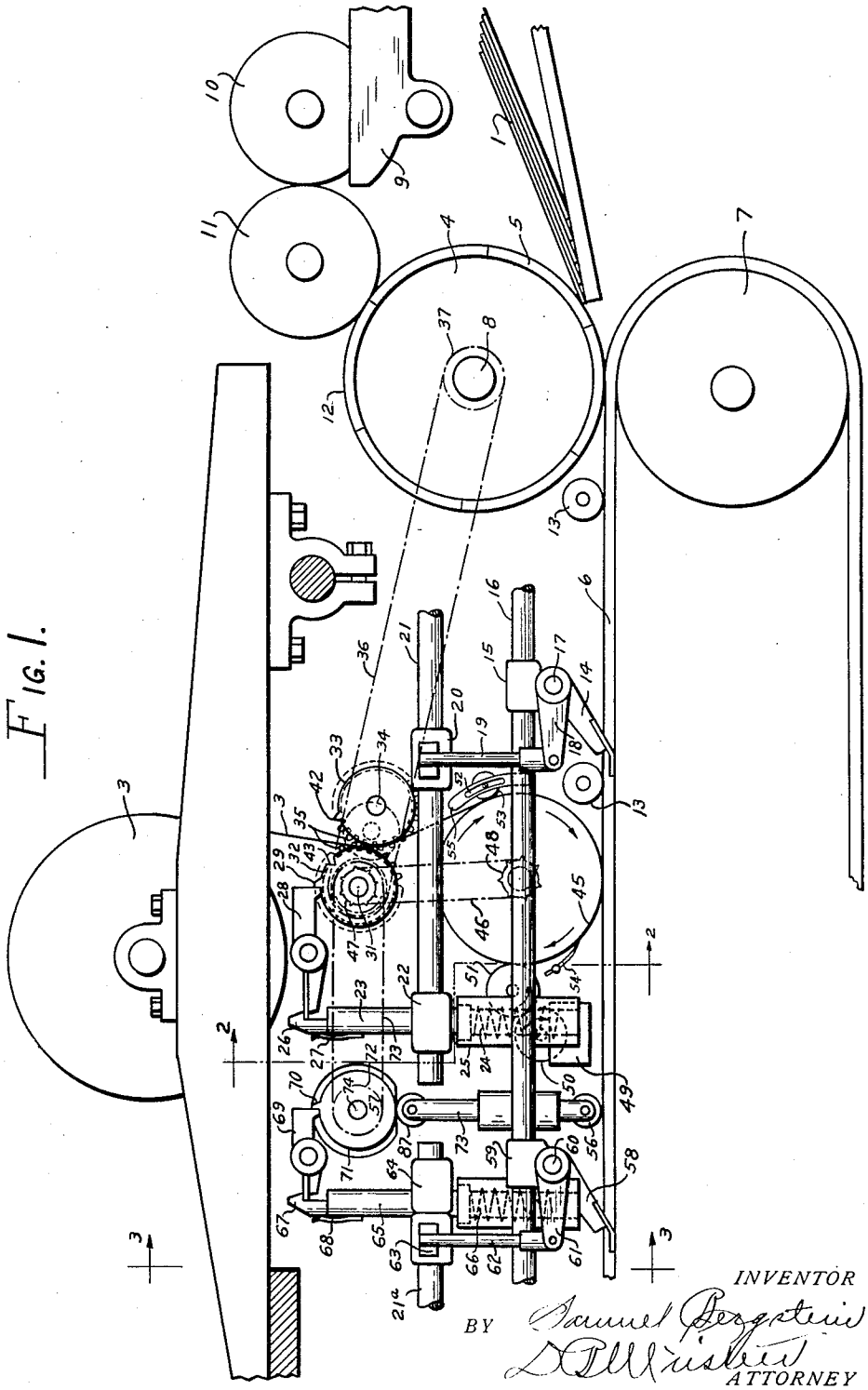
Nov. 24, 1931. S. BERGSTEIN 1,833,557

MEANS AND METHOD FOR MAKING PAPER CONTAINERS OR THE LIKE

Filed April 15, 1929 4 Sheets-Sheet 1

FIG. 1.



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FIG. 3.

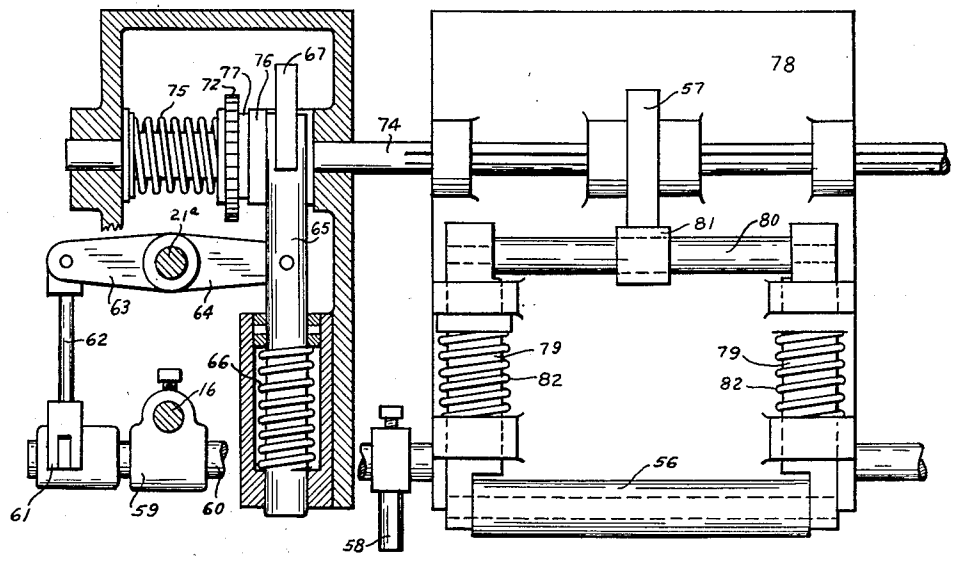
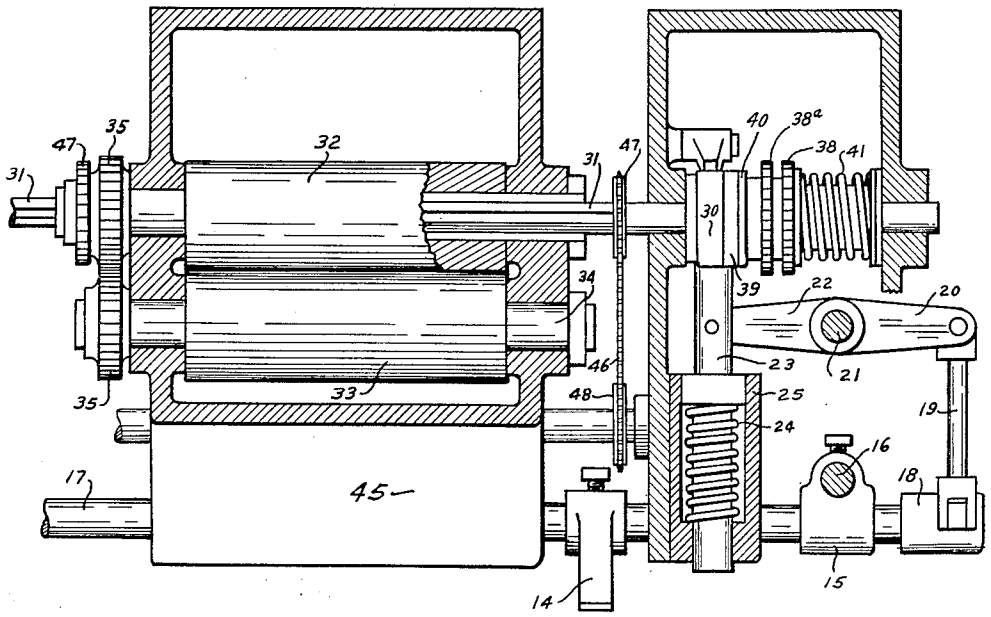


FIG. 2



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FIG. 4.

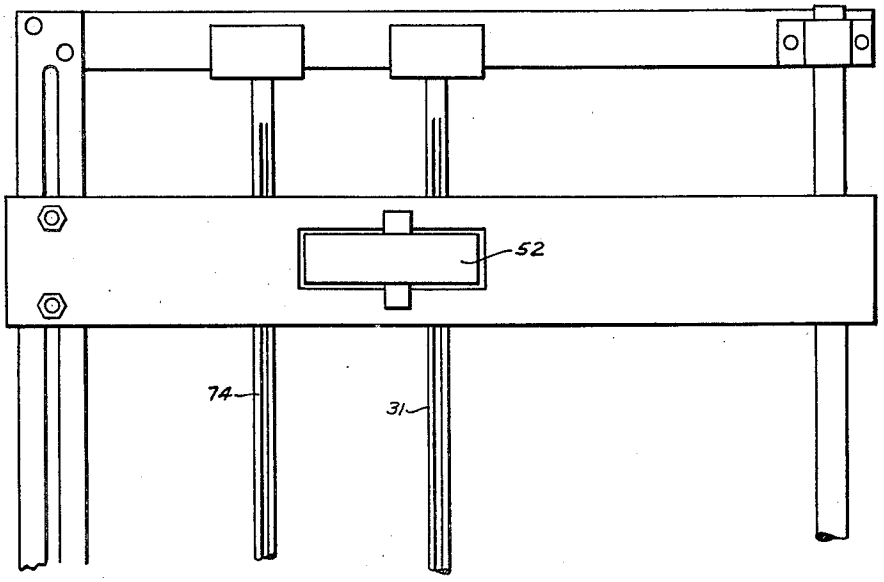
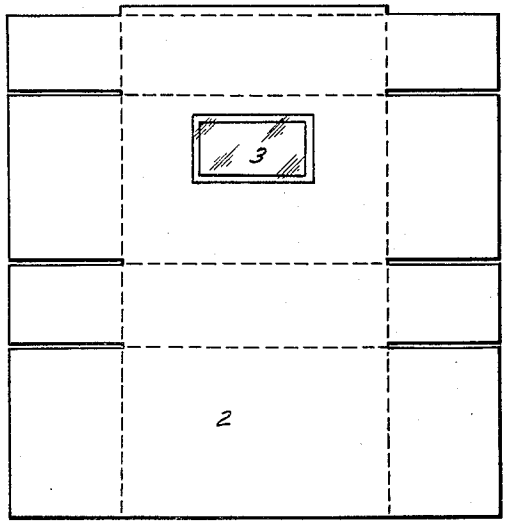


FIG. 5.



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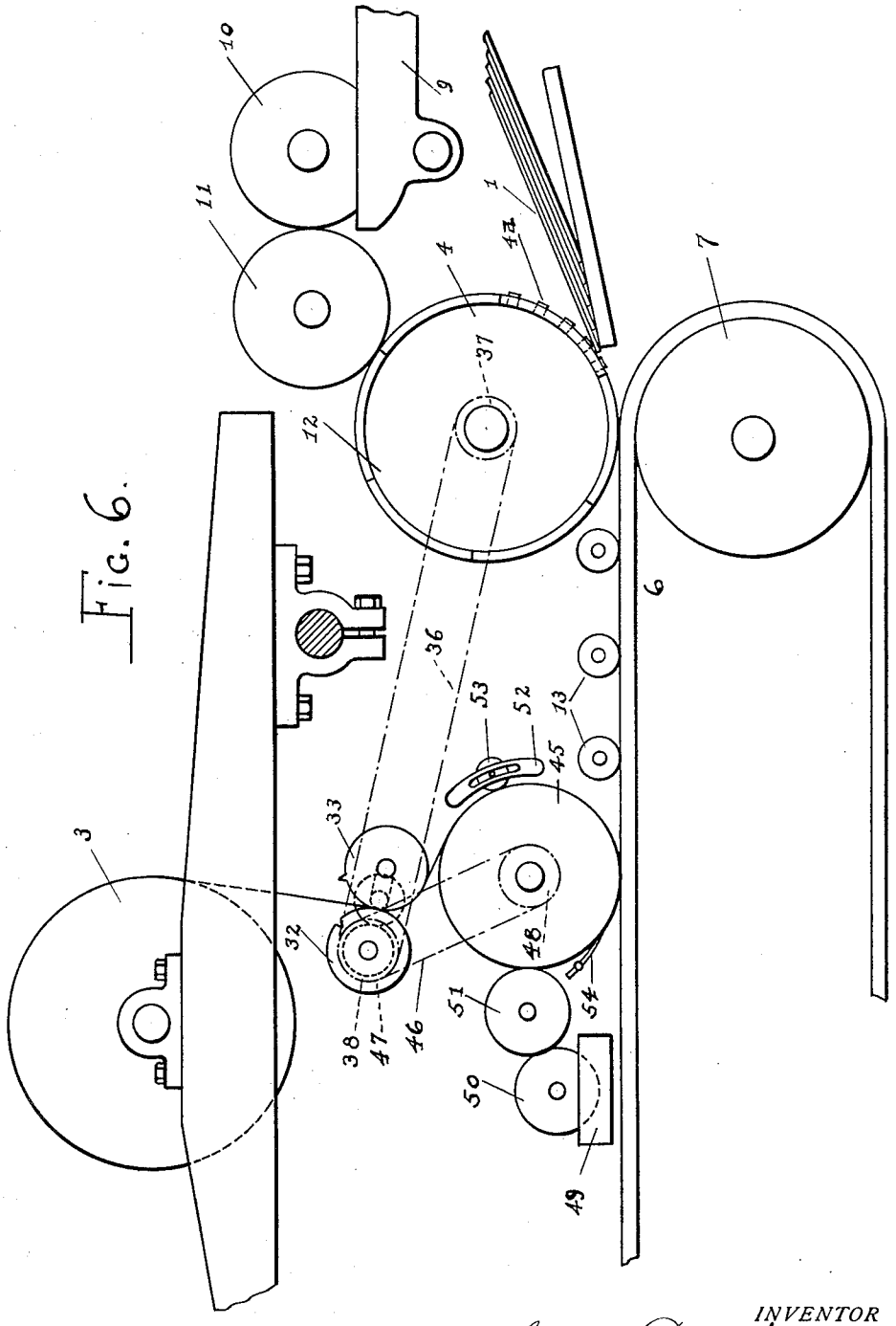


Fig. 6.

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UNITED STATES PATENT OFFICE

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MEANS AND METHOD FOR MAKING PAPER CONTAINERS OR THE LIKE

Application filed April 15, 1929. Serial No. 355,038.

This invention relates to improvements in means and method for making paper containers, such as boxes, bags, and similar articles, having particular reference to a machine for joining a transparent sheet material to the paper material before the containers are formed, the improvements being a modification and further development of the machine and process of manufacturing set forth in my copending application for Letters Patent of the United States, Serial No. 282,020, filed May 31, 1928.

The invention as herein set forth makes possible manufacturing of such paper products on a production basis at relatively low cost. The particular objects attained in the improvements consist in the provision of means for applying to the transparent material, incidental to joining the two materials together, an oleaginous substance which acts as a preservative of the material and affords certain operating advantages in making the product as herein described.

The practice heretofore in the manufacture of such articles, having particular reference to paper boxes, has been to apply the transparent material to the paper or box board by hand methods, involving hand gluing and hand assembling of the two materials at a time and labor cost too high to permit of using the boxes for many products for which they would otherwise be desirable.

It is contemplated in the practice of the invention as herein set forth to assemble the sheets or blanks of paper material and the sheets or covering portions of the transparent material by automatic machinery adapted for large output.

In the accompanying drawings, a machine embodying the invention in a preferred form and suitable modifications of the machine are shown for the purpose of illustration, the improved method or process of manufacturing applying generally to machines of the character here shown.

In the drawings:

Fig. 1 is a detail view in side elevation of the machine for assembling the two materials;

Figs. 2 and 3 are detail views of parts of the mechanism taken respectively on lines 2—2 and 3—3 of Fig. 1;

Fig. 4 is a detail plan view of part of the frame structure of the machine;

Fig. 5 is a view of a box blank in one form of the paper material;

Fig. 6 is a view in side elevation showing a modification.

The means employed for practicing the invention as herein shown and described consist in an attachment applied to a machine for gluing paper box blanks. The general construction and operation of such machines being well known in the art, only such parts of the mechanism as are directly associated with the improvements applied thereto are shown in the drawings and herein described.

The paper material, blanks cut and scored for forming, may be prepared in advance with adhesive for joining the paper and transparent materials together and for forming and sealing the containers, or the adhesive may be applied to the paper material on the machine. For stock blanks prepared in advance with adhesive, means are provided on the machine for moistening the adhesive, and for blanks not prepared with adhesive in advance, means are provided for applying adhesive to the paper material before the two materials are brought together for joining.

In Fig. 1 the box blanks 1 are shown as arranged in a stack for moving the blanks singly on the machine, a common form of box blanks being illustrated in Fig. 5. The transparent material 3, as here shown, is wound on a roll in a continuous sheet or strip, the portions required for each box blank being severed from the sheet incidental to the operation of joining one material to the other.

The feeding mechanism for the paper blanks illustrated in Fig. 1 is of well known construction and is illustrated more or less conventionally. The parts shown consist of a feed roller 4 mounted on a shaft 8 and provided with a friction pad 5 for engaging the outer sheet of paper material and moving the same between the roller and a belt 6 traversing a pulley 7 opposite roller 4.

Any suitable gluing or moistening device

may be arranged for rendering the box material adhesive, accordingly as the paper stock is or is not prepared with glue. Such devices are well known in the art and do not require a detail showing in their relations to the improvements herein set forth. A glue moistener is shown conventionally in Fig. 1 in its relation to feed roller 4. The essential parts of the moistener consist in a container 9 for water and rollers 10—11 for conveying moisture from the container to a roller 12 on shaft 8 which acts to transfer the moisture to the paper blanks which are prepared with adhesive for assembling the two materials, thus acting to render the blanks adhesive.

As the paper blanks pass the feed roller 4, they are held frictionally in engagement with belt 6 by a series of pressure rollers 13, the forward edge of each blank being moved into engagement with the lower end of a depending arm 14 pivoted on a bracket 15 on rod 16 extended longitudinally of the machine. As the arm 14 is actuated successively by the blanks the movement is transmitted through the pivot shaft 17, arm 18, link 19, and arm 20 to a shaft 21 which extends parallel with rod 16 and has limited rotatable movement. From shaft 21 the movement is further transmitted through arm 22 to a vertically extended, spring-tensioned bolt 23, the lower end of the bolt and a spring 24 for normally holding the bolt in raised position being supported in a housing 25. The upper end of the bolt is provided with a pivoted latch or finger 26 tensioned by a spring 27 for engaging the adjacent end of a pivoted pawl 28 which coacts at its opposite end with a shoulder 29 on a disc 30 secured to a shaft 31 upon which a roller 32 is supported, the roller being operably associated with a second roller 33 on shaft 34 by gears 35, as best shown in Fig. 2. The roller shaft 31 is connected to feed roller shaft 8 by a chain and sprocket connection 36—37—38, sprocket 38 being free rotatably and slidably on shaft 31. The driving connection between the sprocket and the shaft consists in a friction clutch of well known construction, comprising as here shown the disc 30 which is secured to the shaft, a fiber disc 39, interposed between a disc 40 which is formed integrally with sprockets 38—38—*a*, and disc 30, and a spring 41 arranged telescopically of the shaft and acting to exert pressure on the sprockets for effecting the friction drive between the sprockets and the shaft.

When lever 14 is moved by the forward edge of a paper blank, bolt 23 is forced downward against the resistance of spring 24, and pawl 28 is moved out of engagement with disc 30; rollers 32—33 being rotated through the chain and sprocket connection 36—37—38 and the friction clutch on shaft 31, pawl 28 being in position under the action of spring 24 to stop the rollers upon completion of one revolution.

The function of rollers 32—33 is to feed the strip of transparent material forward and to perforate the strip at measured intervals as the material is drawn off the supply roll. To this end the rolls are provided with coacting male and female line perforators 42—43 extended axially of the rolls for perforating the strip transversely upon each rotation of the rolls, which are operably timed through the connection 36—37—38 with feed roller 4, the spacing of the line perforations longitudinally of the strip being regulated to the length of transparent material required for each paper blank. The length of transparent material required for each paper blank is drawn off the supply roll by the feeding action of rolls 32—33 and is moved into engagement with the adhesive portion of a paper blank in position to receive it by a roller 45 which is driven from shaft 31 by a chain and sprocket connection 46—47—48.

Operably associated with roller 45 are means for moistening the roller consisting as here shown, of a container 49 for a suitable oleaginous liquid, such as paraffin oil, which serves the double purpose of moistening the feed roller for causing the transparent material to adhere lightly to the roll as it is moved by the roll into engagement with the box blank, and for effecting a light coating or film covering of the liquid on the face of the transparent material with which the roll contacts, which tends to preserve the material in its normal pliable state. The oily substance also acts to prevent the wet glue on the paper blanks, with which roller 45 may come in contact, adhering to the roller, which might otherwise result in abnormal operation of the machine, such as irregular feeding of the transparent material, which would cause roller 45 to contact with the adhesive on the paper blanks.

The liquid is conducted from container 49 by a roller 50 which is partially immersed in the liquid, and an intermediate roller 51. A scraper 54 acts to prevent the formation of foreign substances on roller 45 which would tend to interfere with normal operation of the roller.

The feed and perforating rollers 32—33 are of the required diameter for feeding the strip of transparent material forward to the required extent for presenting a portion of the material, sufficient to cover the adhesive portion of the paper blank upon each feeding action. Partial severing of the transparent material is made by the line perforators 42—43, complete severing being effected by coaction between roller 45 and a contact roller 53 supported on a slotted bracket 52 for changing the position of the roller according to the distance between the per-

foration lines of the transparent strip. The end portion of the material fed forward by rollers 32—33 adheres to the moist and more or less tacky surface of roller 45 and is drawn between rollers 45—53, the relatively higher speed of roller 45 than the movment of the material acting to exert sufficient tension on the material for tearing the strip on the perforated line between roller 52 and feed rollers 32—33. The severed portion of the material adheres slightly to the periphery of roller 45 and is moved into contact and into register with the glued portion of a box blank in position under the roller to receive it.

As the length of the strip of transparent material applied to each blank is determined by the diameter of the feed rollers 32—33, it will be seen that the portion so applied can be made to approximate the size and outline of the portion of the paper blank it is to cover by varying the diameters of the feed rollers as indicated in dotted outlines in the assembly of the rollers. To this end also roller 53 is adjustable on bracket 52 for varying the distance between the roller and the perforating line of the feed rollers according to the length of material fed forward on each operation of the feed rollers.

As the forward edge of the paper blank advances beyond roller 45 it moves under a pressure roller 56 which during the movement of the forward edge of the blank thereunder is in raised position above the plane of movement of the blank. As the blank is further advanced the forward edge of the blank engages a depending arm 58 and moves the arm upward in the same manner as the upward movement of arm 14. Lever 58 serves for controlling the operation of a cam 57 through mechanism consisting of a bracket 59 on rod 16, a shaft 60 supported in the bracket to which the lever is pivotally connected, an arm 61, link 62 and arm 63 connecting shaft 60 with shaft 21—*a* which is axially aligned with shaft 21. From shaft 21—*a* the movement is transmitted through an arm 64 to a spring-tensioned bolt 65, comprising a spring 66, latch finger 67 with a shoulder 70 of a disc 71 mounted on the same shaft with cam 57. The cam shaft is driven with a chain and sprocket connection 38*a*—72—73, sprocket 38—*a* being formed integrally with sprocket 38. The driving connection between sprocket 72 and the cam shaft 74, as best shown in Fig. 3, consists of a friction clutch comprising a spring 75 for moving the sprocket axially on the shaft, a disc 76 secured to the shaft and a friction disc 77 interposed between the sprocket and disc 76. Parts 58 to 77 inclusive are substantially the same in construction and operation as parts 14 to 39 inclusive.

When cam shaft 74 is released upon actuation of lever 58, cam 57 will be actuated one turn through the connection 38*a*—72—73, operation of the cam acting to force roller 56 against the superposed sheets of material, as the same are moved by the blank carrier belt 6 thereunder, with the required pressure for effecting firm adhesion between the sheets. The connection between the cam and the pressure roller, as best shown in Fig. 3, consists of a depending frame structure 78 in which a spring-tensioned frame 79—80 is slidably supported. The upper frame member 80 is provided with a roller 81, which is in operable relation with cam 57, the frame 79—80 together with the pressure roller 56 being held in raised position, when the cam is in neutral relation as indicated in Fig. 1, by opposite springs 82 arranged telescopically of the vertical frame members 79.

The mechanism for moving the paper blanks, for feeding the transparent material to the blanks and the pressure mechanism including the cam releasing arm 58 and the cam 57 are supported for lateral adjustment transversely of the machine, the cam shaft 74 being splined for the purpose and the arm 58 provided with any suitable means as a set screw for securing the same on rod 60. Thus the machine as a whole is readily adaptable, by adjusting the mechanism and by interchanging feed rollers 32—33 of different diameters for advancing the transparent material and regulating the position of roller 52, for applying the material in any predetermined size over a corresponding glued portion of the paper blank. It is apparent that the transparent material may also be cut in advance to the required size of the sheets and applied to the paper blanks or sheets by making suitable modification of the mechanism for feeding sheets or blanks instead of a continuous strip of material, without departure from the principle of the invention.

The modified construction illustrated in Fig. 6 is a preferred form of the machine for common types of paper containers, such as boxes, bags, etc., made up from blanks; the organized unit of the machine comprising, as here shown, the feed rollers 4—7 and belt 6, adhesive applying mechanism 9—10—11—12, the feeding and perforating rollers 32—33 for the transparent material 3, the moistening devices 49—50—51, the moistened feed and pressure roller 45, contact roller 53 and the driving connections 36—37—38 and 46—47—48.

The coordinated feeding of the paper blanks 1 and of the transparent material 3 is accomplished by the timed relation between rollers 4, 32—33, and 45, the feeding action on the blanks by roller 4 being rendered positive by the friction devices 4—*a*.

Variation in feed and perforating rollers 32—33 for determining the lengths of the transparent sheets is effected, as indicated in dotted outlines, by substituting larger or

smaller rollers, as the case may be according to the required lengths of the sheets. For delivering the transparent sheets to the paper blanks in the required time for presenting the transparent sheets in register with the adhesive-treated portions of the blanks, as the two materials are moved into assembling relation with roller 45, the driving connection between rollers 4 and 32—33 is timed accordingly for presenting the transparent sheets sooner or later, as the case may be, according to the position of the portion of the blanks prepared with adhesive for receiving the transparent sheets.

As far as I am aware the inventions set forth herein and in the aforesaid application for patent are the first of their kind for assembling sheet and blank materials in the manner set forth. The improvements of this later invention are accordingly defined broadly in the appended claims both as to the means and method employed for practicing the invention.

I claim as my invention:

1. A process for applying a transparent window to a box blank having a window opening consisting in applying adhesive to the borders of the window opening in the blank and moving the blank and a sheet of transparent material into superposed relation one with the other, said sheet being advanced into said relation by a roll, in applying a substance to said roll to cause the sheet moved thereby to adhere thereto for advancing said sheet into said relation with said blank and to prevent adhesive applied to said blank from adhering to said roll.

2. A machine for assembling sheet materials including a friction roller for advancing one material on said machine, means operably coordinated with the friction roller for rendering each portion of material so advanced adhesive, feed rollers for advancing a sheet of another material and perforators operably associated with said feed rollers for effecting perforating of the last named material at measured intervals on lines extended transversely of said sheet, a moistened roller to which material advanced by said feed rollers adheres and means which acts to tear the measured portions thereof on said perforated lines and to apply the severed portions to the portions of the first named material rendered adhesive for effecting assembling of said materials.

3. A machine for assembling sheet materials including a friction roller for advancing one material on said machine, means operably coordinated with the friction roller for rendering each portion of material so advanced adhesive, feed rollers for advancing a sheet of another material and perforators operably associated with said feed rollers for effecting perforating of the last named material at measured intervals on lines extended transversely of said sheet, a moistened roller to which material advanced by said feed rollers adheres and which acts to tear the measured portions thereof on said perforated lines and to apply the severed portions to the portions of the first named material rendered adhesive, said friction roller, feed rollers and perforators, and said moistened roller being operably timed one with another for effecting assembling of said materials in prescribed areas one material relative to the other.

4. A machine for assembling sheet materials including a friction roller for advancing one material on said machine, means operably coordinated with the friction roller for rendering portions of said material so advanced adhesive, feed rollers for advancing a sheet of transparent flexible material and means for partially severing said material into measured lengths, a roller to which said flexible material advanced by said feed rollers adheres, and means coacting with said roller for completing the severing of said material into its measured lengths and for applying said severed lengths to the adhesive coated portions of said first noted material.

In testimony whereof, I affix my signature.

SAMUEL BERGSTEIN.