Dec. 1, 1925. 1,563,323

S. BERGSTEIN

PAPER BOX MAKING MACHINE AND THE LIKE

Filed Nov. 18, 1924 3 Sheets-Sheet 1

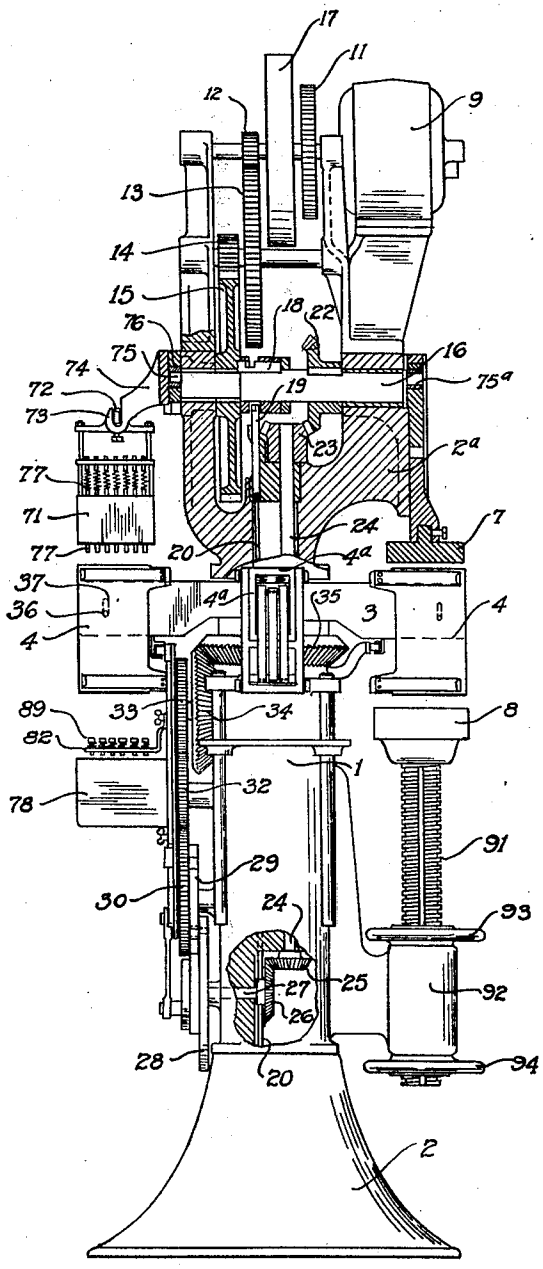


Fig. 1

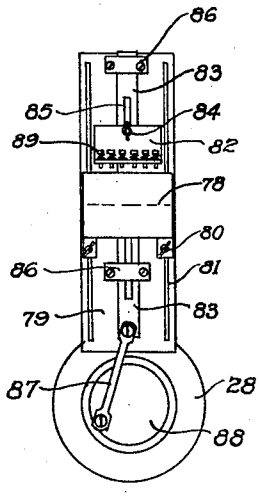


Fig. 2

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PAPER BOX MAKING MACHINE AND THE LIKE

Filed Nov. 18, 1924 3 Sheets-Sheet 2

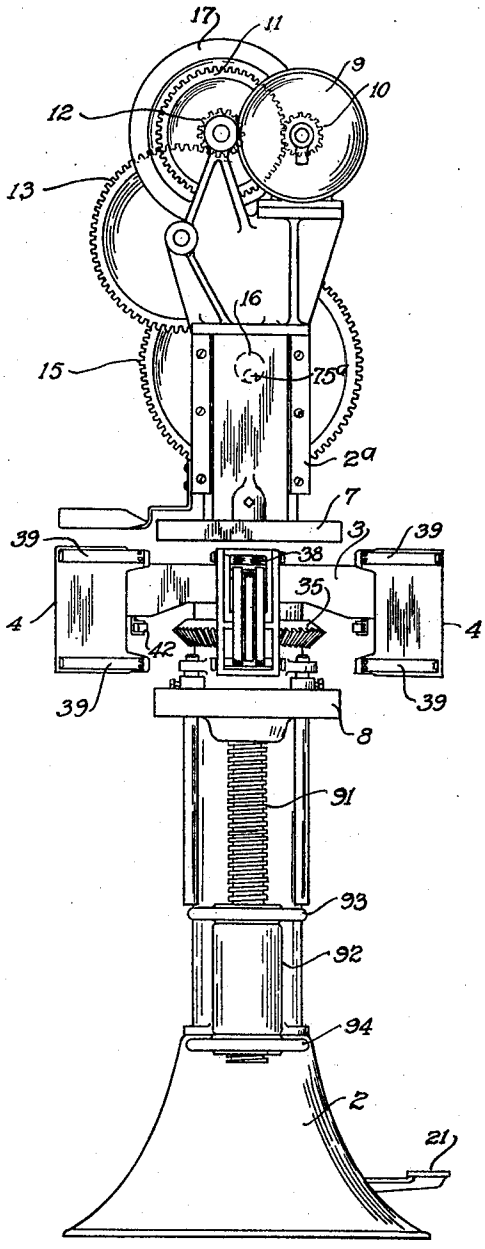


Fig. 3

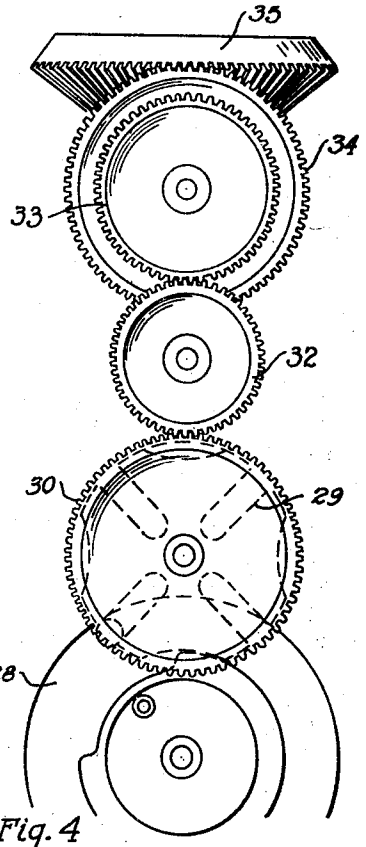


Fig. 4

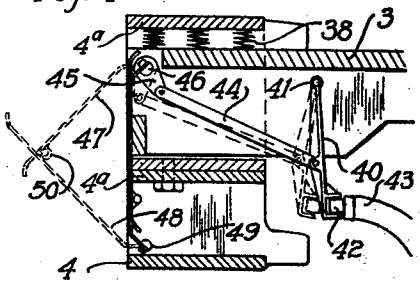


Fig. 5

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PAPER BOX MAKING MACHINE AND THE LIKE

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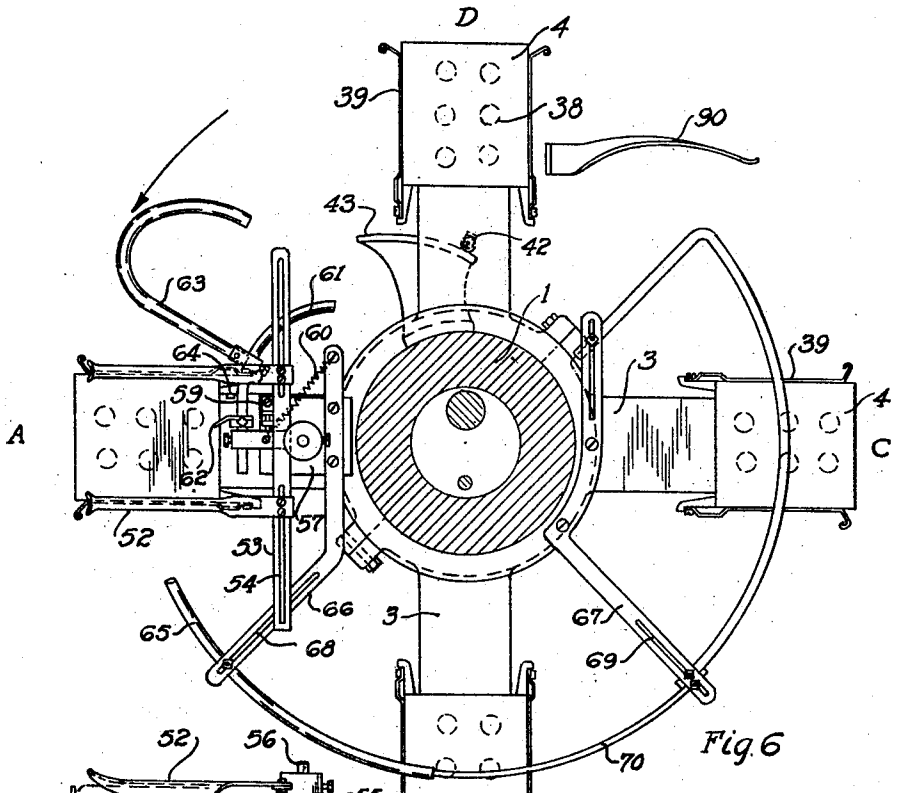


Fig. 6

Fig. 7

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Patented Dec. 1, 1925. 1,563,323

UNITED STATES PATENT OFFICE.

SAMUEL BERGSTEIN, OF MIDDLETOWN, OHIO, ASSIGNOR TO THE INTERSTATE FOLDING BOX COMPANY, OF MIDDLETOWN, OHIO.

PAPER-BOX-MAKING MACHINE AND THE LIKE.

Application filed November 18, 1924. Serial No. 750,646.

To all whom it may concern:

Be it known that I, SAMUEL BERGSTEIN, a citizen of the United States, residing in Middletown, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Paper-Box-Making Machines and the like, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in paper box making machines, having particular reference to the type of machine set forth in my copending application for patent, Serial No. 722,330, filed June 25, 1924.

The main object attained in the present invention consists in a machine adapted to produce a complete box in a single sequence of operations as distinguished from the earlier invention above referred to in which a double sequence of operations is required to complete a box.

The advantages of the improved machine consist in the saving of time, or greatly increased output of the machine, and the lower cost of production which is thus made possible.

The underlying purpose of the new type of machines, in the present and also in the preceding invention referred to, is to provide a box making machine which can be furnished at low cost to users of paper boxes in relatively small quantities, or in any quantities, which will enable them to make their own boxes as needed, thus making it unnecessary to carry a large stock of boxes in advance of their requirements as is the case under the present practice.

Under the new practice which my improved machine makes possible, the customer is furnished one or more of the box making machines, according to his requirements, and he carries a stock of boxblanks ready for forming on the machine. Thus the minimum of storage space for the stock is required, and the boxes can be made up as needed. The new practice also overcomes the tendency to delays under the old practice in filling orders by manufacturers, and enables substantial savings to be made in cost on small orders, the relatively higher cost of production by box manufacturers being due to overhead costs and setting-up time on small quantity orders.

The new type of machines marks a radical departure from the present practice of box making, the invention in a broad sense comprising both the apparatus and the process associated therewith for producing the boxes. To the end that the machines must be adaptable to be operated by such help as may be available to the user, the same are simply constructed and arranged for safe and convenient operation with relatively high output.

To meet the general requirements of the trade, the improved machines are also adaptable for making boxes of variable shapes and sizes, certain features of the mechanism being made interchangeable one unit with another to readily adapt the machines to all ordinary variations in size and style of the product.

An object attained in the series of inventions set forth in the several applications for patents herein referred to and including an application for patent on the new process of manufacturing involved in the practice of the invention, to be filed in a separate application, is a substantial improvement of the boxes produced thereon, the better quality of construction having reference more especially to the improved construction of the glued joints which is a determining condition of quality of paper box products.

The means and method of production comprised in the invention which result in the realization of these objectives are fully described in the following detailed specification and are defined in principle and by specific embodiment of coordinated elements in the appended claims; in the accompanying drawings, the invention is illustrated in an improved construction, it being understood that the drawings serve to illustrate the invention in one form only, and that it is contemplated in the commercial practice of the invention to make any suitable modifications of the various coordinated units of the mechanism and in the detail parts as may best serve the functions of the machines under the variable conditions of use.

As far as I am aware, my invention is broadly new in the art to which it pertains—the same, considered as a further development of the inventions subject matter comprised in the series of inventions herein referred to, being of basis character and therefore capable of broad comprehensive treatment in the definition and scope of the claims.

In the drawings:

Fig. 1 is a side elevation, partially in section, of the machine, showing the drive mechanism, adhesive depositing and joint forming mechanisms;

Fig. 2 is a side elevation of the lower unit of the adhesive depositing mechanism;

Fig. 3 is a side elevation of the transmission mechanism;

Fig. 4 is a side elevation of the work-table mechanism;

Fig. 5 is a sectional view of the forming blocks and ejector mechanism.

Fig. 6 is a plan view of the work table showing the folding mechanism.

Fig. 7 is a side elevation showing the forming blocks folded and ejection mechanism.

The improved machine as here shown comprises a vertical, hollow column 1, provided with a base 2, a work-head rotatable in a horizontal plane on column 1 and consisting of four radially extended arms 3 arranged at right angles one relative to another, each of the arms 3 being provided with a box forming block 4. Associated with the work-head and adapted to coact with the forming blocks 4 are a duplex gluing mechanism 5—6 and a duplex joint-forming mechanism 7—8 and coordinated mechanisms which will presently be described in the more detailed specification. Operation of the several units of the machine is effected by means of a power head comprising a motor 9, reduction and transmission gearing 10, 11, 12, 13, 14 and 15 constituting a geared transmission from the motor 9 to the main drive shaft 16, a belt and balance wheel 17 being interposed between gears 11 and 12, the same being adapted to have a power belt applied thereto for operating the machine independently of the motor 9. Gear 15 is mounted free on drive shaft 16, its operative relation therewith being controlled by means of a spring tensioned clutch mechanism 18 which in turn is controlled by a trip pin 19 connected by a rod 20 to a treddle 21 in base 2 of the machine, the clutch mechanism being of well known construction and commonly known as a tight-and-loose pulley connection.

Rotatable movement is transmitted from shaft 16 to the work table through bevel gears 22—23, shaft 24, bevel gears 25—26, shaft 27, pin gear 28, Geneva gear 29, spur gears 30, 32, 33 and bevel gears 34—35, gear 35 being secured to the work table. As here shown, the gearing is timed to cause a quarter-turn of the work table upon each full rotation of the pin gear 28 which advances the Geneva gear 29 a quarter-turn upon each driving engagement therewith, the entire gear train being retained at rest between operations of the Geneva gear by the interlocking relation between gears 28—29 in the manner well known in Geneva gears.

The box forming blocks 4 are mounted on the radial extensions 3, which may appropriately be termed the work-table anvils to have limited vertical movement relative thereto, each block being formed of two pieces, an inverted U-shaped inner member 4^a which is connected direct to the anvil by means of pins 36 set in the opposite sides of the anvil and extended outward into vertically extended slots 37 in the opposite side walls of part 4^a. The relation of the parts are such that member 4^a has limited vertical movement, compression springs 38 being interposed between the anvil and the intermediate wall of part 4^a, there being a spring inwardly adjacent each corner thereof, to support the forming block normally in raised position relative to the anvil. The other parts of the forming block consist of the integral part 4 which are secured to part 4^a in any suitable manner, as by screws. Parts 4 of variable sizes are adapted to be used interchangeably on parts 4^a thus to adapt the machine for making boxes of different sizes.

The forming blocks are further provided with retaining clips 39 arranged adjacent both ends of the block on opposite sides thereof, which serve to hold the box blanks E in position on the blocks during the gluing and joint forming operations. Each forming block is also provided with ejector, or kick-off mechanism for removing the finished box therefrom. This mechanism consists of a lever 40 pivoted as at 41 on each of parts 4^a and provided at its lower free end with a roller or cam follower 42 disposed in the horizontal plane of an outwardly extended cam 43 secured to column 1 of the machine, the coacting between the parts resulting in a reciprocal movement being imparted to lever 40 upon each full rotation of the work-table. A link 44 is connected to lever 40, intermediate roller 42 and its pivot center, and to a rocker arm 45 secured to a transversely extended shaft 46 supported on part 4^a. A downwardly extended kicker arm 47 is secured to shaft 46 and is thus adapted to be reciprocated outwardly upon each actuation of lever 40. An upwardly extended kicker arm 48 is secured to a rocker shaft 49 supported in the lower walls of part 4 and is operatively connected with arm 47 by means of a roller 50 provided on arm 47 intermediate its ends. It will be observed that there are two of the arms 48 for each ejector mechanism and that arm 47 is interposed therebetween, arms 47 and 48 being normally pressed inwardly and held in vertical relation relative to blocks 4 by a spring coiled on shaft 49 which acts also to return the arms to normal position after each actuation thereof, the outward movement of the arms being effective to remove a box from the forming block as will be more

fully explained in connection with the detailed operation of the machine.

As best shown in the plan view of the work-table in Fig. 6, the forming blocks are moved successively into positions A, B, C and D, the successive steps of forming a box beginning in position A where the attendant of the machine places the box blanks on the forming blocks.

As illustrated in Fig. 1, the work head has four work supporting units of identical construction which, when the machine is at rest, occupy positions A, B, C and D respectively, the direction of operation being counter-clockwise as indicated by the arrow. In this position opposite, outwardly extended guides 52 are provided to position the box for height on the box supporting block 4 so that the folds for forming the joints will be made uniform on all the boxes. To this end, arms 52 are formed concave, V-shaped as here shown, on their under side to receive the open, upward extended flaps *a* of the end of the box and to retain the same in vertical position until the first step of folding has been made. Arms 52 are supported on a bar 53 which is slotted as at 54 to permit of varying the spacing of the arms relative to each other to suit the width of the box for which the adjustment is made, bar 53 being in turn supported by a block 55 adjustable vertically on a rod 56 secured in a plate 57 fixed to the head support of the machine, whereby to set the arms 52 according to the height of the end flaps *a* of the box.

An arm 58 is pivoted on rod 56 at its base and in its idle position is drawn in clockwise direction against a stop 59 by a spring 60, the arm having secured therein a rearwardly extended, curved rod 61, which in turn has a finger 62 and curved rod 63 secured thereto, the rod 63 being adjustable on rod 61 longitudinally thereof. This mechanism serves to effect the first fold of the box, a lug 64 extended upwardly from each end of the anvils 3 acting upon rotation of the work head to engage the finger 62 and thus to rock arm 58 on its pivot center and to move arm 63 forward, in advance of the movement of the work head, into engagement with the adjacent end flap *a* of the box at right angles over the edge of the forming block 4, spring 60 acting to retract arm 58 as lugs 64 pass out of engagement with finger 62.

The opposite end flap *a*, upon rotation of the work head, is moved out of engagement with the other arm 52 and upon further advancement of the work head is brought into engagement with a circumferentially extended tubular rod 65 supported outwardly of the machine on brackets 66–67 in a plane and in a manner to effect a corresponding fold of the opposite flap *a*, both flaps *a* being then retained in folded relation as the unit supporting the box moves to position B. Brackets 66—67 are slotted as at 68—69 and tubular rod is arranged telescopically with a second rod 70 to permit of adjusting the rods radially relative to the work head to suit variations in the size of boxes.

The outstanding improvement in the machine of the present invention over the machine of the preceding application for patent herein referred to, consists in the duplex arrangement of the work head mechanisms which adapts the machine for forming both ends of the box simultaneously and thus to double the production capacity of the machine. To this end, duplicate mechanisms of parts 52 to 70 inclusive are arranged in a lower plane of the machine and act on the opposite end of the box to effect folds thereon substantially in the same manner as in the first instance described, the duplicate parts being numbered 52^a and 70^a inclusive. The action on the opposite ends of the box is simultaneous, the arrangement and operation of the folding mechanisms in the upper and lower planes of operation being substantially the same except that the operations are in inverse order, that is to say, the upper end of the box is folded downward and the lower end is folded upward.

The adhesive for the joints is applied to the folded ends of the box in position B, the adhesive mechanism comprising upper and lower units coacting one with the other to apply the adhesive to both sides of the box simultaneously. The upper unit of the mechanism consists of an adhesive container 71 suspended on a bar 72 which is supported in open bearing slots 73 of spaced arms 74 formed integrally one with the other and mounted on the head casting of the machine to have vertical reciprocal action thereon, operable movement being imparted thereto by means of a pin and groove connection 75—76 with the main drive shaft 16, the details of the arrangement being of well known construction. The container 71 is provided with a plurality of spring tensioned valve stops 77 coacting with ports in the bottom of the container, the ends of the valve stops extending through the ports and being adapted upon reciprocation of the container to be brought into contact with the folded upper ends of the box supported on the forming block. It will be understood that the valve stops act to close the ports when the container is in raised position, and on the down stroke of the mechanism, when their projecting ends come in contact with the end of the box on the forming block, and the same are pressed upward to open the ports and thus cause a regulated portion of adhesive to gravitate to the end of the stops, the same act to affect a deposit of adhesive

from each stop on the folded ends of the box blanks.

The lower unit of the adhesive applying mechanism consists of a container 78 supported on a plate 79, secured to column 1, by means of set screws 80 operable in slots 81 in plate 79, the arrangement providing for vertical adjustment of the container as required to suit the size of the boxes. Coacting with container 78 is an adhesive depositing mechanism comprising an angular-shaped member 82 secured to a vertically slidable member 83 by means of a set screw 84 operable in a slot 85 which adapts part 82 to be adjusted vertically on part 83 to retain in the same in normal relation with container 78. Part 83 is supported on part 79 by means of bearing blocks 86, and is adapted to be reciprocated vertically by a pitman 87 connected to a pitman wheel secured to pin gear 28. The lower portion of member 82 extends over the adhesive container, which is open at the top, and has arranged thereon a series of spring-tensioned pins 89 which are adapted to be submerged, upon the downward vertical reciprocation of part 82, in the liquid adhesive in container 78, and on the upward movement to be brought yieldingly in contact with the folded lower end of the box on the supporting block 4 and thus to effect a deposit of adhesive thereon from each of the pins 89, the movement being timed to be substantially simultaneous with the deposit of adhesive on the opposite end of the box from container 71.

Position C of the work table, as here shown, is an idle position which provides a short pause in the sequence of operations to permit the adhesive, applied to the parts of the box to be joined together, to cool and set to a desired extent before the joints are formed.

As the box supporting units move to position D, the coacting part *b* of the ends of the box are engaged by extended arms 90 and 90ª respectively of the mechanisms in the upper and lower planes of operation, and are folded over the previously folded parts *a* as the unit is moved to position D where the joints are formed under opposite pressure heads 7 and 8.

Pressure head 7 is reciprocally operable on the power head casting 2ª being connected to main drive shaft 16 as at 75ª in a manner similar to the connection 75 for actuating the adhesive container 71. The lower pressure head 8 is supported on a screw 91 adjustable vertically in a bearing extended outward from column 1. Coacting with screw 91 on opposite sides of bearing 92 are hand adjusting wheels 93 and 94 by means of which the screw and with it pressure head 8 can be raised and lowered and retained in adjusted position. By this arrangement the space between pressure heads 7 and 8 can be accurately regulated according to the height of the forming blocks 4, or the length of the boxes for which the machine is set up. It will be understood from the illustrations of the drawings that the upper end of the forming blocks is always in the same horizontal plane regardless of the height of the blocks, the variations of length being only in the lower plane of operation where provision is made for the same in the means for adjusting the lower adhesive and pressure mechanisms.

For any given length of box, the maximum distance between pressure heads 7 and 8 will be the length of the box, plus the extent of vertical movement of the forming block 4, the minimum distance being the length of the box with the ends compressed between heads 7 and 8 and the opposite ends of the forming block. Thus it will be seen that the first action of pressure head 7 on the forming block will be to force the block downward against the resistance of spring 38 to the limit of the vertical movement of the blocks when the folded end portions of the box having the adhesive thereon will be firmly pressed together to form the joints, the amount of pressure applied in the operation being determined by the adjustment of screw 91.

As the forming block carrying the completed boxes thereon move from the D to the A position, the cam follower 42 is brought into engagement with cam 43 and the ejector arms 47—48 are actuated to kick the box off the forming block which will then be ready to receive another box blank as it comes to a stop in the A position.

It will be observed that the box supporting units 4 move in a plane and through a cycle of operation common to all the units, there being five successive steps of operation in the cycle, i. e., placing of the box blanks on the forming blocks, folding of the parts to be glued to form the joints, applying the adhesive to the folded parts, forming the joints under pressure and removing the finished product from the forming blocks upon completion of the cycle.

From the foregoing detailed description and the illustrations of the drawings, the construction and operation of the improved box making machine will be readily understood, and its outstanding advantages appreciated by those experienced in the paper box industry. It will be seen that the machine is of simple, substantial construction that it can be produced and furnished to the trade at relatively low cost, that it is adapted for operation by ordinary, or unskilled help, that it is adapted for relatively large output, that the product may be varied in size and shape as required, that the machine, as here shown, is adapted in large part, and can readily be adapted for

automatic operation, that the successive steps of folding, applying the adhesive, and forming the joints are performed simultaneously on the opposite ends of the box, that the machine in all its functions of operation is adapted to produce a high quality product at relatively low cost, and that the machine is well suited to the requirements of users whose requirements or trade policies make it undesirable to carry a large stock or ready made boxes, who thus are enabled by installing box making machines of this character in their own establishments to make their own boxes as needed at lower cost and with a much smaller stock of material.

Having described my invention, I claim:

1. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned thereon with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

2. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned thereon with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded and means acting upon said folded portions by compression to effect an adhesive joint.

3. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned and retained thereon yieldingly with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

4. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned thereon with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting simultaneously on said opposite end folded portions to effect a deposit of adhesive thereon, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

5. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned thereon with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions relative to the portions first folded and means acting simultaneously by compression on the opposite end folded portions to effect adhesive joints.

6. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a member disposed vertically relative to the work table and adapted to have a box blank positioned thereon with opposite ends of the blank extended vertically beyond said member, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

7. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged

on said table and operable in a plane and through a cycle of operations common to all of said units, each unit comprising a box supporting member disposed vertically relative to the work table and adapted to determine the shape and main dimensions of a box as positioned thereon, having opposite end portions of the box extended beyond the member, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

8. A box making machine including in combination, a rotatable work table, a plurality of work supporting units arranged on said table and operable step by step with operating pauses between steps in a plane and through a cycle of operations common to all of said units, each unit comprising a member adapted to have a box blank positioned thereon with portions of the blank extended from opposite ends thereof, instrumentalities arranged in different planes along the path of rotation of said units comprising means acting to fold certain of said opposite extended portions, means acting to deposit adhesive on said folded portions, and means acting to fold other of said opposite extended portions over the portions first folded to effect an adhesive joint.

9. A box making machine comprising a member supported yieldably and adapted to support a box with portions of the blank extended beyond said member, a plurality of means coordinated one with another to be brought successively into operative relation with said member and to act on said extended portions of the box blank respectively to fold said portions one upon another and to make a deposit of adhesive between folds, said means including pressure means adapted to actuate said member to the extent of its yieldable movement and thereby to act on said folded portions by compression to effect adhesive junctures therebetween.

10. A box making machine comprising a member adapted to support a box blank with portions thereof extended beyond said member, and a plurality of means adapted to be brought successively into operative relation with said member and to act on said extended portions of the box blank respectively to fold said portions one upon another, to make a deposit of adhesive between folds and to form adhesive junctures therebetween by compression, said adhesive applying mechanism consisting of devices supported oppositely one of the other to receive the box supporting member therebetween, and adapted to be moved one toward the other to effect deposit of the adhesive simultaneously on the opposite ends of the box.

11. A box making machine comprising a member adapted to support a box blank with portions thereof extended beyond said member, and a plurality of means adapted to be brought successively into operative relation with said member and to act on said extended portions of the box blank respectively to fold said portions one upon another, to make a deposit of adhesive between folds and to form adhesive junctures therebetween by compression, said adhesive applying mechanism consisting of devices supported one opposite the other to receive the box supporting member therebetween and adapted to be adjusted one relative to the other to compensate for variations in the size of the boxes supported on said member and to be actuated one toward the other to effect deposits of the adhesive on opposite ends of the box.

12. A box making machine comprising a member adapted to support a box blank with portions thereof extended beyond said member, and a plurality of means adapted to be brought successively into operative relation with said member and to act on said extended portions of the box blank respectively to fold said portions one upon another, to make a deposit of adhesive between folds and to form adhesive junctures therebetween by compression, said compression mechanism consisting of two pressure heads arranged oppositely one of the other to receive the box supporting member therebetween and adapted to be moved one toward the other to form said joints.

13. A box making machine comprising a member adapted to support a box blank with portions thereof extended beyond said member, and a plurality of means adapted to be brought successively into operative relation with said member and to act on said extended portions of the box blank respectively to fold said portions one upon another, to make a deposit of adhesive between folds, and to form adhesive junctures therebetween by compression, said compression mechanism consisting of two pressure heads spaced one from the other to receive the box supporting member therebetween and adapted to be adjusted one relative to the other to compensate for variations in the size of boxes supported on said member and to be actuated one toward the other to form said joints.

14. A box making machine comprising a member adapted to support a box blank with opposite foldable end portions thereof extended beyond said member, and to be moved step by step with operating pauses between steps into operative relation with a plurality of coacting adhesive applying and pressure mechanisms arranged in the opposite planes of said extended portions and adapted to be

adjusted relative to said planes according to the size of the boxes and to act on said foldable portions during said pauses to effect adhesive joints therebetween.

15. A box making machine comprising a member adapted to support a box blank yieldingly thereon to receive folding and joint forming operations, ejector mechanism on said member operable within the box so formed and adapted to be actuated upon completion of the box to remove the same from said member.

16. A box making machine comprising a member adapted to support a box blank yieldingly thereon to receive folding and joint forming operations, ejector mechanism comprising a plurality of pivoted arms and a cam follower operable on said member within the box so formed and adapted to be actuated upon completion of the box to remove the same from said member.

17. A box making machine comprising duplex mechanisms arranged in opposite planes and adapted to act simultaneously respectively to effect folding and gluing operations for forming a box, a box supporting member arranged to be moved between said mechanisms to bring a box into operative relation therewith, said member having means to effect compensating movement between the planes of the duplex mechanisms to adapt the same to variations of length of boxes supported thereon.

In testimony whereof, I affix my signature.

SAMUEL BERGSTEIN.