

No. 715,620.

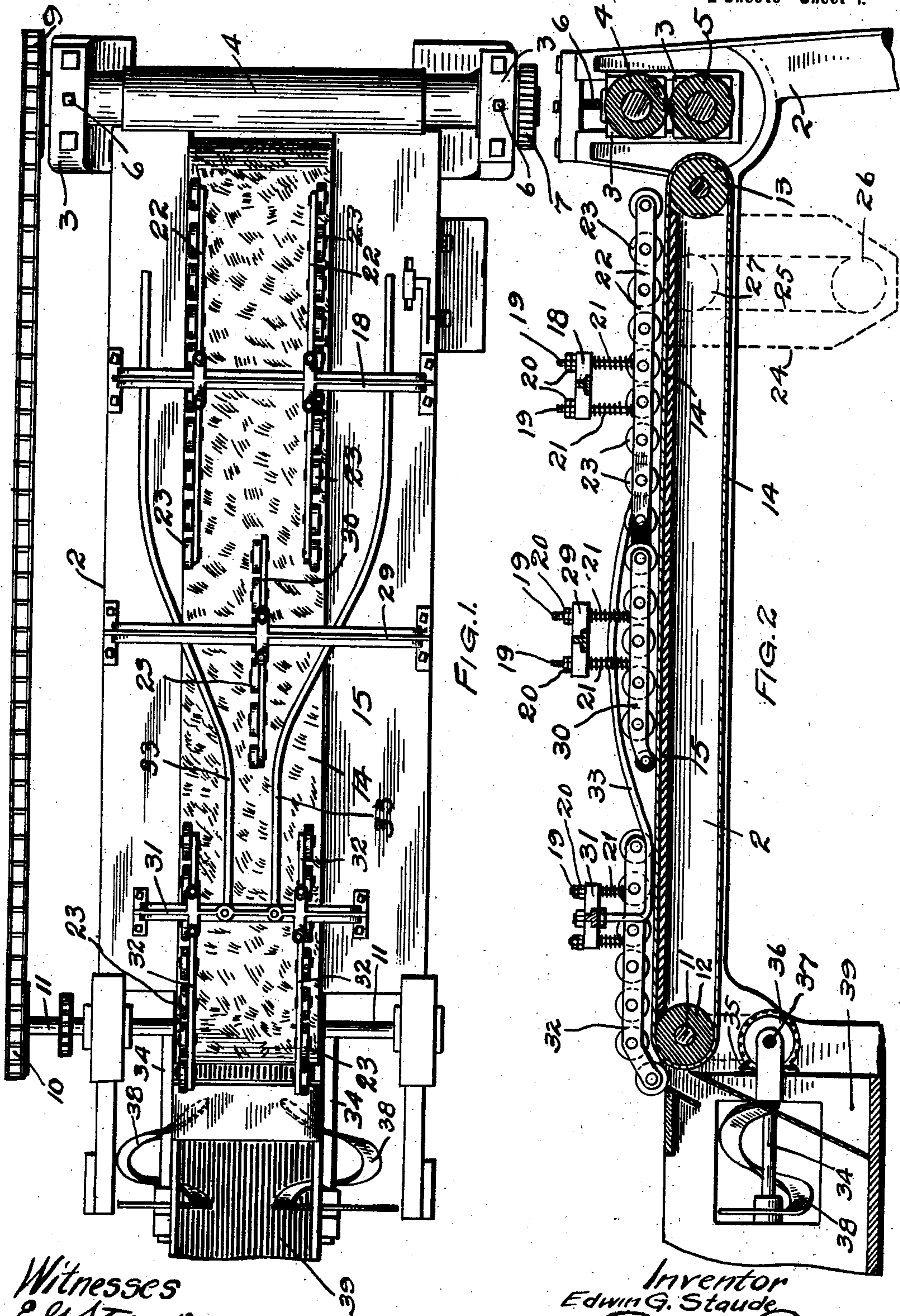
Patented Dec. 9, 1902.

E. G. STAUDE.
PASTING AND FOLDING MACHINE FOR BOX BLANKS.

(Application filed Mar. 25, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
E. G. Staude
McPherson

Inventor
Edwin G. Staude
By Paul Paul
his attorneys

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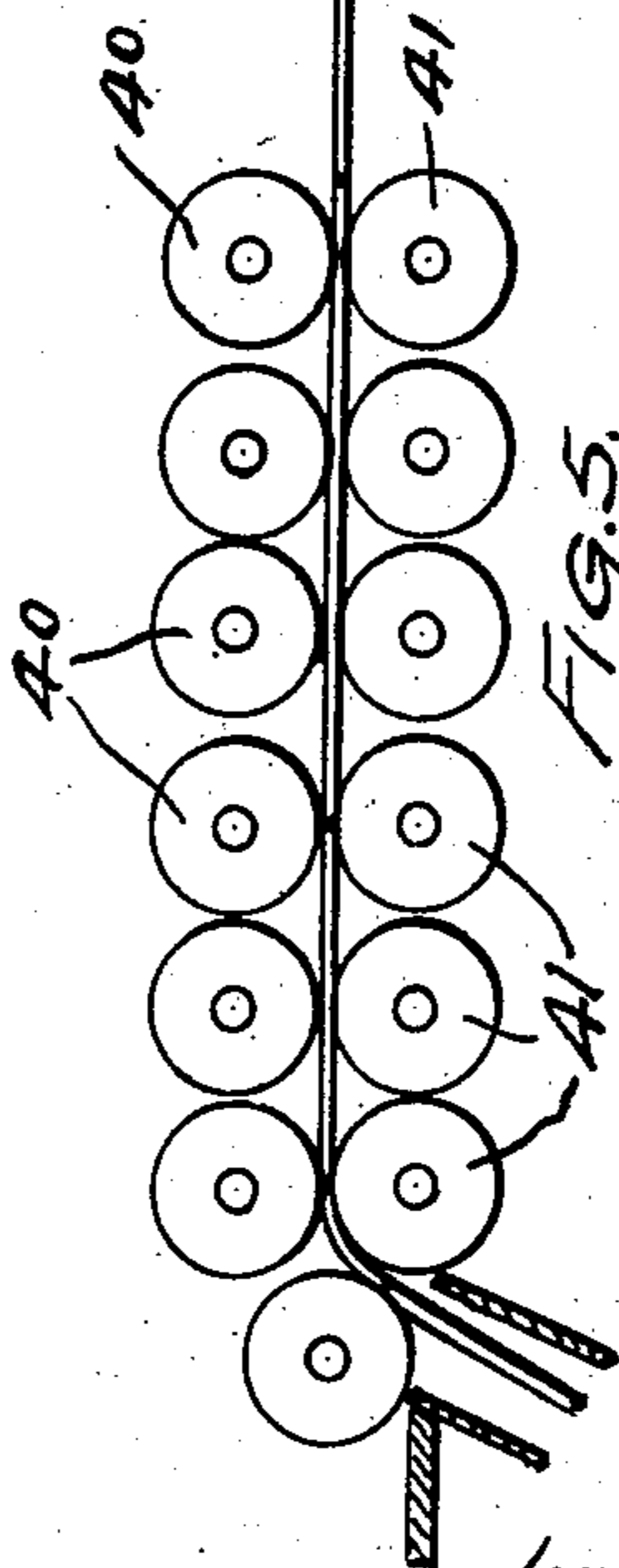
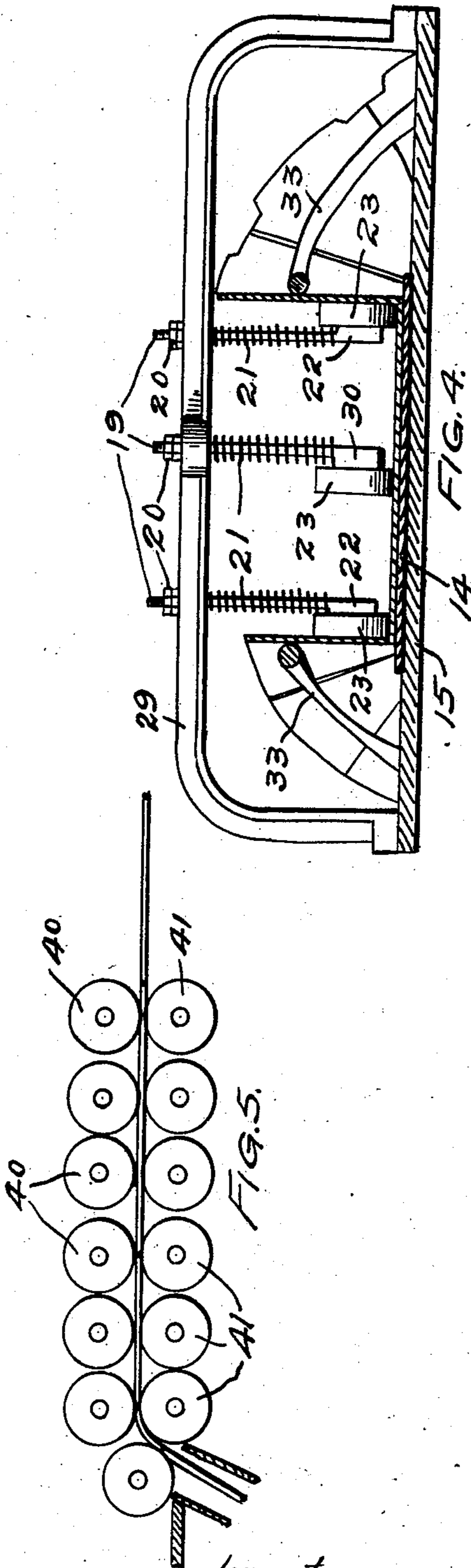
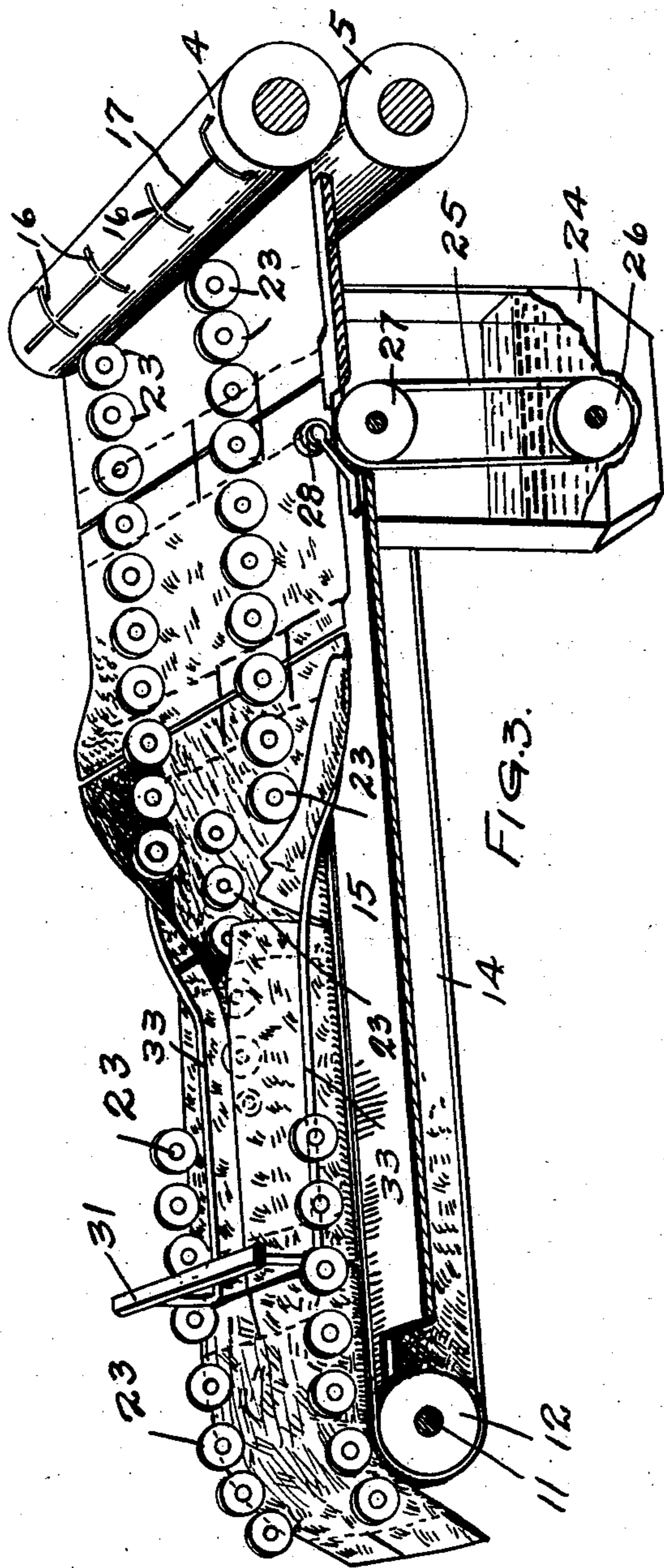
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McGowan

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UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

PASTING AND FOLDING MACHINE FOR BOX-BLANKS.

SPECIFICATION forming part of Letters Patent No. 715,620, dated December 9, 1902.

Application filed March 25, 1902. Serial No. 99,846. (No model.)

To all whom it may concern:

Be it known that I, EDWIN G. STAUDE, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Pasting and Folding Machines for Box-Blanks, of which the following is a specification.

The invention relates to machines for making paper or pasteboard boxes adapted particularly for containing cereal foods.

The object of the invention is to provide a machine wherein very thin and cheap brittle paper can be cut, pasted, and folded with neatness and despatch, which cannot ordinarily be done in pasting-machines as now constructed, owing to the fact that the paper is too thin to be pushed along by the traveling belts and their lugs or is not sufficiently tenacious to permit the partially-severed blanks to be dragged through the several steps of pasting and folding.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in providing traveling members between which the box-blanks are fed and by which they are carried along through the successive steps of pasting and folding.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a box-making machine embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a perspective view of the cutting, pasting, and folding devices removed from the supporting-frame and in section. Fig. 4 is a transverse section showing the position of the folding devices with respect to the rotating guides or the presser-rolls; and Fig. 5 is a detail view of a modification, showing two sets or series of rolls between which the blanks are fed.

In the drawings, 2 represents a suitable frame having bearing-blocks 3 at one end for the upper and lower cutting-rolls 4 and 5, the former being adjustable toward or from the latter by means of the set-screws 6. The shafts for said rolls project beyond their bearings on each side of the machine, and the up-

per roll is provided with a gear 7, meshing with a similar gear on the shaft of the lower roll, and on the opposite end of the lower roll I provide a sprocket 9, connected with a smaller sprocket 10 on a shaft 11 near the opposite end of the machine. The shaft 11 carries a roll 12, and a similar roll 13 is provided near the cutting-rolls, and upon said rolls 12 and 13 I arrange an endless conveyer-belt 14, that is adapted to travel over a flat table or bed 15, provided on said frame and extending lengthwise thereof. The cutting-rolls are provided in their peripheries with the usual scoring means (not shown) and transverse knives 16, which score and cut the blanks where they are to be folded, and longitudinal knives 17 to sever the blanks one from another as the sheet passes between the rolls.

Upon the table 15 near the cutting-rolls I provide an arched frame or bracket 18, provided near its ends with vertically-slidable rods 19, that are adjusted by means of nuts 20, and are provided beneath said bracket with springs 21, which engage the under side of the bracket and horizontal bars 22, carried by said rods, and normally hold said bars and rods in their depressed position. The bars 22 run parallel with the conveyer-belt and table and are provided with a series of idle wheels 23, between which and the conveyer-belt the box-blanks are fed from the cutting-rolls and by which said blanks are held in a flatwise carrying position upon said belt. A paste-reservoir 24 is provided on one side of said table, and a chain 25, operating over wheels 26 and 27, lifts the paste to the surface of the table, and as the edges of the blanks pass between the wheel 27 and the paster wheel or device 28 a sufficient quantity of paste is smeared along the edge of the blank to secure the overlapping edges together when the blanks are folded. This paste-reservoir device has been described in detail in my previous pending application, and hence needs no further illustration or description herein. Near the middle of the table I provide a second bracket 29, corresponding to the one described, except that it is provided with a single wheel-supporting bar 30, arranged, preferably, along the central line of the table and carrying a series of wheels corresponding to those heretofore de-

scribed and adapted to engage the blanks near the middle line thereof. These wheels serve to hold down the middle of the blank while the sides are being raised by the action of the folders, the first set of wheels, heretofore described, being designed to hold both sides of the blanks on the belt while the edges are being smeared with paste and when the sides of the blanks are first engaged by the folder-arms.

Near the discharge end of the machine I provide a third bracket 31, carrying two parallel bars 32 near its ends and the edges of the belt, said bars being supported in a manner corresponding to those heretofore described and carrying a series of idle wheels which serve to engage the sides of the blank after they have been folded and turned in over the middle portion and press them down to bring the edge that is smeared with paste into contact with the one that it overlaps. During the passage of the blanks over the table they are held between the idle wheels and the belt and carried rapidly along through the steps of pasting and folding. The blanks will be entirely severed one from the other, and being held down upon the belt and table by the yieldingly-carried wheels above will be prevented from twisting or curling or becoming bent or broken through their extremely flexible or brittle character.

The folding means which I prefer to employ in connection with this machine consists of arms 33, that are secured to the bracket 31 and extend back beneath the other brackets in position to engage the blanks as they leave the cutting-rolls. The receiving ends of the folders lie close to the table to pass beneath the approaching ends of the blanks, and the folders are then gradually curved upward and inward to a point above the middle portion of the carrier-belt. Until reaching a point near the discharge end of the bar 30 the folders run substantially parallel with each other to their points of connection on the bracket 31. The various curves and bends in these folder-arms serve to make the necessary folds in the blanks to produce the complete box.

In Fig. 3 the sides of the box are represented as being turned up to a vertical position by the folder-arms, while in Fig. 4 the sides are shown vertical and about to be turned over one upon the other. Near the discharge side of the machine I provide shafts 34, provided with gears 35, driven from similar gears 36 on a shaft 37, and said shafts 34 are provided with spiral conveyers 38, that engage the edges of the blanks as they are discharged from between the conveyer-belt and wheels and advance them on edge within a conveyer box or casing 39, where they are packed ready for use.

In Fig. 5 I have shown a construction wherein the conveyer-belt is dispensed with, and I have provided two sets or series of wheels or rolls 40 and 41, between which the blanks are fed and advanced. Either one or both sets of

these wheels are driven by suitable means. These wheels will serve to advance the blanks quite as rapidly as the mechanism heretofore described and in some cases may be preferable to the conveyer-belt. I do not wish to confine myself, however, to the particular adaptation shown of the wheel or roll feeding means, as the same is capable of various modifications, the essential feature of the invention being the means for advancing the blanks that is adapted to receive either those of very thin and flexible or cheap brittle material or that which is comparatively stiff in character and advancing the same through the successive steps of forming the box with equal facility.

I claim as my invention—

1. The combination, with the cutting and scoring rolls, of an endless carrier-belt whereon the cut and scored blanks are delivered, curved folder-arms provided above said belt, the intermediate or middle portions of said arms being inwardly curved toward the middle of said belt and adapted to fold the raised sides of the blanks in over the middle portions thereof, means near the receiving ends of said folders for holding the blanks upon said belt during the operation of raising and turning in their edges, a pasting device, and idle wheels provided above the middle of said belt between the inwardly-curved sections of said folders to press the blanks down upon said belt, and said wheels extending to a point opposite the termination of said inwardly-curved sections to insure the rapid continuous feed of the blanks while their sides are being folded.

2. In a pasting and folding machine for box-blanks, the combination with an endless carrier-belt whereon the cut and scored blanks are delivered, of folder-arms provided above said belt and adapted to engage and raise the edges of the blanks and provided with inwardly-curved sections, means near the receiving ends of said folders for pressing the blanks down upon said belt while their edges are being raised, a pasting device, idle wheels provided between the inwardly-curved sections of said folders and adapted to press the middle portions of the blanks down upon said belt while their sides are being folded thereover, said wheels extending to a point opposite the termination of said inwardly-curved sections, and idle wheels provided near the edges of said belt upon each side of the discharge ends of said folders to receive the folded blanks before they are discharged from beneath said first-named wheels, whereby the progress of said blanks during the folding operation will be rapid and continuous.

3. The combination, with the cutting and scoring rolls, of an endless carrier-belt whereon the cut and scored blanks are delivered, wheels supported above said belt at the edges thereof and adapted to bear upon said blanks between and near the longitudinal scored

lines therein, curved folder-arms provided above said belt, the receiving ends of said arms being outside and near said belt and wheels and adapted to engage the edges and raise the sides of the blanks while the middle or intermediate portions thereof are held upon the belt by said wheels, a device for pasting one edge of the blank provided near the receiving end of one of said folders, the intermediate or middle portions of said folders being inwardly curved toward the middle of said belt and adapted to fold the raised sides of the blanks in over the middle portions thereof, means provided above said belt between the inwardly-turned portions of said folders to hold the middle portions of the blanks flatwise upon said belt while their sides are being folded thereover, said means extending to a point opposite the termination of the inwardly-curved portion of said folders, whereby the rapid continuous feed of the blanks while their sides are being folded is insured.

4. The combination, with the cutting and scoring rolls, of an endless carrier-belt whereon the cut and scored blanks are delivered, wheels supported above said belt and adapted to bear upon said blanks between and near the longitudinal scored lines therein, folder-arms provided above said belt, the receiving ends of said arms being outside and near said wheels and adapted to engage the edges and raise the sides of the blanks while the middle or intermediate portions thereof are held upon the belt by said wheels, means for pasting one edge of the blank provided near the receiving end of one of said folders, the intermediate or middle portions of said folders being inwardly turned toward the middle of said belt and adapted to fold the raised sides of the blanks in over the middle portions thereof, holding and feeding means provided above said belt between the inwardly-turned portions of said folders to press the middle portions of the blanks flatwise upon said belt while their sides are being folded thereover, and wheels provided above said belt upon each side of the discharge ends of said folders to bear upon the blanks and press their pasted edges together, said wheels engaging the blanks before they pass out of contact with said holding and feeding means whereby the progress of the blanks will be rapid and continuous.

5. In a pasting and folding machine for box-blanks, the combination, with the cutting and scoring rolls, of an endless carrier-belt whereon the cut and scored blanks are delivered, a table over which said belt operates, a bracket 18 provided on said table over said belt, bars 22 supported by said bracket near the edges of said belt, and substantially parallel therewith, a series of wheels carried by said bars and adapted to bear upon said blanks between the longitudinal scored lines therein, folder-arms provided above said belt, the receiving ends of said arms being out-

side and near said wheels and adapted to engage the edges and raise the sides of the blanks while the middle or intermediate portions thereof are held down upon the belt by said wheels, a pasting device near the receiving end of one of said folders and adapted to paste or gum one edge of the blanks, the intermediate or middle portions of said folders being inwardly turned over said belt and adapted to fold the raised sides of the blanks in over the middle portions thereof, a second bracket 29, a bar supported thereon and centrally with respect to said belt, a series of wheels carried by said bar and adapted to engage and hold the middle portions of the blanks flatwise upon said belt while their sides are being folded thereover and said folders near their discharge ends being close to said belt and adapted to press the folded sides and edges down upon the middle portions of the blanks and complete the folding operation.

6. In a pasting and folding machine for box-blanks, the combination, with the cutting and scoring rolls, of an endless carrier-belt whereon the cut and scored blanks are delivered, means supported above said belt and adapted to bear upon said blanks between the longitudinal scored lines therein, folder-arms supported above said belt and having their receiving ends in position to engage and raise the edges of the blanks while the middle or intermediate portions thereof are held upon the belt by said bearing means, means provided near the receiving end of one of said folders for pasting an edge of the blank, the intermediate or middle portions of said folders being inwardly turned toward the middle of the belt and adapted to fold the raised edges of the blanks in over the middle portions thereof, spring-pressed idle wheels provided above said belt between the inwardly-turned portions of said folders to hold the middle portions of the blanks flatwise upon said belt while their edges are being folded thereover, the discharge ends of said folders being close to the belt and adapted to complete the folding operation, and spring-pressed idle wheels provided above said belt upon each side of the discharge ends of said folders to bear upon the blanks and press their pasted edges together, substantially as described.

7. In a pasting and folding machine for box-blanks, the combination, with a suitable table, of an endless carrier-belt operating over the same and whereon the cut and scored blanks are delivered, a pasting device, a bracket provided on said table, wheels supported by said bracket and adapted to bear upon the middle portions of the blanks, folder-arms inwardly turned toward the middle of the belt and adapted to fold the upwardly-turned sides of the blanks in over the middle portions thereof, said folder-arms being substantially parallel at their discharge end and adapted to turn down the folded sides

of the blanks and complete the folding operation, a bracket provided on said table near its discharge end, and wheels carried by said last-named bracket upon each side of said folder-arms and adapted to engage the blanks before they are discharged from under said first-named wheels and to press together the folded and pasted edges of the blanks.

8. The combination, with a suitable conveyer, of folder-arms arranged above the same and provided with inwardly-curved sections, and means provided above said conveyer between said inwardly-curved sections to hold the blanks down upon said conveyer and said holding means extending to a point opposite the termination of said inwardly-curved sections to insure the rapid continuous feed of the blanks while their sides are being folded.

9. The combination, with a suitable conveyer, of folding means arranged above the same and converging from their receiving toward their discharge ends, means provided above the middle of said conveyer between said folding means to hold the blanks down upon said conveyer, and means near the said conveyer upon each side of the discharge ends of said folding means in position to receive the folded blanks before they are discharged

from beneath said holding means, whereby the progress of said blanks during the folding operation will be rapid and continuous.

10. The combination, with the cutting and scoring rolls, of a carrier-belt whereon the cut and scored blanks are delivered, folder-arms provided above said belt, the intermediate or middle portions of said arms being inwardly curved toward the middle of said belt and adapted to fold the raised sides of the blanks in over the middle portions thereof, means near the receiving ends of said folders for holding the blanks upon said belt during the operation of raising and turning in their edges, a pasting device, and means provided above the middle of said belt between the inwardly-curved sections of said folders to hold the blanks down upon said belt, and said holding means extending to a point opposite the termination of said inwardly-curved sections to insure the rapid continuous feed of the blanks while their sides are being folded.

In witness whereof I have hereunto set my hand this 22d day of March, 1902.

EDWIN G. STAUDE.

In presence of—

RICHARD PAUL,
M. C. NOONAN.