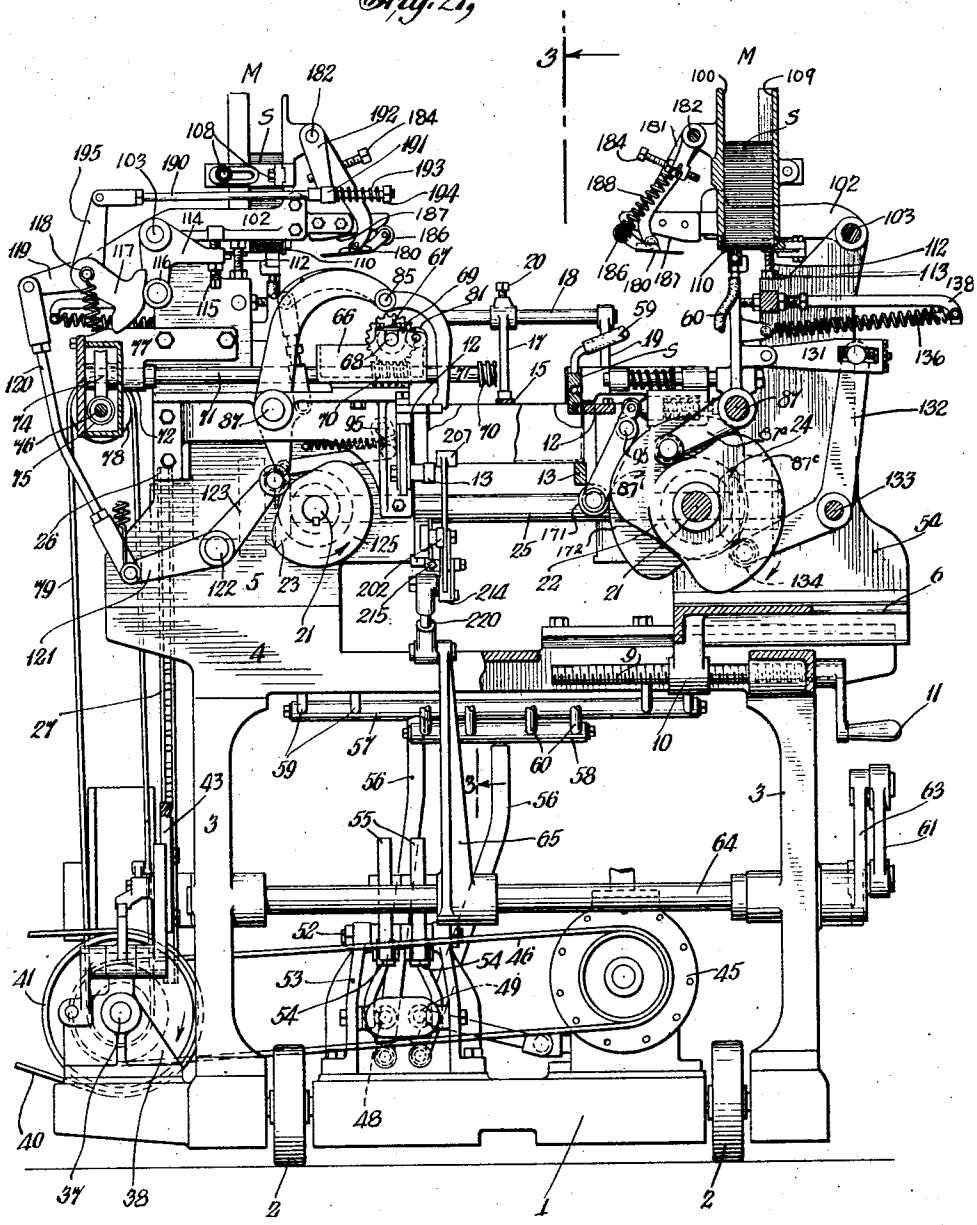
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BOX FLY APPLYING MACHINE

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Fig. 2,



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BOX FLY APPLYING MACHINE

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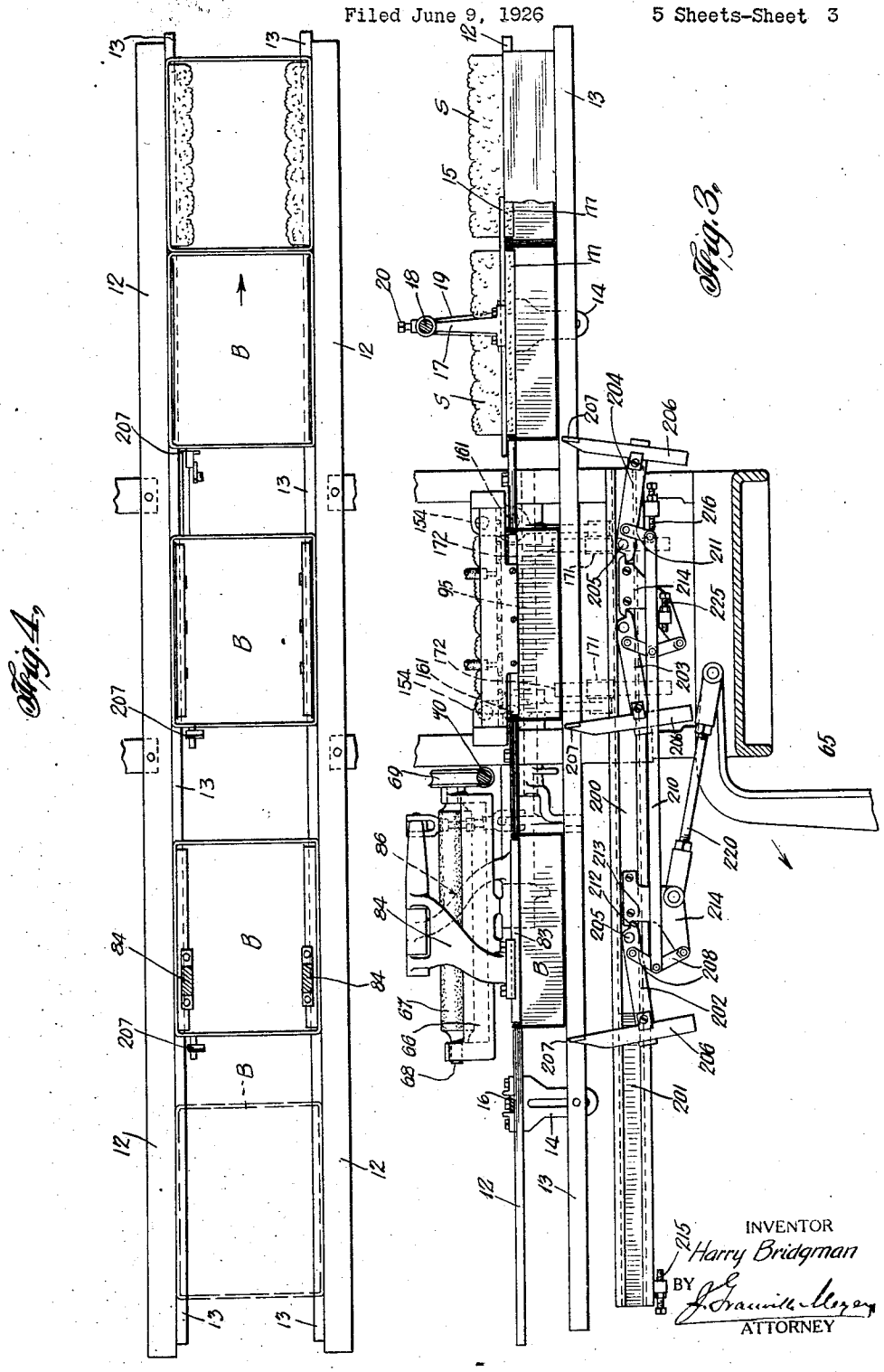


Fig. 3.

Fig. 4.

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BOX FLY APPLYING MACHINE

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Fig. 5.

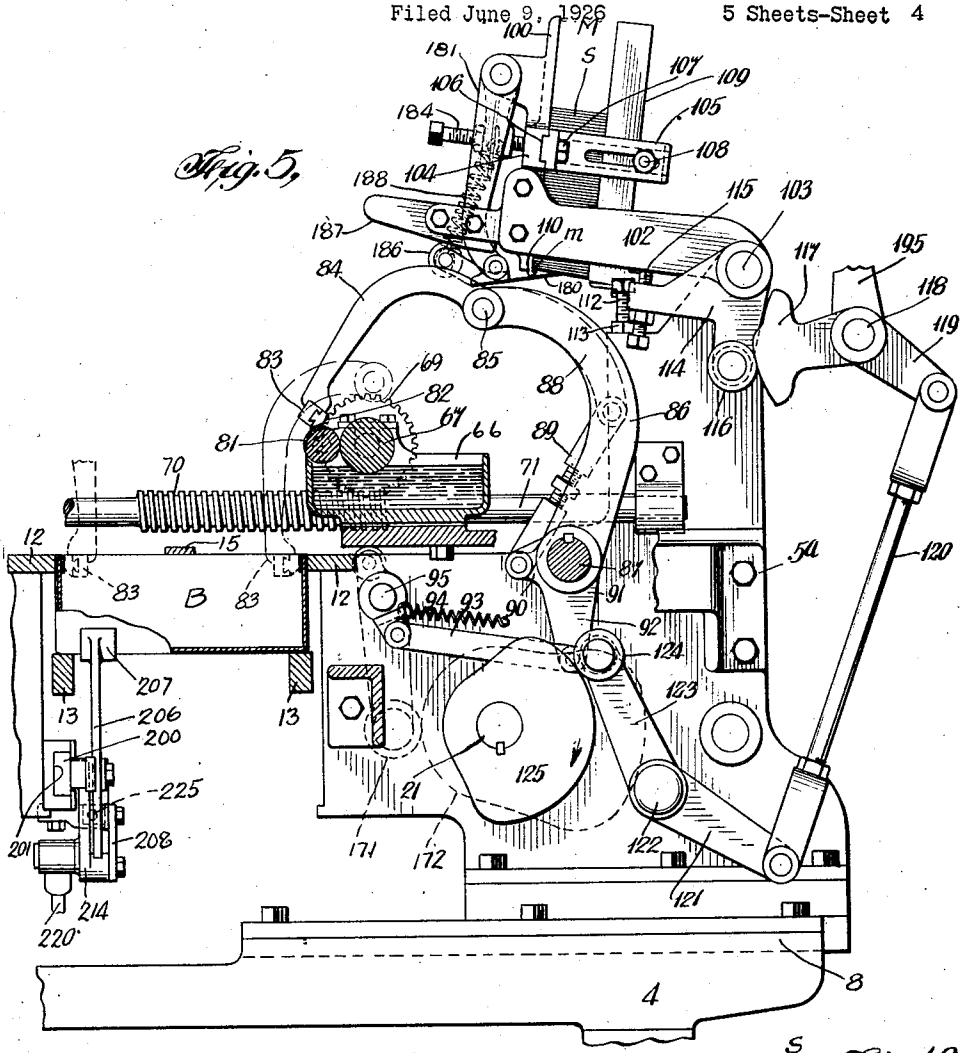


Fig. 9.

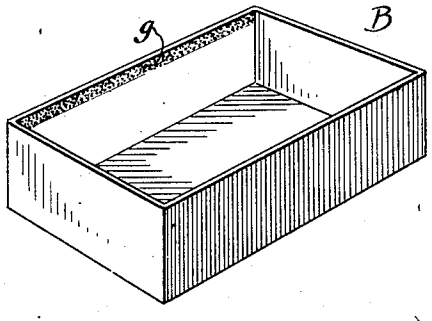
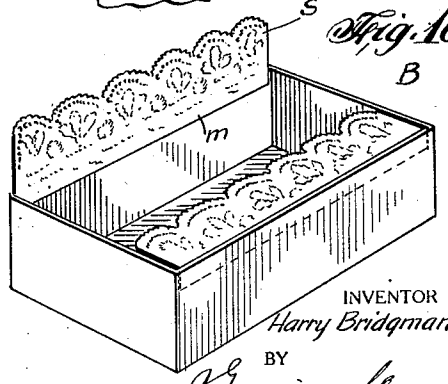


Fig. 10.



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BOX FLY APPLYING MACHINE

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Fig. 7.

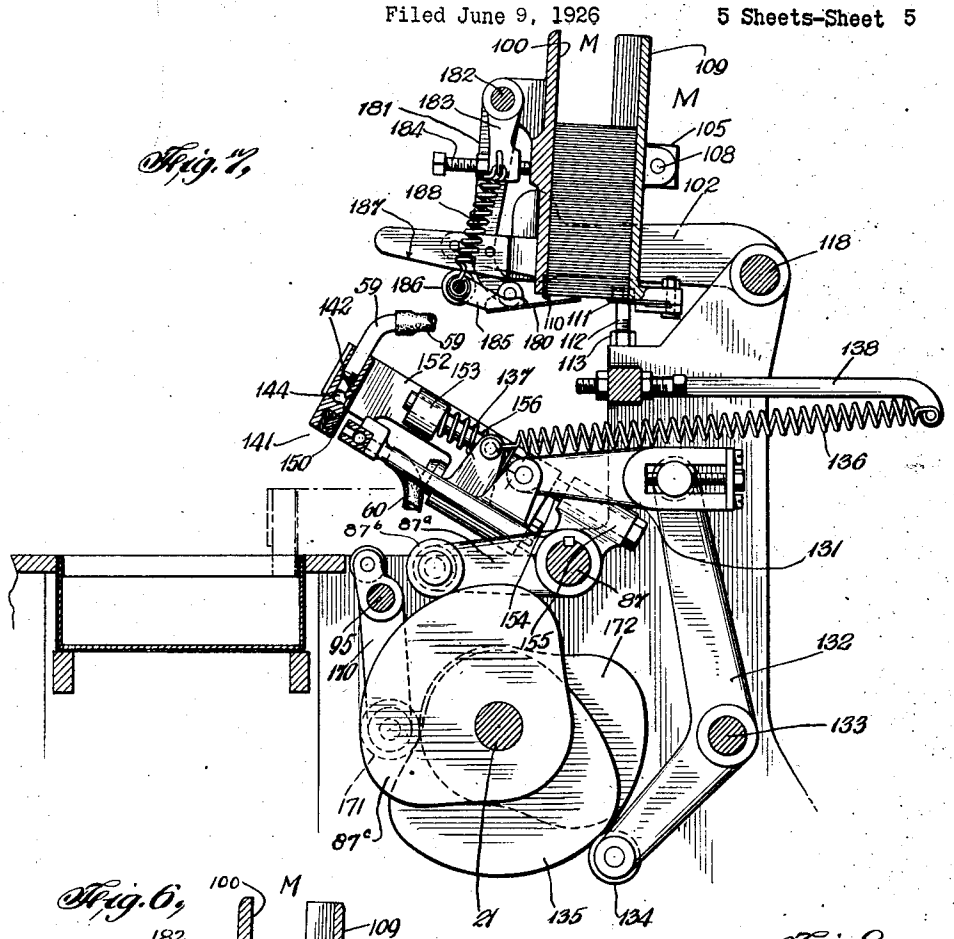


Fig. 6.

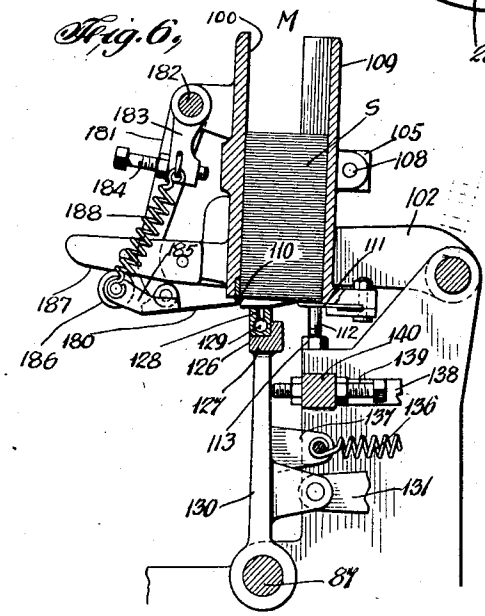
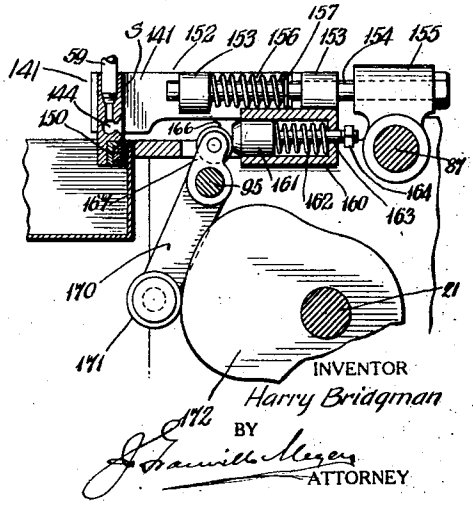


Fig. 8.



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UNITED STATES PATENT OFFICE.

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BOX-FLY-APPLYING MACHINE.

Application filed June 9, 1926. Serial No. 114,661.

This invention relates to machine for applying paper strips or "flies" to boxes. In the present specific embodiment it is devised to apply strips of lace paper to opposite inner wall margins of boxes; but in the broader aspect of the invention it is not limited to this specific use, but may be employed, with or without modification, for other analogous purposes.

The general object is to provide a machine of simple and durable construction, which will rapidly and accurately apply the lace or other strips to successive boxes, and which is therefore capable of producing a large output at low operating cost.

Another object is to provide in a machine of this general character, means for accurately feeding or positioning the successive parts, for applying adhesive to the inner upper margins of opposite box walls, and for then accurately applying to the adhesive surfaces, the margins of the lace paper or other decorative or finishing strips, or "flies".

Another object is to supply the "flies" in the form of separate strips, arranged in stacks, and to provide means for accurately selecting and "feeding" the strips, one at a time from each stack, and applying them to opposite box sides.

Another object is to provide a machine having all necessary adjustments for different box dimensions, and further to so organize the machine that these adjustments may be made with ease and accuracy.

Another object is to improve the structure and mode of operation of machines of this class in various ways, as fully set forth hereafter.

The characteristics and advantages of the invention are further sufficiently explained in connection with the following detail description of the accompanying drawings, which show one representative embodiment of the invention. After considering this example, skilled persons will understand that many variations may be made, and I contemplate the employment of any structures that are properly within the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevation of a machine embodying the invention in one form.

Fig. 2 is a view, mainly in front end elevation, that is in elevation from the left of Fig. 1, with some parts in section.

Fig. 3 is a fragmentary view, mainly in elevation in the general plane 3—3, Fig. 2, showing principally the box feed and guide mechanism, with certain parts of the gluing and strip affixing mechanisms.

Fig. 4 is a fragmentary plan view in the plane of the tops of the box parts, showing mainly the box guides and feed devices, with other parts omitted.

Fig. 5 is a fragmentary section, enlarged, in the approximate plane 5—5, Fig. 1.

Fig. 6 is a fragmentary detail of the strip-feed mechanism, with the strip-feed suction head in strip-receiving position.

Fig. 7 is a detail of the strip feed, transfer and applying mechanism with the parts in strip-transferring position.

Fig. 8 shows the strip applying mechanism in strip-applying position.

Fig. 9 is a perspective view of a box part bottom section after application of glue stripes to opposite wall margins.

Fig. 10 shows the box part after application of the finishing strips or "flies", which are in this instance, lace paper.

The general plan or organization and operation of the machine is such that the successive box parts are advanced intermittently to and through the machine, each box being positioned first at a gluing station where the opposite side wall margins are glued, and then at a strip applying station where margins of the lace paper or other finishing strips or "flies", advanced from magazines where the strips are arranged in stacks, are applied to the glued box surfaces, after which the boxes are moved away for any convenient disposition. The feed mechanism is so organized that no adjustment is necessary for different box lengths, these variations being provided for simply by the provision of glue pads or stencils and strip selecting and applying heads of different lengths, which may be interchangeably secured to their respective supporting and operating devices. To provide for different box widths, the gluing and applying mechanism at one side of the machine, together with a supporting and side guide rail for the corresponding side of the box, are in fixed position, while the gluing and applying mechanism and corresponding rails for the other side of the box are adjustable as an operative unit transversely of the machine. The feed mechanism is so arranged that it

operates properly upon boxes of different widths without regard to the adjustment of the movable gluing and affixing mechanism. For the sake of brevity the gluing and affixing mechanisms, when referred to collectively, will be called "stripping" mechanisms, since glue stripping and application of the strips or flies, are both essential steps of the total stripping operation.

The machine is built upon a base 1 provided with wheels 2. On the base are side standards 3 supporting a horizontal intermediate or bed plate 4 which is below the feed level. At the left side of the machine, as viewed in Fig. 2, or from the left or feed end, Fig. 1, a framework including uprights 5 is mounted in fixed position to support the fixed stripping mechanism (see above) and also the box supporting and guide rails at that side of the machine. At the right hand side is an adjustable framework comprising the uprights 5^a secured to a plate 6 which has flanged feet 7 mounted in guides 8 for adjustment toward and from the fixed gluing and applying mechanism by means of a screw 9 mounted for rotation and fixed against axial movement, engaging in a threaded sleeve 10 depending from plate 6 and provided with a crank handle 11. The movable frame carries the movable stripping mechanism, and the movable supporting and guide rails, and by rotation of the crank 11 may be moved toward and from the fixed stripping mechanism to simultaneously adjust the supporting and guide rails and the stripping mechanisms, in accordance with the width of boxes to be stripped. It is here noted that reference to box length and width has no necessary limiting significance although when the boxes are of other than square outline it is usually desirable to feed them endwise, that is, with their longer dimension moving longitudinally through the machine.

Opposite upper guide rails 12 are secured to the fixed and movable frame members 5 and 5^a respectively. The inner edges of these rails are aligned with the upper margins of the box side walls, the upper faces of the rails being in the plane of the upper wall edges. At the gluing and affixing stations, these rails or their inward faces also act as pressing abutments, as later explained.

Lower supporting rails 13 are secured to slotted brackets 14 depending from the fixed and movable upper rails 12. The supporting rails are provided with bolts passing through the bracket slots so that they may be adjusted in accordance with box height and secured in position.

Desirably, a top guard or guide rail 15 is also provided, located with slight clearance above the upper box edges, or slightly above the plane of the upper faces of rails 12. This top rail is carried by a cross piece 16 near the front of the machine, and by a vertical strut 17 mounted on a cross bar 18 between uprights 19, these uprights being mounted on the side rails 12 near the rear of the machine. The peculiar mounting of the top rail at the rear is to accommodate the upstanding flies between the uprights 19 and strut 17, as the boxes with the affixed flies pass away from the affixing mechanism. Desirably, the top rail is adjusted laterally so that it may be substantially centered over boxes of different widths, this adjustment being sufficiently explained by the slidably arrangement of the strut 17 on cross bar 18 and set screw 20 to lock the strut in adjusted position. A similar adjustable mounting may be provided on the front cross bar.

Most of the movable parts of each stripping mechanism are operated by or from a longitudinal cam shaft 21 mounted in bearings in the frame members 5 or 5^a of the respective mechanism. The cam shaft is driven by bevel gears 22 thereon, engaging bevel gears 23 and 24 on a transverse shaft 25. At the left side of the machine this shaft is mounted for rotation and secured against end motion in suitable bearings in the fixed stripping mechanism frame 5. At the other end the shaft has a splined and slidable connection in the hub of bevel gear 24, this hub being revolubly mounted in a bearing secured to move with the movable stripping frame 5^a, so that the main driving connection for the movable stripping mechanism is not affected by adjustment for box width.

Cross shaft 25 is driven by a sprocket 26 thereon, a chain 27 and another sprocket 28 on a lower cross shaft 29 mounted in bearings in the pedestals 3. To take up chain slack an idler 30 is provided, mounted on an arm 31 fulcrumed at 32 and provided with an adjusting screw 33 bearing against a fixed frame part. Cross shaft 29 is driven by a worm gear 35 thereon engaging a worm 36 on the main drive shaft 37, arranged longitudinally of the machine and mounted in bearings 38. The main driving shaft may be driven in any suitable way, as by an electric motor, or as here shown, by a belt 40 running from any suitable countershaft to a free pulley 41 mounted on the main shaft and provided with a clutch 42 and a lever 43 for connecting and disconnecting the pulley to start and stop the machine.

Mounted on the base 1 is an exhaust pump 45 representing any suitable means for maintaining "suction" (low pressure) for the operation of suction feed devices later referred to. The pump is driven from the main shaft 37 by a belt 46. Near cross shaft 29 is a valve housing 47 containing valves 48 and 49 to control the feed and transfer (or applying) suction heads, later referred to. Each of these valves has a stem 50 connected to one arm of a bell crank 51. These cranks are

mounted on a shaft 52 carried by brackets 53 and are provided with rollers 54 running on the peripheries of cams 55 fixed on cross shaft 29. The valves are of any known or suitable construction to connect the respective suction heads, through pipe lines sufficiently identified below, to the pump or other exhaust apparatus, or to supply atmospheric pressure through the pipe lines to the suction heads, for the proper suction gripping and release of the strips or flies, as later fully explained. In the present particular arrangement of piping a tube 56 leads from each valve to one of two manifolds 57 and 58, from each of which one or more, (usually two) flexible tubes 59 and 60 respectively lead to each of the suction heads at the corresponding side of the machine, the provision of two tubes being to better equalize the suction effect throughout the length of the respective head.

At one end cross shaft 29 has a crank 61 connected by a pitman 62 to an arm 63 on a rock-shaft 64 mounted in bearings in pedestals 3. An elbowed arm 65 on this rock-shaft serves to reciprocate the box-feed mechanism, as hereafter explained.

At the gluing station G, Fig. 1, a glue pot 66 is mounted on frame members at each side of the machine. The gluing mechanisms (and also the applying mechanisms) may be duplicates, except for variations necessary to admit adjustment of the right-hand stripping mechanism. Each glue pot is long enough to accommodate rolls as long as the longest box to be handled by the machine. In each pot is a dipper roll 67 mounted in bearings 68 and provided outside the pot with a worm gear 69 engaging the helical thread of a long worm 70 on a transverse shaft 71 mounted in a bearing 72 in the fixed stripper frame and passing freely through a bearing 73 in the movable stripper frame. By this arrangement the adjustment of the movable frame is not interfered with, because in such adjustment, the corresponding dipper roll will simply be rotated with its shaft and worm gear, as the latter traverses the thread of the long worm while the movable frame is being shifted. The worm shaft is driven by a worm gear 74 thereon, engaging a worm 75 on a shaft 76 mounted in bearings in brackets 77 and driven by a pulley 78, and a belt 79 passing about a pulley 80 on the main drive shaft 37.

Also mounted in bearings in each glue trough is a glue roll 81 engaging the dipper roll 67 and driven from it by gears (not shown) or by friction.

A glue pad or stencil 82, usually a rubber strip carried by a bar 83 and slightly shorter than the inner longitudinal dimension of the box, is mounted for movement over the glue roll 81 to receive glue therefrom and then for movement within the box adjacent its side wall and for pressure upon the upper inner wall margin to apply glue thereto, as follows: The stencil supporting bar 83 is carried by an arm 84 pivoted at 85, on the free end of another arm 86, the hub of which is keyed on a rock shaft 87 running longitudinally through the respective stripping mechanism and mounted in bearings in the uprights 5 or 5a. Arm 84 has an extension 88 connected by an adjustable link 89 on the short arm 90 of a bell crank 91 mounted for oscillation on the rock shaft. The long depending arm 92 of the bell crank is connected by a link 93 to a short arm 94 on a longitudinal rock shaft 95. The rock shafts 87 and 95 perform functions in the strip-applying mechanism, and for this purpose shaft 87 is oscillated by an arm 87a (Fig. 7) having a roll 87b bearing on a cam 87c on shaft 21; and rock shaft 95 is oscillated by its arm 170 having a roll 171 bearing on a cam 172 which is fixed on shaft 21, as later referred to. The gluer arms 84 and 86 are curved in a longitudinal direction of the machine, as best shown in Figs. 1 and 4, and the arm 84 has its free end, which carries the stencil-supporting strip 83, located near the rearward end of a relatively long box B positioned for glue application, as in Fig. 1. This is because the feed mechanism in the present arrangement is designed to operate on the rear end of the box, which will always be in the same position, regardless of box length. Therefore when shorter boxes are handled, a shorter glue stencil and supporting strip are substituted for the one shown, and the end of arm 84 designed to receive the supporting strip will still be in proper position to support this shorter strip and move it to gluing position within the box.

Fig. 5 shows the glue stencil in retracted position. As a box is moved to gluing position, Fig. 1, the cam mechanism later described oscillates rock shaft 87 to move arm 86 toward the center of the machine. This movement carries the glue stencil across the face of the glue roll 81, receiving glue therefrom, and further movement of the arm brings the stencil down within the box adjacent the inner side wall margin. At about this time link 93 operated by rock shaft 95 and its cam, as also later explained, moves bell crank 91, which oscillates on shaft 87, and through link 89 and extension 88, arm 84 is moved to press the stencil against the upper inner side wall margin of the box B, Fig. 9, and apply glue stripes *g* thereto. The stencil is retracted laterally, and then upwardly as the box begins to move forward toward the strip applying station A, Fig. 1. These operations are, of course, performed concurrently by the two opposite gluing mechanisms.

At the applying station there is, for each

of the applying mechanisms, a strip magazine M. Each magazine includes an inner or front plate 100 secured to the inward ends of arms 102 mounted on a rock shaft 103 which is supported in bearings in upper portions of frame members 5 or 5ª. The front plate has a cross piece 104 on which struts 105 are mounted in guides 106 for longitudinal adjustment on the cross bar, this adjustment being fixed by screws 107. The struts 105 are slotted to receive screws 108 passing through lugs on upright corner plates 109 of L-section. By the described arrangement the magazine may be adjusted in an obvious way to properly fit a stack of the strips S of any reasonable dimensions, suitable for boxes within the adjustment range of the machine. These strips are arranged with their imperforate margins *m*, Fig. 10, toward the front (inward) magazine wall 100. The front edge of the stack (or the bottom strip therein) rests on a narrow front ledge 110, and the rear of the stack rests on a wider rear ledge or plate 111. In its lower position, as shown in Figs. 2 or 7, the magazine is supported by an adjustable stop consisting of a screw 112 provided with lock nut 113. The magazine is lifted in each cycle, to assist in strip separation and feed, by the following means: A bell crank 114 is arranged for oscillation on one end of rock shaft 103. One arm of this crank has an adjustable set screw 115 engaging one of the arms 102. The other arm of the bell crank has a cam roll 116 engaging the edge of a cam 117 mounted on rock shaft 118. This cam shaft is oscillated by an arm 119 thereon connected by a link 120 to an arm 121 on a rock shaft 122 which has another arm 123 provided with a cam roll 124 running on the periphery of a cam 125 on cam shaft 21 previously mentioned.

A strip feeding suction head 126 is arranged for oscillation in an arc about the axis of rock shaft 87, from a position below the inward margin of the strip stack where it receives a strip and removes it from the stack, to an inward angle of about 45° (more or less, Fig. 7) where the strip is transferred to an applying suction head. The feeding suction head 126 comprises a supporting bar 127 on which is secured the suction strip 128 which has a longitudinal air passage 129 connected to manifold 58 previously described, by one or more pipes 60, and transverse apertures communicating with the outer face of the suction strip. The supporting bar is carried by an arm 130 mounted for oscillation upon rock shaft 87 previously mentioned. This arm is oscillated by a link 131 having adjustable pivotal connection to the upper arm of a bell crank 132 mounted for oscillation at 133 and provided with a cam roll 134 engaging the periphery of a cam 135 on cam shaft 21. The arm is urged toward upward position and the cam roll at the same time held upon the cam by a spring 136 tensioned between a lug 137 on the arm and a spring support 138 connected to the frame. The feed suction head is checked in the proper upright position, Fig. 6, by an adjustable set screw 139 passing through a frame lug 140 and engaging arm 130.

The applying head 141 includes a suction face 142 formed by a row of radial perforations leading to the inward face of the head, these being connected to a longitudinal passage 144 which is connected by one or more of the pipes 59 to the manifold 57 previously mentioned. Inwardly or downwardly from the suction face is a pressing strip 150 of felt or rubber, which is positioned radially opposite the strip feed suction surface when the two heads are in strip transferring position, Fig. 7, while the suction face of the transferring or applying suction head 141 is located somewhat above the feed suction face. The transfer head is mounted on arms 152 which are provided with lugs 153 bored for a sliding fit on rods 154 secured in sleeves 155, these sleeves being keyed to rock-shaft 87 above mentioned. Springs 156 located about the rods 154 and compressed between the outer lugs 153 and abutments 157 on the rods urge the frame comprising arms 152 and the transfer head, radially outward. Each arm 152 also has a plunger socket 160 in which a plunger 161 is mounted upon a spring 162 which is of substantially greater strength than the spring 156 just mentioned. The plunger has a stem 163 passing through the spring 162 and through the bottom of the socket where it is provided with a stop 164 to limit outward movement of the plunger. When the transfer or applying frame moves to lower position (or strip applying position, Fig. 8) the outer end of plunger 161 is positioned close to a roll 166 mounted on a short arm 167 of rock-shaft 95 previously mentioned in describing the gluing mechanism and which controls the movement of the glue stencil arm 84 thereof. This rock-shaft 95 has a long arm 170 provided with a cam roll 171 running on the periphery of a cam 172 on cam shaft 21. When the plunger comes into cooperative relation with its roll 166, the latter is in retracted position. Thereafter cam 172 operates the rock-shaft and the roll to engage plunger 161, and first move the frame radially toward the center of its rock-shaft, to apply the inward imperforate margin of the lace strip or fly to the glued margin of the box wall, and then by further movement the plunger is moved inward in its socket with accompanying compression of the spring to firmly press the strip in position and insure its adhesive engagement with the box.

Thereafter the roller is retracted, permitting outward movement of the applying head with its frame which is then retracted upward by oscillation of rock shaft 87.

To assist in the separation of the individual strips from the bottom of the stack, or to make such separation positive, separating means is provided, as follows: A blade 180 is pivotally mounted on the ends of arms 181 which are in turn mounted on a rock shaft 182 located in bearings on the magazine front plate 100. The rock shaft also carries an arm 183 provided with an adjustable stop screw 184 engaging the magazine front plate to limit inward movement of the blade. The blade is provided with an arm 185 having a cam roller 186 bearing on a cam surface 187 formed on an extension of one of the magazine supporting arms 102. A spring 188 is also tensioned between arms 185 and 183 to maintain the cam roller in engagement with its cam. Rock-shaft 182 is oscillated by a rod 190 passing through a pivoted sleeve 191 on an arm 192 connected to the rock-shaft. A spring 193 is located between the sleeve and a stop 194 on the inward end of the rod. The outer end of the rod is connected to an arm 195 which is fixed on rock-shaft 118 above referred to in describing the magazine lifting mechanism.

Each box glued by the gluing mechanism, as above described, is advanced by the feed mechanism and properly positioned at the applying station A, Fig. 1, and at the same time a fresh box is positioned at the gluing station for gluing operations performed simultaneously with the strip applying operation to be performed at the applying station.

Figs. 2 and 8 show the applying mechanism in strip applying position. At this time the feed suction head 126 is in upward position and the magazine has been lowered by the described mechanism to bring the forward imperforate margin of the lowermost strip in the stack in contact with the suction face. Suction is then applied to grip the strip; the magazine is raised, pulling the forward edge of the strip out from above the shallow supporting ledge 10, as in Fig. 6. The separating blade is then moved inward, (toward the stack) by the above described mechanism, and in this movement its cam roll 186 and cam 187 direct it to move close to the supporting flange 110 or between the forward edge of the freed strip and the next superposed strip of the stack. As the separating blade approaches its inward position, the cam roller runs upon a part of the cam which is located inwardly from an arc struck from the center of shaft 182; thus the cam roller and arm 185 are retracted by spring 188 while the inward end of the separating blade is moved outward to positively separate the bottom strip from the one next above it. This is important because these strips or flies are usually of perforated or "lace" paper, the irregularities of which tend to stick together and this would often result in double feeding or other difficulties if suitable, positive separating means were not provided. During the described operations the applying head has been moved first laterally inward (toward the machine center) and its frame has then begun to move upward toward the position of Fig. 7. The feed frame 130, 127 commences to move inward or downward carrying with it the fly strip, the rear edge of which is now pulled out from the rear supporting ledge 111. The strip is thus carried down by the feed head between the latter and the applying head, these heads being finally positioned as shown in Fig. 7. While suction is still maintained in the feed head, suction is applied in the applying head to grasp the outer imperforate face of the fly strip. Suction is then cut off from the feed head and the strip is secured to the applying head with its inner (now downward) margin opposite the pressing strip 150 thereon. The applying head now moves downward with the head in inward position, carrying the imperforate margin of the fly strip down opposite the edge stripe g on the box wall; the head is now moved outward (in relation to the box wall) to apply and press the strip in position, the head is then retracted, the box is advanced, and the cycle is repeated indefinitely, with one box being glued at the glue station while another has the strips or flies applied to it at the applying station.

Any known or suitable mechanism may be provided for properly feeding and positioning the boxes at the stations, and discharging the completed boxes. The mechanism shown is especially suitable and is preferred in many cases. It comprises a main feed bar 200 mounted for reciprocation below the box bottoms in a guide 201. Secured to the bar are (in the present specific example) three rock bars 202, 203 and 204; but more may, of course, be provided if the feed-run is longer. The rock bars are substantially similar, but conveniently, as shown, the forward two of them are directed forwardly from their pivot connections 205 to the main bar while the other one, 204, is directed rearwardly. Each of the rock bars has on its free end a bracket in which an upright push bar 206 is mounted for a vertical adjustment, depending on the depth of the box part to be fed. At the upper end of each push bar is a blade formation 207 to engage the rear end wall of the box near the bottom thereof. For at least one, and usually for the two forward rock bars, as shown, there is toggle mechanism, consisting of the connected toggle links 208, the upper one of which is pivoted to the rock bar near its fulcrum

point and the lower one is pivoted to a bracket secured to the main feed bar. The central pivot of each toggle linkage is connected to a long link 210. The rear rock bar has a single link 211 pivotally connected to it near its fulcrum and also connected to the long link 210. The rock bars have toes 212 co-operating with stop members 213 on brackets 214 to limit downward movement of the long ends of the bars. The toggle and link mechanism co-operates with a forward adjustable stop 215, and a rear adjustable stop 216, these being connected to the main bar guide 201. One of the brackets 214 is connected by an adjustable link 220 to the rock arm 65 previously mentioned, for reciprocation of the main feed bar 200 in synchronism with the stripping mechanism, this motion being derived from cross shaft 29 as previously fully explained.

The boxes are supplied to the forward or feed end of the guide channel consisting of the side rails 12 and bottom rails 13, by hand or by any suitable conveyor. When the main feed bar 200 moves forward, the toggles are "sprung" forward to drop the rock bars 202, 203 and 204, and retract the blades 207 of the push bars below the box bottoms. The main bar and the push bars are moved forward in this condition, free from the boxes. At the forward end of the stroke the center point of the forward toggle linkage 208 strikes the forward stop 215. This operates the toggle links 208 and the single link 211 to elevate all of the push blades simultaneously. The toggles are also sprung slightly beyond vertical position, as shown in Fig. 1, and are so held by the adjustable stop screw 225 on one of the brackets 214, which prevents further collapse of the toggles and causes them to retain the push blades in elevated position. Each blade then confronts the rear end of a box and in the advance of the main bar (toward the right, Figs. 1 and 3), three boxes are simultaneously advanced, one being moved to gluing position, one being moved from gluing to applying position, and another being moved away from the applying position. At the end of this movement the rear end of link 210 strikes the rear stop 216, the toggles are sprung to "collapsed" position, as shown in Fig. 4, thus retracting the push bars and blades ready for another return stroke. The completed boxes engage each other in a row in the discharge stretch of the guide channel formed by the side and bottom rails, and are thus advanced to any convenient point of disposal. The applied strips or laces stand upright and may be turned down by hand, or suitable mechanism (not shown) may be provided for this purpose, if desired.

I claim:—

1. A machine of the class described, comprising means for advancing and positioning successive articles for strip application, means for applying strip-securing adhesive to the articles, and subsequently acting means for removing individual strips from a magazine and applying a marginal portion of each strip to one of the successively positioned articles.

2. A machine of the class described, comprising means for advancing successive articles and positioning them in turn at a gluing and a strip applying station, means at the gluing station for applying glue stripes to a wall margin of the articles, and means at the applying station for removing individual strips from a strip stack and applying a margin of each strip to a glued surface of an article.

3. A machine of the class described, comprising means for advancing successive articles and positioning them in turn at a gluing and strip applying station, means at the gluing station for applying glue stripes to opposite wall margins of the articles, and means at the applying station for removing individual strips from strip stacks and applying margins of the strips to the glued surfaces of the articles.

4. A machine of the class described, comprising means for advancing and positioning successive box parts for fly application, means for applying glue to opposite inner wall margins of the boxes, and subsequently acting means for removing individual fly strips from stacks and applying margins of the strips to the glued box margins.

5. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, means at the gluing station for applying a glue stripe to a box wall margin, and at the applying station a magazine for a stack of fly strips, and means for selecting and removing successive individual strips from the magazine, and applying a margin of each strip to the glued surface of a box part.

6. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, means at the gluing station for applying a glue stripe to a box wall margin, and at the applying station a magazine for a stack of fly strips, strip feed means for removing successive individual strips from the magazine, and strip applying means for receiving a strip from the feed means and applying a margin of the strip to a glued box surface.

7. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, means at the gluing

station for applying glue stripes to opposite box-wall margins, and at the applying station magazines for stacks of fly strips, and means for selecting and removing successive individual strips from the magazines, and applying a margin of each strip to one of the glued box surfaces.

8. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, means at the gluing station for applying glue stripes to opposite box-wall margins, and at the applying station magazines for stacks of fly strips, strip feed means for removing successive individual strips from the magazines, and strip applying means for receiving the strips from the feed means and applying margins of the strips to the glued box surfaces.

9. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, gluing mechanism at the gluing station comprising a glue stencil, a glue supply, and means for moving the stencil over the glue supply and applying it to an inner box wall margin, and at the applying station, strip supplying and applying mechanism including a magazine for a stack of fly strips, strip feed means for removing successive strips from the magazine, and applying means devised to receive a strip from the feed means and apply a strip margin to the glued box surface.

10. A machine of the class described, comprising a feed channel, means for advancing successive box parts through the channel and positioning them in turn at a gluing and a strip applying station, opposite gluing mechanisms at the gluing station, each comprising a glue stencil, a glue supply, and means for moving the stencil over the glue supply and applying it to one of two opposite inner box wall margins, and at the applying station, opposite strip supplying and applying mechanisms each including a magazine for a stack of fly strips, strip feed means for removing successive strips from the magazine, and applying means devised to receive a strip from the feed means and apply a strip margin to one of the glued box surfaces.

11. A mechansm of the class described, in combination with box feeding and glue applying means, strip applying mechanism comprising a strip stack, a strip feeder arranged to remove successive strips from the magazine and carry them to a transferring position, and applying means arranged to receive strips from the feed means at the transferring position and move the successive strips toward boxes and apply strip margins to glued surfaces of the boxes.

12. A mechanism of the class described, in combination with box feeding and glue applying means, strip-applying mechanism comprising a strip stack, a strip feeder including a strip engaging suction head arranged to remove successive strips from the magazine and carry them to a transferring position, and applying means including a strip engaging suction head arranged to receive the strips from the feed means at the transferring position and move the successive strips toward boxes and apply strip margins to glued surfaces of the boxes.

13. A mechanism of the class described, in combination with box feeding and glue applying means, strip applying mechanism comprising a strip stack, a strip feeder including a strip engaging suction head arranged to remove successive strips from the magazine and carry them to a transferring position, and applying means including a strip engaging suction head and a strip pressing member arranged to receive the strips from the feed means at the transferring position and move the successive strips toward boxes and apply strip margins to glued surfaces of the boxes.

14. A mechanism of the class described, in combination with box feeding and glue applying means, strip applying mechanism comprising a strip stack, a strip feeder arranged to remove successive strips from the magazine and carry them to a transferring position, means co-operating with the feed means to separate the successive strips from the stack, and applying means arranged to receive strips from the feed means at the transferring position and move the successive strips toward boxes and apply strip margins to glued surfaces of the boxes.

15. In mechanism of the class described, in combination with box feeding and glue applying means, strip feeding and applying mechanism comprising a strip magazine, an oscillating strip feed suction head, a frame arranged to oscillate from the approximate axis of movement of the feed suction head, a transfer and applying suction head mounted for radial movement on the frame, and means for moving the feed suction head and said frame to cause the feed head to remove a strip from the magazine and carry it to a transferring position where the applying head is simultaneously positioned to receive the strip, and for then moving the frame and transfer head to position the strip for application to a glued box surface.

16. In mechanism of the class described, in combination with box feeding and glue applying means, strip feeding and applying mechanism comprising a strip magazine, an oscillating strip feed suction head, a frame arranged to oscillate from the approximate axis of movement of the feed suction head, a transfer and applying suction head mounted for radial movement on the frame, and

means for moving the feed suction head and said frame to cause the feed head to remove a strip from the magazine and carry it to a transferring position where the applying head is simultaneously positioned to receive the strip, and for then moving the frame and transfer head to position the strip for application to a glued box surface, and means for then moving the transfer and appling head radially on its frame to apply and press the strip in position on the box wall.

17. In mechanism of the class described, in combination with box gluing and strip applying mechanism, box feed mechanism comprising a reciprocating bar, a plurality of box pushers thereon, and mean for raising the pushers during feed movement of the bar and for lowering them during bar return movement.

18. In mechanism of the class described, in combination with box gluing and strip applying mechanism, box feed mechanism comprising a reciprocating bar, a plurality of rock arms thereon, link mechanism for raising and lowering the rock arms, a push bar adjustably connected to each rock arm, and fixed means co-operating with said link mechanism to effect the elevation of the rock arms and push bars prior to a feed stroke and depression of the rock arms and push bar prior to a return stroke of the main feed bar.

19. Mechanism of the class described, comprising a feed channel, means for moving articles therethrough, stripping mechanism in fixed position at one side of the channel, stripping mechanism movably mounted at the other side of the channel, and means for moving the adjustable stripping mechanism toward and from the fixed mechanism to position said mechanism for action on articles of different widths.

20. Mechanism of the class described, comprising a feed channel, means for moving articles therethrough, stripping mechanism in fixed position at one side of the channel, stripping mechanism movably mounted at the other side of the channel, and means for moving the adjustable stripping mechanism toward and from the fixed mechanism to position said mechanism for action on articles of different widths and simultaneously adjust the channel in accordance with the article width.

21. Mechanism of the class described, comprising a frame, stripping mechanism fixed thereon, opposite adjustable stripping mechanism, means for moving the adjustable mechanism toward and from the fixed mechanism, fixed article guides, and adjustable article guides supported by the adjustable mechanism whereby adjustment of said mechanism simultaneously positions the respective mechanisms for action on boxes of different widths and adjusts a guide channel comprising the fixed and movable guide members for a box of corresponding width.

22. Mechanism of the class described, comprising a frame, fixed stripping mechanism thereon, adjustable stripping mechanism thereon, a fixed article side guide bar, a laterally fixed article supporting guide bar, means supporting the latter bar for vertical adjustment, a movable article side guide bar, and another article supporting guide bar mounted for lateral and vertical adjustment, the movable side and supporting guide bars being arranged to move with the movable stripping mechanism to effect their lateral adjustment.

Signed at New York city, in the county of New York and State of New York this 8th day of June, A. D. 1926.

HARRY BRIDGMAN.