E. JAGENBERG.

MACHINE FOR MAKING AND CHARGING PAPER BOXES.

APPLICATION FILED OCT. 23, 1913.

**1,125,331.**

Patented Jan. 19, 1915.

3 SHEETS—SHEET 1.

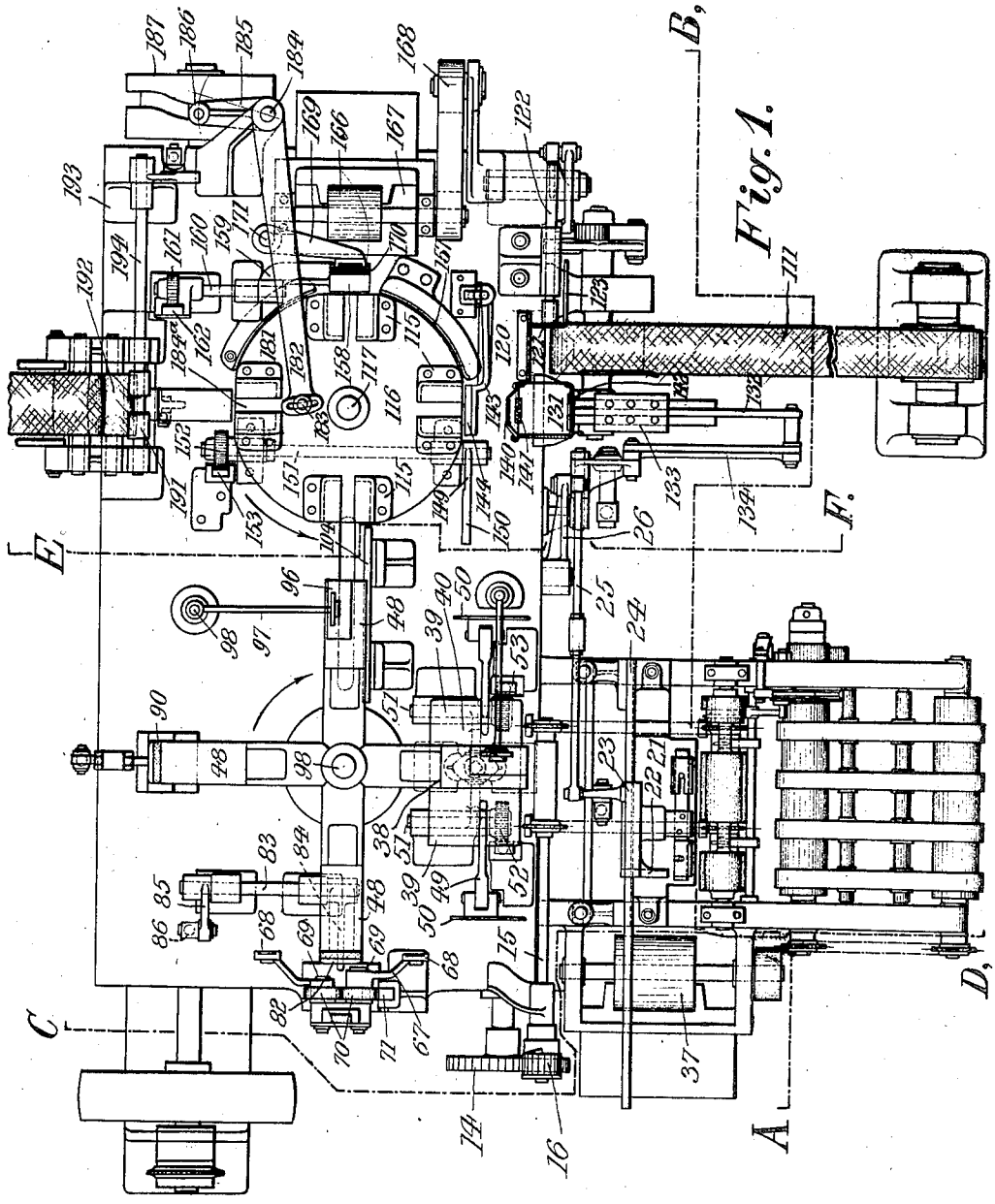



Fig. 1.

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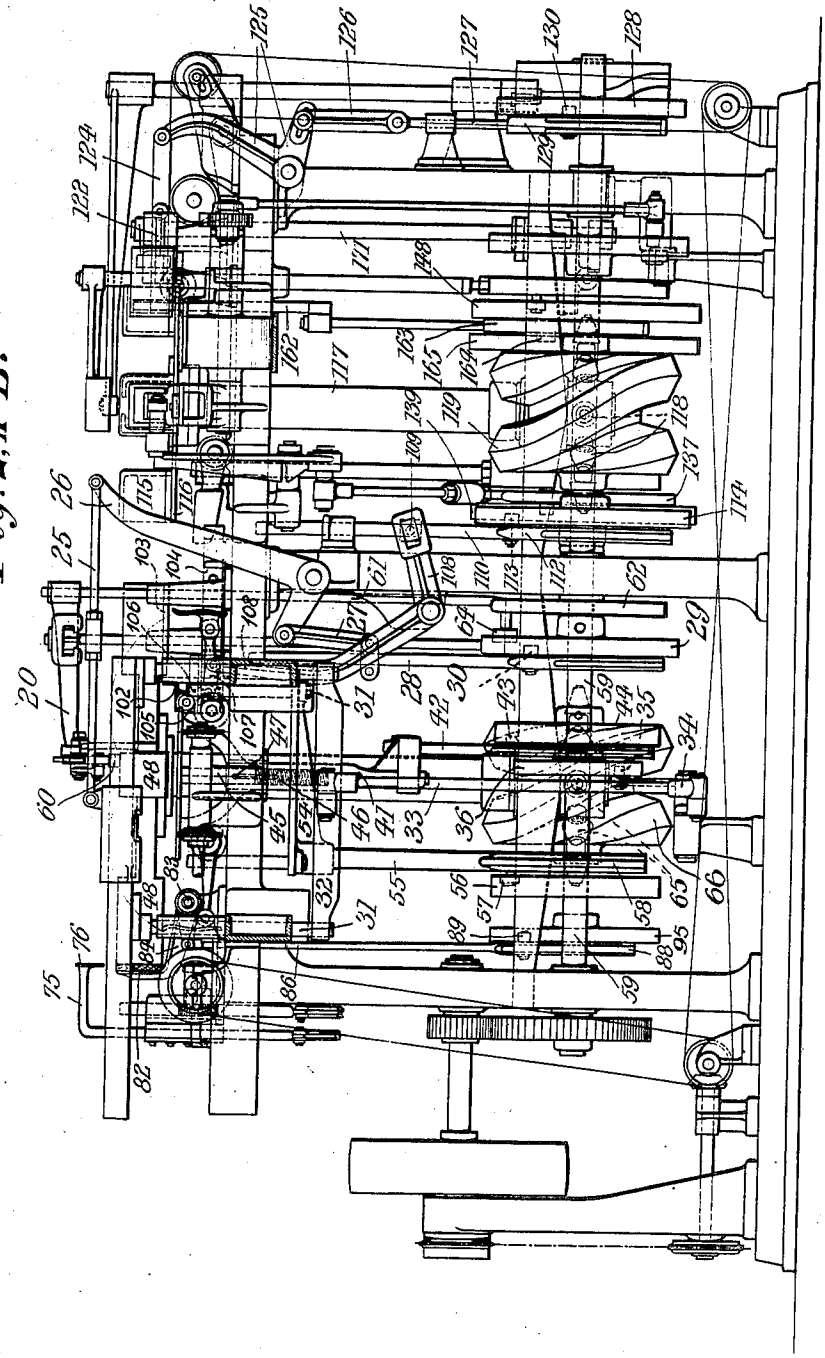
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3 SHEETS—SHEET 2.

*Fig. 2, A-B.*



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3 SHEETS—SHEET 3.

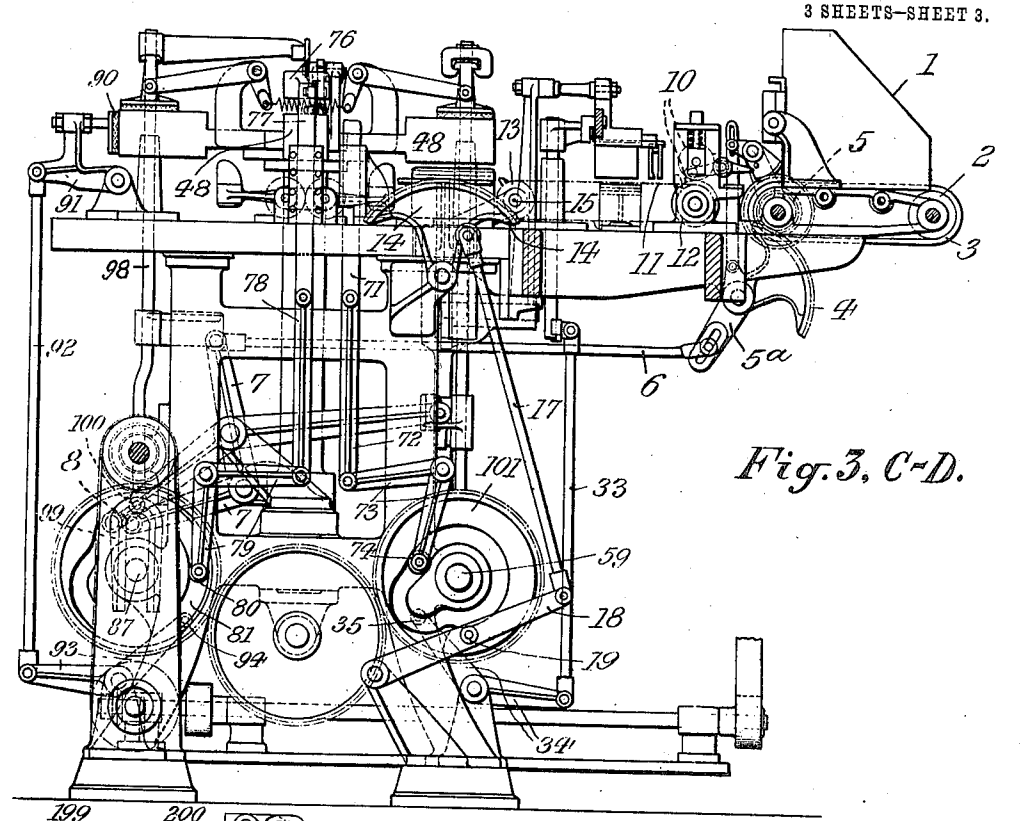



Fig. 3, C-D.

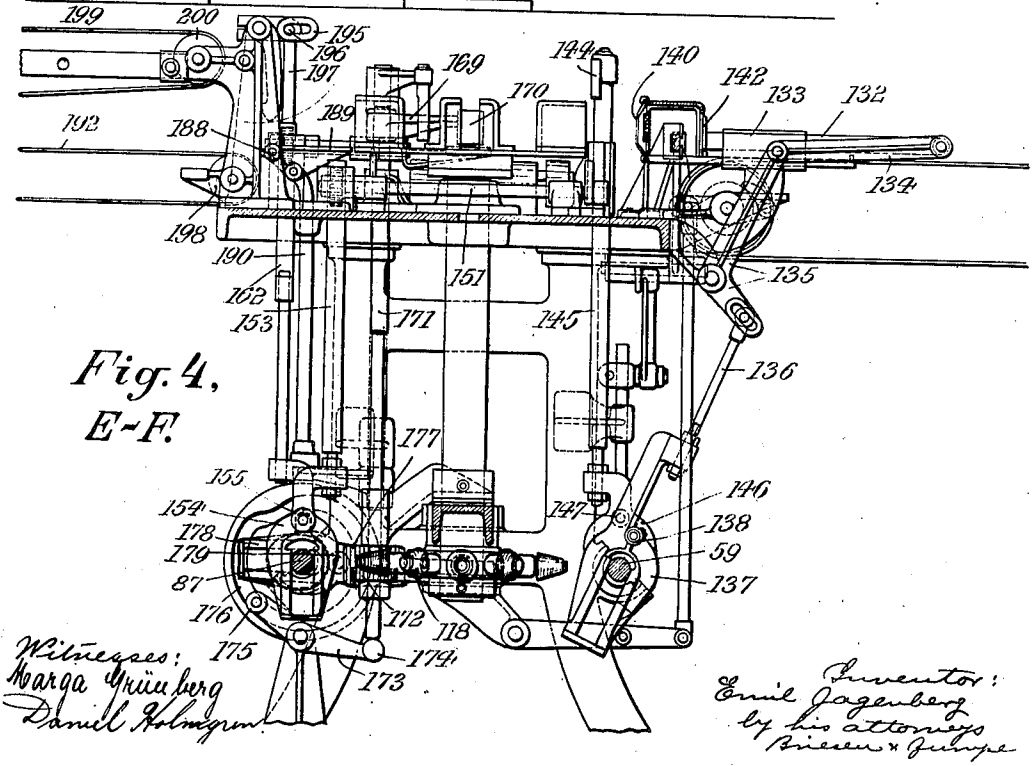



Fig. 4, E-F.

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# UNITED STATES PATENT OFFICE.

EMIL JAGENBERG, OF DUSSELDORF, GERMANY.

## MACHINE FOR MAKING AND CHARGING PAPER BOXES.

1,125,331. Specification of Letters Patent. Patented Jan. 19, 1915.

Application filed October 23, 1913. Serial No. 796,754.

*To all whom it may concern:*

Be it known that I, EMIL JAGENBERG, a citizen of the Empire of Germany, residing at Dusseldorf, Germany, have invented new and useful Improvements in Machines for Making and Charging Paper Boxes, of which the following is a specification.

This invention relates to a machine for making paper boxes, and for filling said boxes with articles such as butter, soap or cigarettes wrapped up in paper. The machine forms the cut out paper blanks into boxes, into which the inwrapped articles are automatically pushed, after which the boxes are closed.

With this machine the advantage is obtained, that without any manual labor, say forty or more boxes may be produced, charged and closed in a single minute, during which operation it is merely necessary to feed the articles to the machine.

In the accompanying drawing: Figure 1 is a plan of a machine embodying my invention; Fig. 2 a longitudinal section on line A, B, Fig. 1, Fig. 3 a cross section on line C, D, Fig. 1, and Fig. 4 a cross section on line E, F, Fig. 1.

The cardboard blanks, slitted in known manner are arranged in a stack 1, and rest upon a feed apron 3 that runs over rollers 2, to which intermittent motion is imparted, so that the bottom blank is drawn off the stack. This movement is imparted to the apron by means of a toothed sector 4, which engages a pinion 5 fast on one of the roller-shafts, and which is so actuated by arm $5^a$, rod 6, and elbow lever 7 having cam roller 8, from a suitable cam, that no movement is transmitted to the rollers, during the return movement of the sector. The segregated blank is drawn between a pair of rollers 10, and is thence delivered to endless feed chains 11, running over sprocket wheels 12, 13, and actuated by a toothed sector 14 which engages a pinion 16 fast on the shaft 15 of wheel 13. Sector 14, is so actuated from cam 101, by rod 17 and lever 18 having cam roller 19, that no movement is transmitted to shaft 15, during the return movement of sector 14. Feed chains 11, convey the blank to a table 21, where it will come to rest for a short period, owing to the arrest of the chains. During this time the blank is provided with an adhesive, by means of a plunger 22, fast on a slide 23 which is movable along a rail 24, and is reciprocated by rod 25, angle lever 26, link 27, and rod 28 which carries a roller 30, engaging cam 29. Rail 24 is supported by two rods 31, which are slidably mounted, and are connected at their lower ends to a cross-piece 32, which is vertically reciprocated by rod 33, and angle lever 34 carrying a roller 35, that engages cam disk 36. Slide 23 together with plunger 22, is moved sidewise by rod 25, and is then by the depression of rods 31, lowered upon a rotating gluing roller 37 after which it is again raised, moved inwardly over table 21, and lowered upon the blank supported thereon, so that the latter is provided with the adhesive at the places desired. After this operation, the blank is by chains 11, moved upon a second table composed of a central plate or section 38, and a pair of end plates or sections 39. The latter are by arms 40 secured to a slidable hollow post 41, which is reciprocated by rod 42, having roller 43, that engages cam disk 44. The central table section 38 is fast on a post 45 slidable within the bore of post 41, and supported by a spring 46. A pin 47 on post 45, engaging a slot of post 41 prevents spring 46 from elevating plate 38, above the level of plates 39. When the blank is delivered to plates 38, 39, such plates are raised, to press the blank against a beam or core 48, located above the central plate 38. In this way the further rise of plate 38 is checked, while plates 39 will move upward along the sides of the core, so as to fold those parts of the blank which are supported by the side plates 39, against the core sides. Arms 49 carrying plates 50 will now swing upward, so as to fold those parts of the blank that project above the core against the upper side of the latter. Arms 49 are fast on shafts 51, carrying gear wheels 52, which are engaged by racks 53. The latter are provided with an arm 54 mounted upon a rod 55, having a roller 57 that engages cam disk 56, the forked end 58 of the rod straddling the shaft 59 of the cam disk. After the arms have effected their folding operation, the plates 50 are retracted, and immediately thereafter, a plunger 60 carried by an arm 20 is lowered, so as to press the top of the blank against the upper side of the core, and thus cause the overlapping blank edges to be glued together, by means of the adhesive. Arm 20 is fast on a slidable rod 61 having a lower forked end 62 which straddles shaft 59,

while a roller 64 of the rod engages cam disk 29.

Four cores 48 are provided which are mounted in star-shape upon a rotatable shaft 98, having rollers 65 that engage a cam disk 66, which causes the shaft to be intermittently rotated through an angle of 90°. When the blank of any one core is glued by plunger 60, shaft 98 is turned 90°, so that the next core arrives over plate 38 (which has meanwhile descended together with plates 39), so as to be in position for the folding of the succeeding blank, while the old blank is carried to a further folding device. This last named device is composed of two plates 68 secured to arms 67 that are mounted on shafts 69, and are swung upward by intergeared wheels 70 mounted on such shafts. One of the wheels 70 is engaged by a rack 71, which is actuated by rod 72 and angle lever 73 having roller 74, that engages cam 101. When plates 68 are simultaneously swung upward and inward, they strike the vertical parts of the blank that project beyond the end of the core, the blank being here slitted at its edges, to form four separate flaps. The two vertically positioned flaps are thus turned inwardly and made to overlap each other, over the end of the core. A vertically disposed plate 76 secured to an arm 75 is then lowered along the end of the core, so as to fold the upper flap upon the side flaps, after plates 68 have receded. Arm 75 is carried by a slidable rod 77, which is operated by rod 78 and an angle lever 79 having a roller 80, that engages cam disk 81. When plate 76 has arrived at its lowermost position, a further plate 82 begins to rise and to engage the lower flap of the blank, which during the recession of plate 76, is by plate 82 folded against the three previously folded flaps. Plate 82 is fast on an arm 84 mounted on shaft 83. This shaft further carries a lever 85 connected to a rod 86, which with its lower forked end 88 straddles shaft 87, while a roller 89 on the rod engages a cam disk 95 fast on said shaft. Thus plate 82 is raised by the rotation of the cam disk, and is firmly pressed against the end of core 48, so that the bottom flap which is provided with the adhesive is glued to the top flap, whereby a box with a closed bottom will be now mounted on the core. After plate 82 has receded, shaft 98 is again turned 90°, so that the core with the box is presented to a plunger 90, which imparts to the bottom flaps an additional pressure. Plunger 90 is carried by an angle lever 91, which by rod 92 is connected to an angle lever 93 having roller 94 that engages a suitable cam disk. Next shaft 98 is again turned 90° so that the core together with the box will be swung underneath a plate 96, which is lowered upon the core and again compresses the longitudinal seam. Plate 96 is fast on an arm 97, of a slidable rod 98a, which with its lower forked end 99 straddles shaft 87, and carries a roller 100 that engages cam 101. After plate 96 has been raised, a stripper 102 engages the end of the box and shoves the latter off core 48, the stripper moving along a groove 103, and being rotatably secured to a slide 105 moving in guide 104. A lever 106 is connected to stripper 102, which by link 107 is connected to an elbow lever 108. The free arm of this lever is provided with a slot that is engaged by the bolt 109 of a slidable rod 110 the lower forked end 112 of which straddles shaft 59, while a roller 113 on the rod engages a cam disk 114 mounted on said shaft. When slide 105 is moved toward the box, lever 106 will raise stripper 102 and press it into groove 103, along which it glides so as to shove the box off the core. In this way the box is projected with its closed end into a casing 115 which is located directly opposite core 48, and is mounted on a turning table 116. This table is furnished with four of said casings and is fitted to a vertical shaft 117, which is intermittently rotated through 90°, by means of a cycle of rollers 118 engaging a cam disk 119. After the box has been pushed into the facing casing 115, the latter is turned 90° in the direction of the arrow Fig. 1, such movement being accompanied by a simultaneous turning of core 48, so that, at each period of rest, a casing 115 will be opposed to a core 48. By the turning of the casing, the box arrives opposite means for sliding a charge into the box, the goods comprising this charge being carried to the machine by means of a conveyer feed belt 111. The foremost article strikes an abutment or wall 120, so that the belt will continue to move underneath it. Then a plate 121 which is secured to a slidable rod 122 is so moved, that the article is pushed sidewise away from the belt. Plate 121 is furnished with a rearward extension 123, which will become engaged by the next article carried by conveyer 111. Rod 122 is by link 124 connected to an angle lever 125, which by link 126 is connected to a sliding rod 127 having a fork 129 that straddles a shaft 59, while a roller 130 of the fork, engages a cam disk 128 fast on the shaft.

By means of plate 121 the article to be packed is slid into a container 131 which is open on this side and is rigidly mounted on the machine table. That side of the container 131 which faces casing 115, is likewise open, and this open side is provided with four hinged wings 140 having beveled edges, the wings being adapted to be pressed inward by springs 141. After the article has been pushed into container 131 by plate 121, the latter is retracted, and then a plate 142 located at the back of the container is

advanced, to push the article out of the container and into the box. Plate 142 is secured to a slidable rod 132, that engages a guide 133, the rear end of the rod being by rod 134 joined to an angle lever 135. This lever is linked to a rod 136, having a fork 137 that straddles shaft 59, and a roller 138, that engages a cam disk 139 fast on said shaft. During the introduction of the charge into the box, the wings 140 are swung outward, and will thus bear against the inner sides of the oppositely positioned flaps of the box cover, so as to bend them somewhat outwardly, and permit the free entry of the charge into the box. Plate 142 is then retracted, while a plate 144, is lowered from above to fold down anl close the upper cover flap. Plate 144 is carried by an arm 143 of a slidable rod 145, having fork 146 that straddles shaft 59, and a roller 147 engaging a cam 148 carried by said shaft. Shortly before plate 144 is again raised, a side plate 150 secured to an arm 149 is swung forward, so as to engage one of the side flaps of the box cover and turn the same inward against the folded top flap. Arm 149 is carried by a rotary shaft 151, on which is mounted a cog wheel 152, engaged by a rack 153. This rack is provided with a fork 154 that straddles shaft 87, and carries a roller 155 engaging a cam mounted on said shaft. When arm 149 commences its return movement, table 116 will again turn 90°, during which movement, that part of the box that projects beyond casing 115, will strike a curved abutment 157, by means of which the other side flap of the box cover will be closed. After the completion of this turning movement of the table, the bottom flap only of the box cover will remain open. This bottom flap will in this position of the table be carried above a plate 158 fast on the arm 159 of a rotatable shaft 160. This shaft carries a toothed wheel 161 engaged by a rack 162 having a fork 163 that straddles shaft 87, and a roller 164 engaging a cam 165 fast on said shaft. In proximity to plate 158 there is arranged a gluing roller 166 turning in a glue pot 167 and operated by a belt 168. Above roller 166 there is free to turn an arm 169 carrying a dab 170, which impinges against the roller, and is adapted to convey the adhesive to the lower box flap. Arm 169 is secured to a rotatable and slidable shaft 171, carrying a toothed wheel 172, and supported on the ball shaped end 174 of an elbow lever 173. The latter is provided with a roller 175 engaging a cam 176, while toothed wheel 172 engages a rack 177 of a slidable fork 178, that straddles shaft 87. Fork 178 carries a roller 179 that engages a suitable cam fast on shaft 87. The width of rack 177 is such that in spite of the displacement of wheel 172 along with shaft 171, the wheel will always maintain its engagement with the rack. The dab 170 is therefore by the sliding movement of fork 178 oscillated above gluing roller 166, and is then, by the turning of the angle lever 173, lowered upon the bottom flap of the box cover, to be again raised and moved outwardly. Plate 158 is now raised by the rack 162, so that the bottom flap is pressed against the previously closed three cover flaps and glued to the same. The table 116 will then again turn 90°, during which movement that part of the box that projects beyond casing 115, will be caused to strike a curved abutment 181, for the purpose of pressing the cover flaps tightly together and thus effect their intimate union. After the rotation of the table as described, the casing 115 with the closed box will face a stripper 183 carried by the long arm 182 of a rotatable shaft 184. The latter is provided with a crank 185 having a roller 186 that engages a cam 187, by the rotation of which arm 182 is swung to cause stripper 183, to enter a slit 184[a] of casing 115 and thus press the box out of the casing. The box will be received upon a plate 189 turning on pivot 188, and jointed to a rod 190, which is operated from shaft 87, by means of a roller and cam (not shown). When plate 189 is raised, the box supported thereby is by oscillative arms 191 tilted off the same and upon a conveyer belt 192, where the box arrives in such a position that one of its heads will rest upon the same. Arms 191 are fast on a shaft 194 journaled in a bearing 193 and carrying a slotted lever 195, which by pin 196 is connected to a slidable rod 197. The latter is operated from shaft 87 by a cam and roller (not shown).

Above conveyer belt 192 running over pulley 198, is arranged a second conveyer belt 199 running over pulley 200 and moving with a like speed. The two conveyers move with their opposed faces in the same direction, *i. e.* away from the machine. The box tipped upon the lower belt 192, is thus drawn by the same underneath the upper belt, and is thus carried off by both belts. During this movement the lower belt will press against the flaps of one box head, while the upper belt will press against the flaps of the other box head, so that the same are not liable to spring open, and that the box when leaving the conveyers is perfectly dry and securely closed.

I claim:

1. A machine of the character described, comprising means for making a paper box having cover flaps, a casing, means for introducing the box in an open condition into the casing, a charge conveying belt, a container having wings adapted to engage the cover flaps, means for feeding the charge

from the belt into the container, means for swinging the container wings against the box flaps, and means for closing the box.

2. A machine of the character described, comprising means for making a paper box having cover flaps, a casing, means for introducing the box in an open condition into the casing, a charge conveying belt, a container having wings adapted to engage the cover flaps, means for feeding the charge from the belt into the container, means for swinging the container wings against the box flaps, means for closing the box, a tiltable plate, means for transferring the box from the casing to said plate, a pair of superposed charge delivery belts, and means for transferring the box to said belts.

In witness whereof I have hereunto set my name this 16th day of October, 1913.

EMIL JAGENBERG.

Witnesses:
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