Nov. 14, 1933. F. M. JOSLIN 1,935,031

GLUING MACHINE

Filed Feb. 11, 1930 4 Sheets-Sheet 1

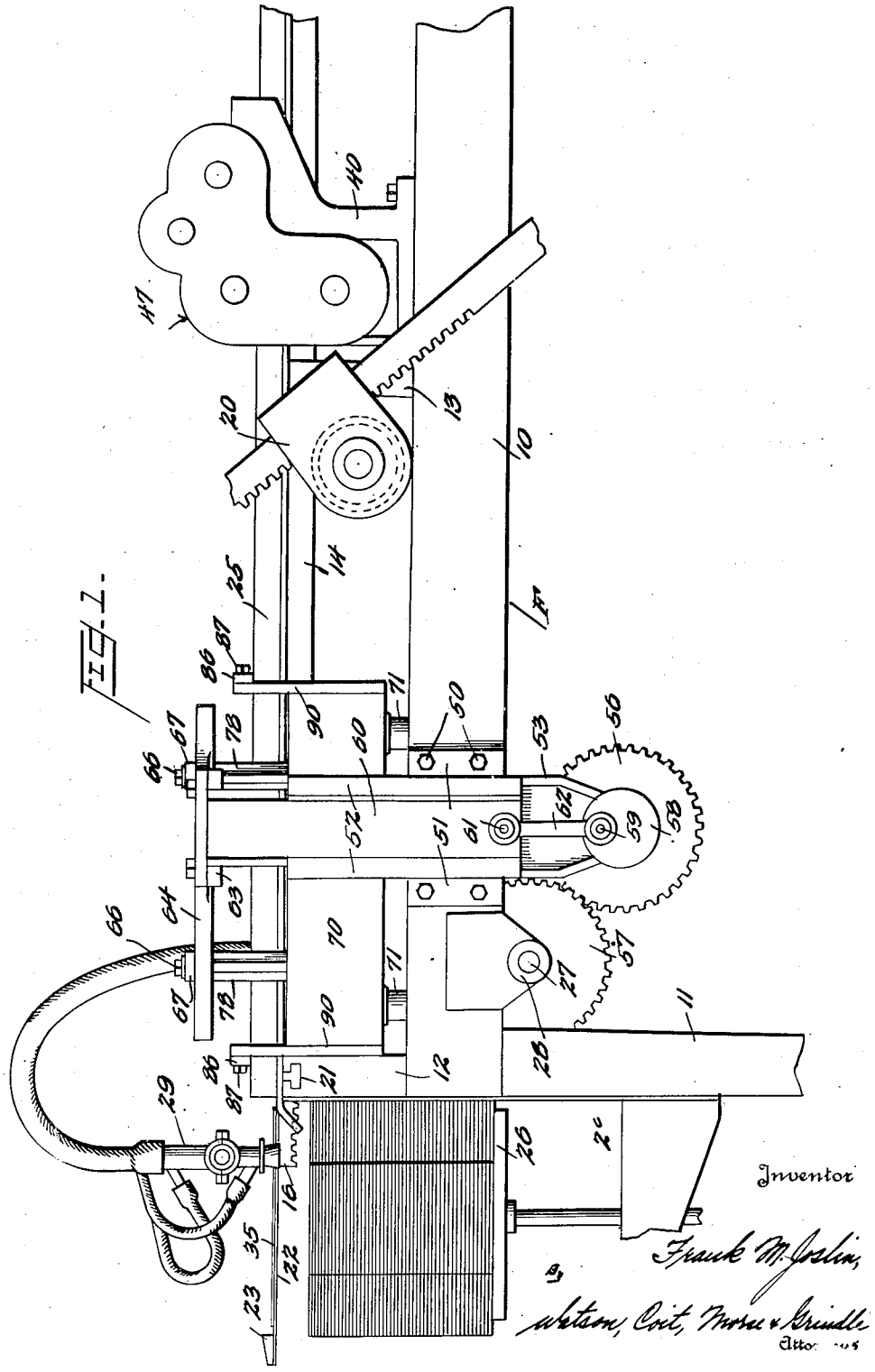


FIG. 1.

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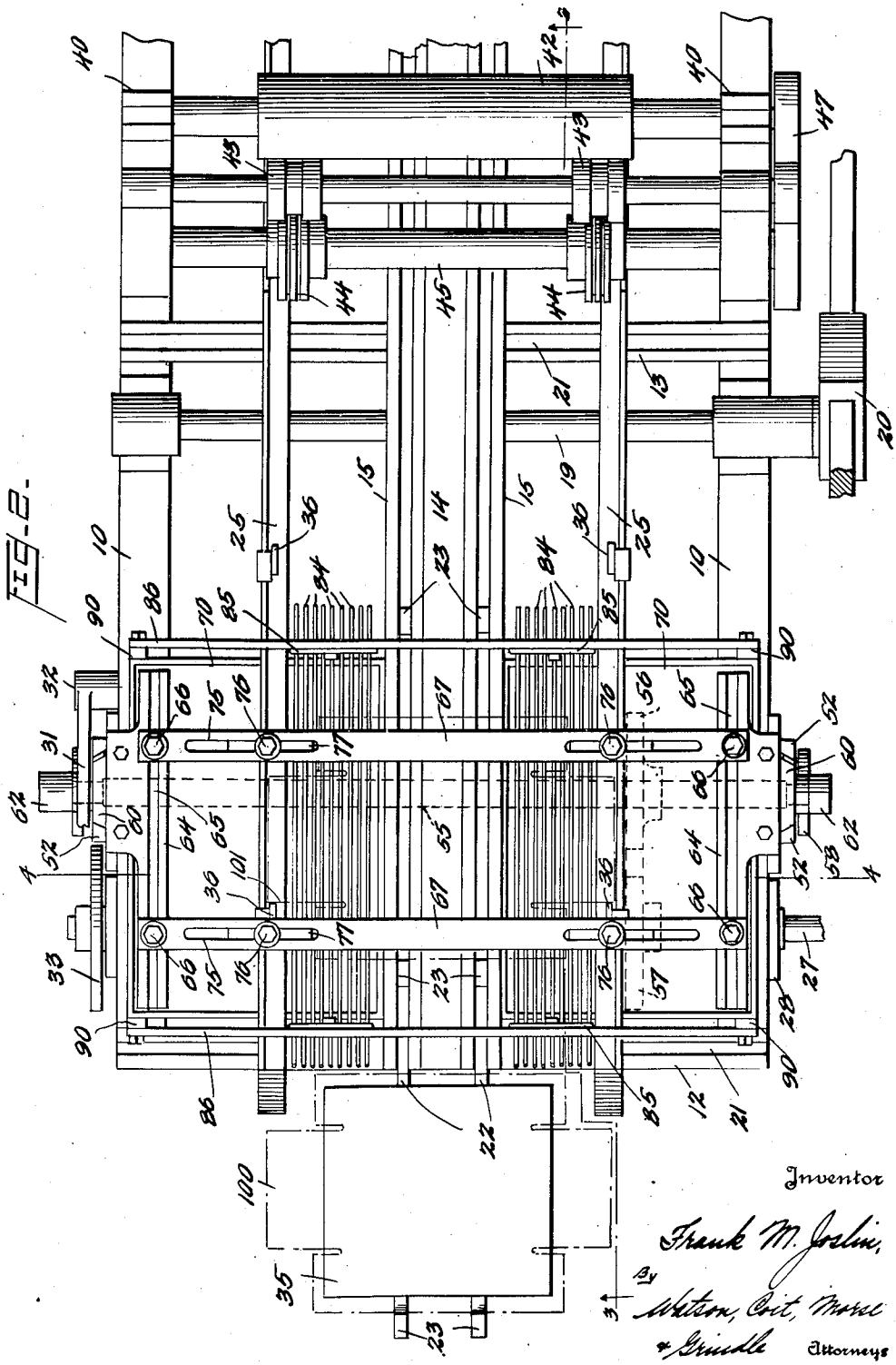
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GLUING MACHINE

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FIG-2.



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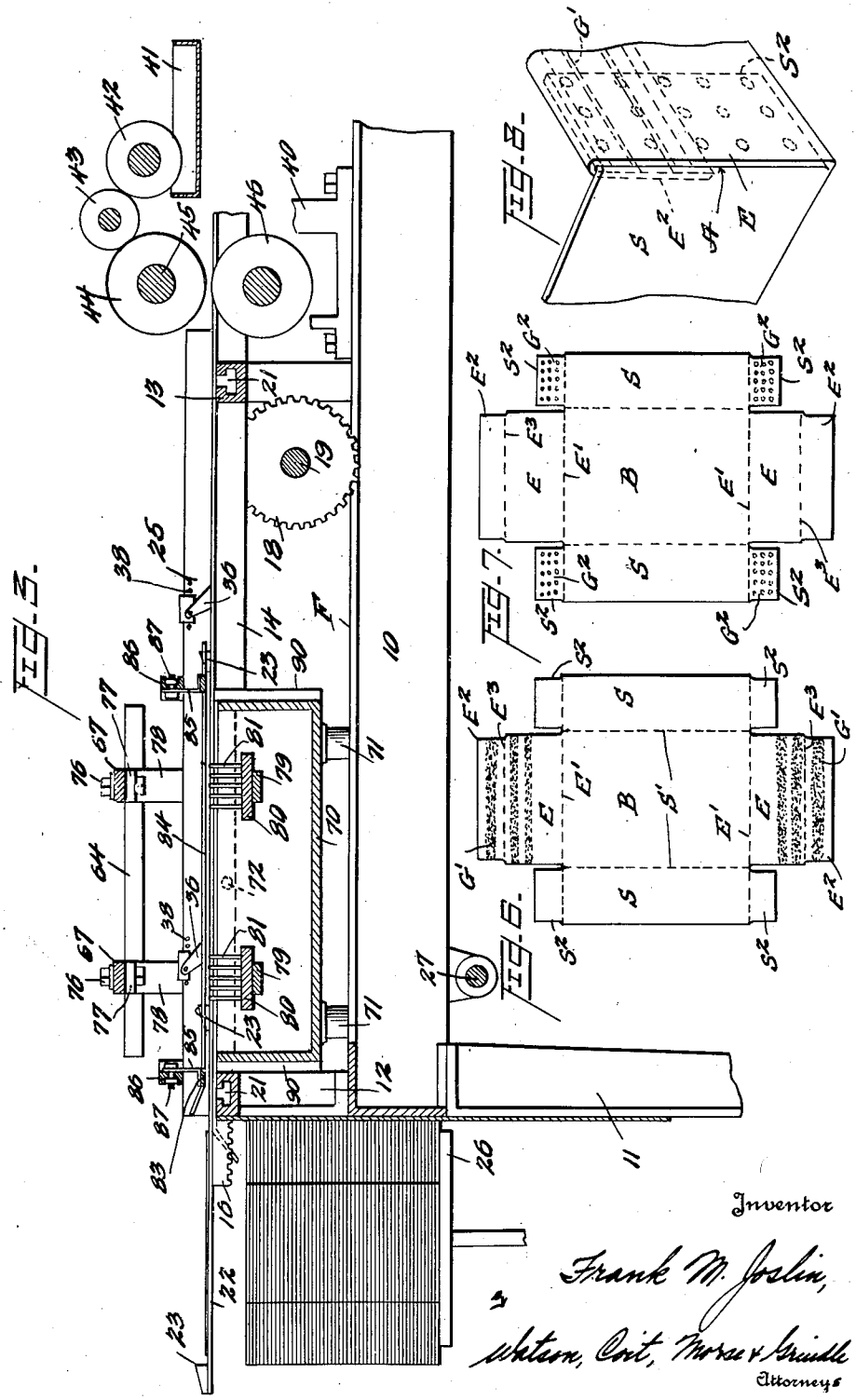
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Nov. 14, 1933. F. M. JOSLIN 1,935,031

GLUING MACHINE

Filed Feb. 11, 1930 4 Sheets-Sheet 3



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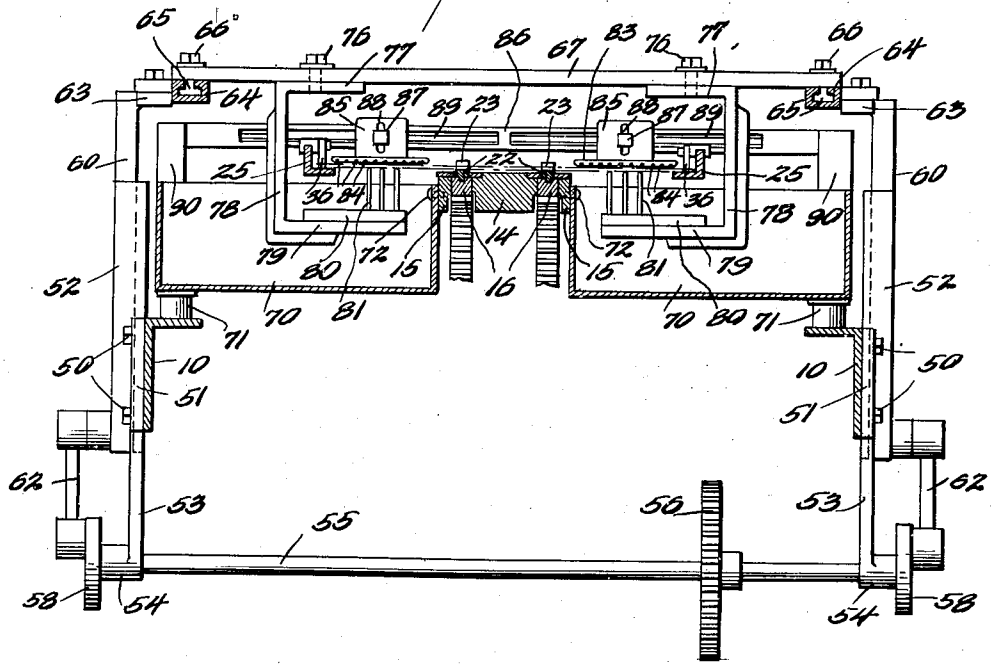
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Nov. 14, 1933. F. M. JOSLIN 1,935,031

GLUING MACHINE

Filed Feb. 11, 1930 4 Sheets-Sheet 4

FIG. 4.



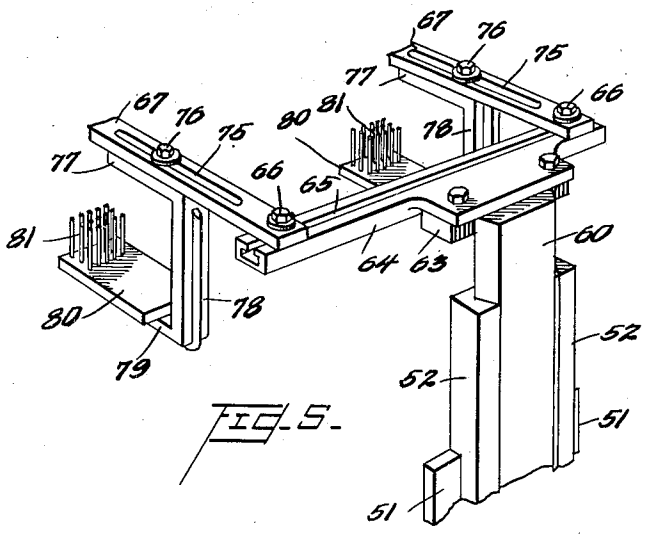


FIG. 5.

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UNITED STATES PATENT OFFICE

1,935,031

GLUING MACHINE

Frank M. Joslin, Amsterdam, N. Y.

Application February 11, 1930. Serial No. 427,610

11 Claims. (Cl. 91—18)

This invention relates to gluing machines and more particularly to mechanism employed in connection with box forming machines, for applying glue or other adhesive material to portions of the box blanks which are to be secured together at a later stage of the box forming operation. One example of the type of box forming machine to which the present device may be applied is shown in my copending application, Serial No. 354,353, filed April 11, 1929.

An object of the invention is to provide such a machine which includes mechanism for applying glue or other adhesive to portions of both sides of the blanks, during their passage through the machine.

Another object is the provision of both reciprocating and rotary adhesive applying members in a machine of this type, the rotary member being adapted to apply the adhesive to portions of a blank which extend entirely across the blank in the direction of its travel, and the reciprocating member being adapted to apply the adhesive to portions which are separated in the direction of travel by areas to which no adhesive is to be applied.

Other objects include the provision of novel means of adjustment of certain of the glue applying elements for adapting them to operate upon blanks of various sizes, of novel driving means for said mechanism, and other features of novelty which will be apparent from the following specification when read in connection with the accompanying drawings in which one embodiment of my invention is illustrated by way of example.

In the drawings,

Figure 1 is a side elevation of a portion of a box making machine embodying the principles of my invention;

Figure 2 is a plan view of the same portion of the machine;

Figure 3 is a vertical, longitudinal, cross-sectional view taken on line 3—3 of Figure 2;

Figure 4 is a vertical, transverse, cross-sectional view taken on line 4—4 of Figure 2;

Figure 5 is a fragmentary view in perspective of one side of the gluing mechanism;

Figure 6 is a plan view of the top of one of the blanks after having glue applied to the end flaps;

Figure 7 is a plan view of the underside of a blank showing the glue applied to the corner flaps; and

Figure 8 is a fragmentary view of one corner of a completed box, showing the final positions of the glued portions.

For the purpose of convenient disclosure of my invention, the gluing mechanisms are illustrated in the drawings and described herein as being applied to a box making machine which is substantially the same as the one disclosed in my above mentioned copending application. The machine is adapted to operate upon previously prepared box blanks of the general form illustrated in Figures 6 and 7 of the accompanying drawings. The body portion B of the blanks and the side portions S are adapted to be folded perpendicularly to the body portion along the lines S^1. At each end of these side portions S are formed the corner flaps S^2 which, during the folding process are adapted to be bent inwardly at right angles to the perpendicular side portions S^1. End flaps E are formed at each end of the body portion B and are adapted to be folded along the lines E^1 perpendicularly to the body portion. When thus folded, the main portion of the end flaps E are positioned against the outer sides of the corner flaps S^2, and during the final folding operation the projecting portions E^2 of the end flaps E are folded over these corner flaps S^2 along the lines E^3. During one of the glue applying operations the adhesive is applied to the body portions of the end flaps E and also to the projecting portions E^2 in narrow strips G^3. Since these glued portions extend entirely across the body of the blank outwardly of the corner flaps S^2, they may be applied by means of a rotary gluer.

Boxes of this kind which have heretofore been formed in similar machines employing a rotary glue applying mechanism for applying the adhesive to those portions of the end flaps E which lie outwardly of the corner flaps S^2 of the blank, have been generally unsatisfactory due to the fact that, in assembled position such as shown in Figure 8, the unglued portion of the end flap, having no means for folding it firmly against the folded corner flap S^2, is inclined to bulge outwardly from the body of the box at point A. To meet this difficulty, it is proposed to combine with this rotary adhesive applying mechanism, reciprocating mechanism for applying adhesive to the surfaces or areas G^2 of the corner flaps S^2 upon the opposite surface of the blank from that to which the adhesive G^1 is applied to the end flaps. Since the areas G^2, to which the glue is to be applied by means of this last named device, are separated in the direction of movement of the blank through the machine by the body portion of the end flaps E, a reciprocating mechanism is found to be the most convenient for applying

adhesive to these corner flaps. As clearly shown in Figure 8, the adhesive applied to the corner flaps S^2 will cause the lower part of the body portion of the end flaps E to adhere firmly to these corner flaps and prevent bulging at the point A. It is obvious that, if desired, the adhesive need only be applied to the lower portions of the corner flaps S^2 since the glued portions G^1 of the end flaps will adhere to the upper portion of the corner flaps S^2 without the application of additional adhesive. The blanks may be previously scored along the lines along which they are to be folded or they may be creased and folded by mechanism applied to the box making machine.

Referring now to the machine itself, the frame thereof is designated generally by the letter F and comprises the side beams 10 and legs 11, only two of which are shown in the drawings, it being understood that the right hand end of the frame F is supported by similar legs and is designed to carry suitable apparatus for forming the boxes from the blanks to which adhesive is applied by the mechanisms to be described. Upon the left hand end of the frame F is the end support 12 and near the center of the frame is the similar support 13. A similar support may be provided at the right hand end of the frame. Mounted upon these supports centrally of the frame F is the member 14. Spaced from each side of this central member 14 are the side strips 15. Rack bars 16 are disposed between the side strips 15 and the central member 14 for reciprocation longitudinally thereof. These rack bars are adapted to be driven by the gears 18 mounted upon shaft 19 which is in turn operatively connected by means of the drive mechanism indicated generally by the numeral 20 to the main driving mechanism (not shown) disposed at the right hand end of the machine. A pair of sheet feeding members 22 are rigidly secured to the racks 16 to reciprocate therewith and are each provided at spaced intervals with the upwardly projecting lugs 23, the purpose of which will be later described. Mounted upon the supporting members 12 and 13 for lateral adjustment upon either side of the sheet feeding mechanism are the angle bars 25, the lower flanges of which cooperate with the intermediate members 14 and 15 to form a horizontal guideway for the blanks as they pass through the machine. The vertical flanges of the angle bars 25 form side guides for this guideway. The bars 25 are adjustably secured to the supports 12 and 13 by means of bolts which are adapted to enter the slot 21 in the top surface of these supports.

At the left hand end of the machine is disposed the vertically movable table 26 which is adapted to be elevated by suitable mechanism operatively connected to the power shaft 27 rotating in the bearings 28 attached to the side members 10 of the frame of the machine. This shaft is connected by any suitable power transmitting mechanism to the main source of power at the right hand end of the machine. This table 26 is adapted to elevate a pile of blanks as the individual blanks are taken from the top of the pile by the vertically reciprocating suction device designated generally by the numeral 29. This device is similar in all respects with the one shown and described in my above mentioned copending application and is adapted to be reciprocated by means of mechanism including arm 31 fulcrumed at 32 and adapted to be given a vertical swinging movement by means of the cam 33 which is mounted upon one end of the power shaft 27.

Upon the left hand end of the feeding mechanism comprising rack bars 16, strips 22, and lugs 23 is disposed the rectangular platform 35. Upon each reciprocation of the suction lifting device 29, it raises the top blank of the pile and the left hand end of the feeding mechanism including the platform 35 projects beneath the blank thus raised, and the lugs 23 engage the rear edge thereof. On the next right hand oscillation of the feeding device, the blank designated by the numeral 100 is brought to the position 101 shown in dotted lines in Figure 2. Attached to the vertical flanges of the side bars 25 are the pivoted dogs 36 beneath which the extreme edges of the blanks are adapted to pass. When the blanks are brought to the position 101 their rear edges will have passed the dogs 36 which will fall to a position behind the edges of said blanks and retain them at this point during the next rearward movement of the feeding device. During this rearward movement, the next pair of lugs 23 will pass beneath the blanks occupying position 101, and upon the next upward movement of the feeding device these lugs will carry the blanks to another position further along toward the right hand end of the machine where they will be again held by similar dogs 36. As many of these stations may be provided as are necessary to transfer the blanks from one end of the machine to the other. The dogs 36 may be adjustably secured to the side bar 25 by means of fastening elements which may be selectively inserted in the holes 38.

Carried by the supports 40 disposed upon the side bars 10 of the frame F near the longitudinal center of the machine is the rotary gluing mechanism which comprises the glue pan 41, the cylinder 42 which is adapted to transfer the adhesive material from the pan to the rollers 43 from which it is in turn transferred to the glue applying rollers 44 mounted for lateral adjustment upon the shaft 45. Disposed beneath the rollers 44 are the supporting rollers 46. These rollers 44 and 46 may be power driven and the blanks are fed between them on their way to the folding mechanism. The glue rollers 44 are so spaced and formed as to apply adhesive to the portions G^1 of the blanks shown in Figure 6. The cylinder 42 and the rollers 43, 44, and 46 are caused to rotate in unison by means of the associated gearing 47.

In order to apply the adhesive to the portions G^2 upon the underside of the corner flaps S^2 the following mechanism is provided. Directly beneath the station indicated by the numeral 101 are positioned on either side of the machine the glue tanks 70 which are adapted to rest upon the pedestals 71 carried by the side frames 10. The inner walls of the glue tanks 70 are secured to the strips 15 by means of the fastening elements 72. Secured by means of the bolts 50 to the outer sides of the side members 10 are the brackets 51 which are formed with vertical guide portions 52 and each of which is provided with a downwardly projecting bearing member 53. Disposed for rotation in the bearings 54 formed at the lower ends of the portions 53 is the shaft 55 which carries a gear 56 which is adapted to mesh with the gear 57 mounted upon power shaft 27. Upon the extreme ends of the shaft 55 are mounted the eccentric cranks 58 which carry pins 59. Between the guides 52 are positioned the vertically reciprocating members 60 which carry at their lower ends the pins 61. Operatively connecting the pins 59 and 61 are the links 62. Upon an en-

larged extension 63 at the upper end of each of the members 60 is fastened a longitudinally extending arm 64 which is slotted and grooved as at 65 for the reception of fastening members 66 for the purpose of adjustably securing to these arms 64 the cross bars 67 which extend from one side of the machine to the other. These bars 67 are provided with slots 75 through which are adapted to extend the bolts or other fastening elements 76. To the lower ends of these bolts 76 are secured the horizontal upper arms 77 of the downwardly extending brackets 78. Upon the lower ends of these brackets 78 are formed the horizontal arms 79 which are adapted to extend below the surface of the adhesive material in the tanks 70. Secured to the upper surface of these arms 79, by riveting or by any other suitable means, are the plates 80 into which are set the lower ends of the glue applying pins 81. Each plate 80 carries as many of these pins 81 as may be necessary to apply sufficient adhesive to the areas G^2 on the underside of the blanks. It will be readily apparent that upon each descending movement of the members 60 and its associated supports the glue pins 81 will be entirely submerged in the supply of adhesive in the tanks 70 and upon the next upward movement of the mechanism, the head of each of the pins 80 will raise a small supply of the adhesive material and apply it to the underside of the blank as it lies upon the guideway in the position designated 101. The glue pins 81 are adjusted to operate within the space between the longitudinal members 15 and the side bars 25.

Arranged above this space or opening between the members 15 and 25 are upper guiding devices 83, each of which comprises a series of horizontally spaced, slender, elongated rods 84 which may be of circular or rectangular cross-section as desired. These rods are carried by the brackets 85 to which they may be secured by soldering or in any suitable manner. These brackets are adjustably secured to the cross bars 86 by means of the fastening members 87 which are adapted to pass through the slots 88 and 89 in the brackets and corresponding bars respectively. Standards 90 are arranged on each side of the machine for supporting the outer ends of the cross bars 86. This upper guide 83 is not only adapted to prevent bulging of the blank during its passage along the guideway but also forms a backing-up device for the corner flaps S^2 of the blank as the glue is being applied to them by means of the fingers 81.

The word glue as used in this specification and in the subjoined claims is intended to include any suitable adhesive material.

The operation of the device described will be readily apparent. A pile of blanks are placed upon the table 26 and the topmost one is lifted by a suction device 29 so that the reciprocating platform 35 carried by the feed mechanism 16 may pass under the blank until the lugs 23 are in position to engage the rear edge thereof. Upon the next forward movement of the horizontal feed racks the blank is carried to a position 101 where it is retained by the dogs 36. While the feeding mechanism is moving rearwardly to engage the next blank the reciprocating glue applying mechanism is raised and the glue is applied to the portions G^2 of the corner flaps S^2. When the glue applying mechanism descends the reciprocating horizontal blank feeding device again moves forwardly bringing another blank to the position designated 101 and carrying the preceding blank to the corner flaps of which the glue has been applied forwardly to the next station. From this point the blank is carried by the rollers 44 and 46 which apply adhesive to the portions G^1 of the end flap E and extension E^2. From this point it is carried toward the right hand end of the machine where it may be folded by any suitable mechanism.

It will thus be seen that by means of the mechanism just described there is provided a novel machine which is adapted to apply the adhesive material to portions of a blank on opposite surfaces thereof and which is adapted to be employed in connection with various types and sizes of blanks, by means of the wide adjustability of each of the adhesive applying elements in all directions. It will be readily understood by those skilled in the art that many changes and modifications can be made in the embodiment of my invention which has just been described without departing from the spirit of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a box making machine, in combination, a plurality of laterally spaced strips forming a guideway for blanks, a reciprocating blank feeding member adapted to move said blanks by intermittent stages along said guideway, side guides for said blanks having retaining means secured thereto at intervals for preventing backward movement of said blanks during return movement of said feeding member, a pair of reciprocating adhesive applying members disposed at a point where a blank is held by one of said retaining means, and timed so as to operate to apply adhesive to said blank during said return movement of the reciprocating feeding member.

2. In a box making machine, in combination, a plurality of laterally spaced strips forming a guideway for blanks, a reciprocating blank feeding member adapted to move said blanks by intermittent stages along said guideway, laterally adjustable side guides for said blanks having pivoted dogs adjustably attached thereto at predetermined intervals for preventing backward movement of said blanks during return movement of said feeding member, a pair of laterally and longitudinally adjustable reciprocating adhesive applying members disposed at a point where a blank is detained by one of said dogs and timed so as to operate to apply adhesive to said blank during the return movement of said reciprocating member.

3. In a box making machine comprising a guideway along which blanks are fed by intermittent stages, a vertically reciprocating glue applying member arranged beneath a point on said guideway where said blanks are temporarily detained and an adjustable backing strip disposed above said member and beneath which said blanks pass, said guideway being provided with an opening through which said member is adapted to reciprocate.

4. In a box making machine comprising a guideway along which blanks are fed by intermittent stages, a vertically reciprocating glue applying member arranged beneath a point on said guideway where said blanks are temporarily detained and a laterally and vertically adjustable group of parallel elongated rods forming a backing strip and top guide disposed above said member and beneath which said blanks pass, said guideway being provided with an opening

through which said member is adapted to reciprocate.

5. In an adhesive applying machine, in combination, a horizontal blank support, an adhesive container disposed beneath said support, a vertically reciprocating member slidingly mounted at each side of the machine and each having a horizontal arm secured to its upper end disposed longitudinally of the machine, a pair of bars extending across the machine above said blank support and having their ends supported by said arms and adjustable longitudinally thereof, a pair of downwardly extending brackets laterally adjustably secured to each of said bars and having horizontally disposed plates secured at their lower ends, a plurality of vertically extending pins carried by each of said plates, and adapted, upon each reciprocation of said members, to lift some of the adhesive from said container and apply it to predetermined portions of the underside of the blanks.

6. In a box making machine, in combination, a horizontal guideway along which blanks are fed from one end of the machine to the other, said guideway comprising a series of laterally spaced strips upon which said blanks are supported and a pair of laterally adjustable side guides, a reciprocating member adapted to feed the blanks singly along said guideway by intermittent stages, pivoted dogs carried by and adjustable along said side guides and adapted to retain said blanks temporarily at spaced stations during return movements of said reciprocating member, a pair of laterally and vertically adjustable top guide members adapted to overhang said guideway above one of said stations, a pair of glue containers disposed beneath said guideway at said station, and a glue applying device comprising a pair of slides adapted to reciprocate in guides disposed upon each side of the machine and each having a longitudinally disposed arm secured to the upper end thereof, a pair of bars extending from side to side of the machine and adjustable longitudinally of said arms, a pair of downwardly extending brackets laterally adjustably secured to each of said bars, and a plurality of upwardly extending glue applying pins secured to the lower portions of each of said brackets and adapted to reciprocate between the strips comprising said guideway from said glue container to said blank, whereby the whole machine may be adapted to accommodate blanks of various lengths, breadths, and thicknesses.

7. In a machine of the kind described, a guideway through which box blanks are adapted to travel, a plurality of laterally and longitudinally separated reciprocating means for applying glue to a plurality of correspondingly separated areas of the under surface of each blank as it passes along said guideway, and rotary means for applying glue to a plurality of laterally separated areas of the upper surface of each blank as it passes along said guideway.

8. In a machine of the kind described, a guideway through which box blanks are adapted to travel, a glue receptacle arranged beneath said guideway, a plurality of glue-applying devices arranged in said receptacle, means to reciprocate said devices and move the same into contact with a blank on said guideway to thereby apply glue to a plurality of longitudinally separated areas of the under surface of the blank, and means to apply glue to separate areas on the upper surface of the blank as it passes along said guideway.

9. In a machine of the kind described, a guideway through which box blanks are adapted to travel, glue-receiving means arranged beneath said guideway, a plurality of glue-applying devices arranged in said glue-receiving means, vertically reciprocating means to which said glue-applying devices are secured, said devices being spaced apart and arranged to apply glue to a plurality of longitudinally separated areas of the under surface of a blank on said guideway, and rotary means for applying glue to a plurality of separated areas of the upper surface of the blank as it is moved along the guideway.

10. In a machine for applying glue to receptacle blanks or the like, in combination means for automatically advancing a receptacle blank through said machine by successive stages, a rotary member having a continuous circular glue applying surface and adapted to apply glue to a portion of said blank which extends entirely across the blank in the direction of its travel, and a vertically reciprocating member adapted to be automatically and intermittently actuated to apply glue to portions of said blank which are separated in the direction of travel by areas to which no glue is to be applied, and means for operating said reciprocating means and said blank advancing means in timed relation.

11. In a machine for applying glue to receptacle blanks or the like, in combination, means for advancing receptacle blanks through said machine by intermittent movements, a rotary member having a continuous peripheral glue applying surface and adapted to apply glue to portions of each of said blanks which extend entirely across each blank in the direction of its travel, another glue applying member, means for intermittently reciprocating said member in a direction perpendicular to the plane of said blanks to apply glue to portions of each of said blanks which are separated in the direction of travel from the corresponding portions of succeeding blanks by areas to which no glue is to be applied, and means for operating said reciprocating means and said blank advancing means in timed relation.

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