

No. 833,329.

PATENTED OCT. 16, 1906.

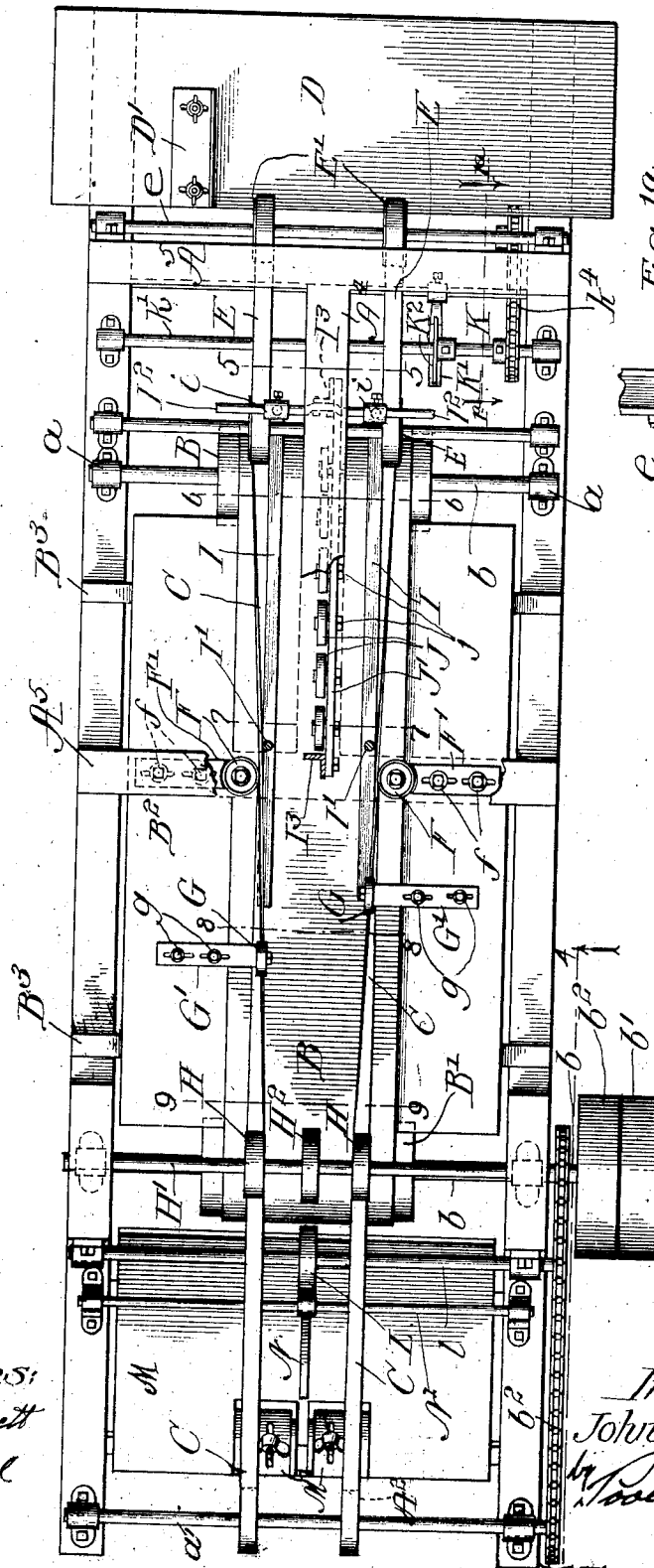
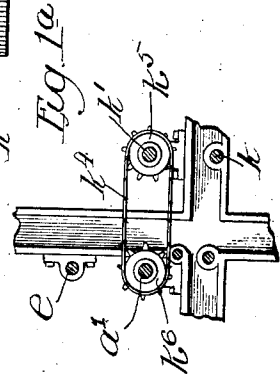
J. W. LOW.

MACHINE FOR FOLDING AND PASTING PASTEBOARD BOXES.

APPLICATION FILED AUG. 1, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



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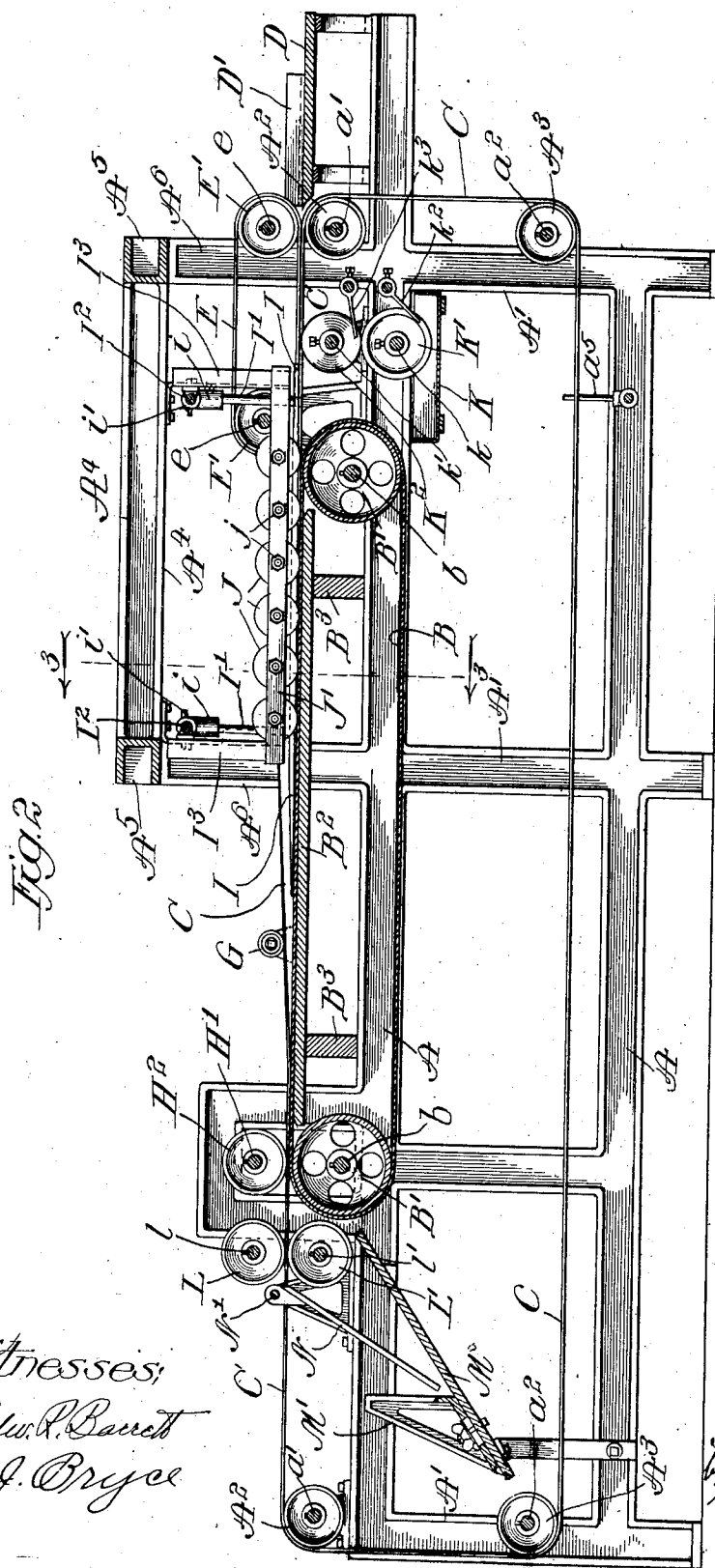
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3 SHEETS—SHEET 2.



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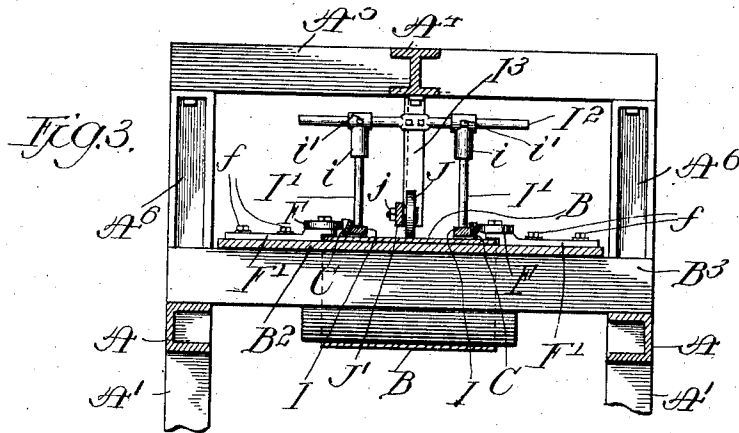
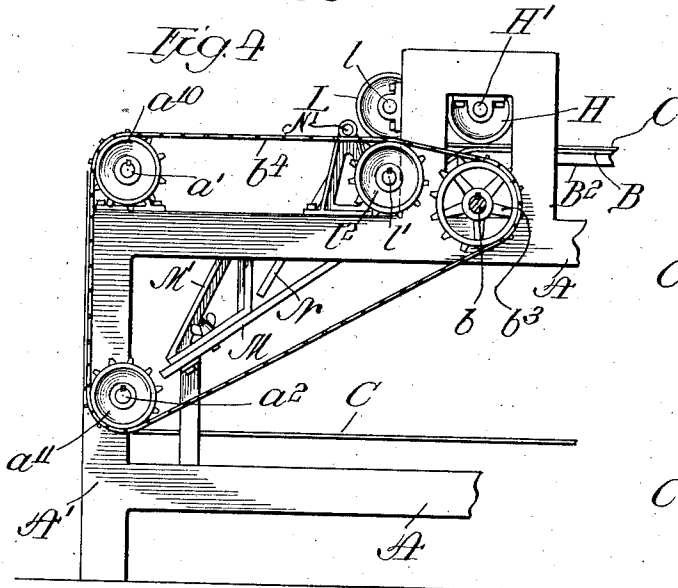
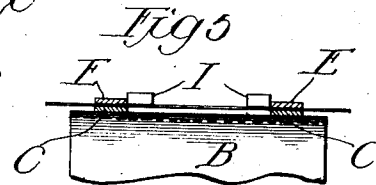
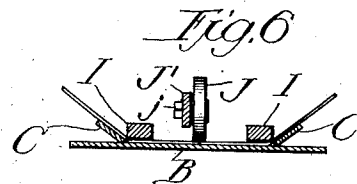
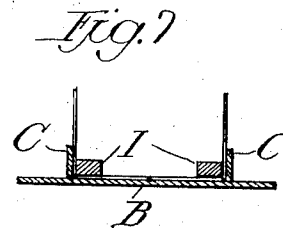
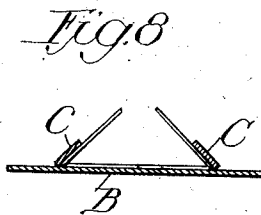
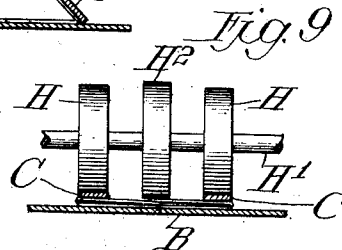
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APPLICATION FILED AUG. 1, 1904.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN W. LOW, OF CHICAGO, ILLINOIS, ASSIGNOR TO CARRIER LOW COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR FOLDING AND PASTING PASTEBOARD BOXES.

No. 833,329.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed August 1, 1904. Serial No. 219,068.

To all whom it may concern:

Be it known that I, JOHN W. LOW, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Folding and Pasting Pasteboard Boxes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for folding and pasting pasteboard boxes or cartons, the box being folded from a flat, properly cut, and scored blank to tubular form and pasted at its meeting edges while flat and thereafter opened into tubular form to constitute the carton or box.

Among the objects of the invention is to simplify the construction and operation of a machine for this purpose and to increase the capacity of such machine, and thereby reduce the cost of operating the same and the cost of the folded and pasted boxes.

As shown in the drawings, Figure 1 is a plan view with parts broken away of a machine for the purpose set forth made in accordance with my invention. Fig. 1^a is a section taken on line 1^a 1^a of Fig. 1. Fig. 2 is a vertical longitudinal section of the machine. Fig. 3 is a vertical transverse section taken on line 3 3 of Fig. 2. Fig. 4 is a vertical section and elevation taken on line 4 4 of Fig. 1. Figs. 5, 6, 7, 8, and 9 indicate the steps which the blank assumes while being formed into a box, said views being taken on lines 5 5, 6 6, 7 7, 8 8, and 9 9 of Fig. 1.

The particular folding and pasting machine illustrating one embodiment of my invention embraces in general terms a wide endless forwarding-belt trained about suitable pulleys and constituting the support for the blanks as they pass through the machine and two endless forming-belts located one at each side of and traveling for a distance in contact with the forwarding-belt and preferably at an equal speed therewith. The said forming-belts in the parts thereof which travel in contact with the forwarding and supporting belt are twisted in a manner to give the same a spiral or plowshare form thereto, so that as the blanks are carried along between the forwarding and supporting

ing belt beneath and the forming-belts above the side sections or margins of the blank are folded toward each other and one upon the other.

Near the feed end of the machine is located a pasting device by which is applied to one of the sections of the blank a strip of paste by which the margins of the blank are pasted together when the blank has been folded flat. The machine is preferably made adjustable to operate on blanks scored to produce various size boxes.

The machine is herein shown as adapted for folding and pasting from flat suitably-scored blanks elongated tubular cartons of rectangular cross-section. A machine for folding such boxes and the manner of folding the box is shown in the prior patent granted to myself and Roy J. Carrier, No. 705,206, dated July 22, 1902. The blank from which said box is made consists of a single piece of sheet material which is scored to form four parallel sections, one for each of the walls of the tubular box when formed, and the two side sections are first folded upwardly, while the intermediate sections remain flat, said folding side sections being folded toward each other with the margin of one overlapping the margin of the other, to the lowermost one of which overlapping margins has previously been applied a strip of paste.

Referring now to the particular machine in which my improvements are shown as embodied, the frame consists of two side parts embracing longitudinal, horizontal, and vertical members A A', joined by transverse members. (Not shown.)

B designates an endless wide forwarding-belt, the upper lap of which constitutes the support for the blanks as they pass through the machine and are given form. Said belt or conveyor is trained about horizontal pulleys B' B', the shafts *b* of which are rotatively mounted in bearings *a* on the upper longitudinal members of the machine-frame. Said belt is driven by power applied through the medium of fast and loose pulleys *b'* *b'* on one of the shafts *b* of the pulleys B'. The upper lap of the forwarding and supporting belt is preferably supported by a flat horizontal board B², considerably wider than the belt, and said board is supported on the upper longitudinal members of the frame through the

medium of vertical cross-bars B³. (Shown in Fig. 2.)

C C designate the forming-belts, located near the side margins of the upper lap of the forwarding-belt, Figs. 1 and 3, and traveling in contact and in the same direction therewith and preferably at the same speed. Said forming-belts are trained about pulleys A² A² and A³ A³, mounted on shafts a' a', which have suitable bearings in the side members of the machine-frame. The pulleys A², one at each end of the machine, are located at such level as to bring the upper laps of the forming-belts at a height to travel in contact with the forwarding and supporting belt B, as before stated.

D designates a horizontal feeding-table located at the level of the upper laps of the forming-belts at the feed end of the machine, said upper laps of the forming-belts being at this place horizontal.

E E designate a pair of feeding-belts the lower laps of which travel for a short distance in contact with the horizontal parts of the upper laps of the forming-belts at the feed end of the machine and between which belts the blanks are received and carried into the machine. Said feeding-belts E are trained about rotative pulleys E' E', the horizontal transverse shafts e of which are mounted in suitable bearing in the machine-frame. Said pulleys E' E' and the pulleys A² A³ are movable longitudinally of their shafts, whereby the forming and feeding belts may be moved toward and from each other to adjust the machine to wider or narrower blanks, as desired. The said forming-belts extend at both the forward and rear ends of the machine some distance beyond the supporting-rollers B' for the forwarding and supporting belts.

Between the forward pulleys E' of the feeding-belts E and the forward pulley B' for the supporting and forwarding belt the forming-belts C are turned or twisted one-half round, thereby giving to the same a spiral form and which acts upon the side sections of the scored blank, hereinbefore referred to, to fold the same, first upwardly, then toward each other, and, lastly, downwardly one over the other in overlapping contact. The said forming-belts are thus twisted by means of suitable pulleys engaging the same at different parts of their length. The parts of the forming-belts passing beneath the feeding-belts E are flat. Located in front of said feeding-belts are two pulleys F F, which rotate on vertical axes and are carried by horizontal blocks F', which are supported on the horizontal board B², before referred to. Said pulleys F cause the belt to assume a vertical position at the points engaged by the pulleys and to rise or be twisted gradually from a horizontal to a vertical position between the feed-belts E and pulleys F. Located in front of said pulleys F are

another pair of pulleys G G, which rotate on horizontal axes and are rotatively mounted on the inner ends of horizontal blocks G', that are fastened to the upper face of the support or board B² for the belt. Said pulleys G engage the upper margins of the forming-belts in a manner to turn the same from the vertical positions into which they are brought by the pulleys F toward each other at their upper margins, and thereby assume inwardly-inclined positions. Inasmuch as one side section of the blank should be turned inwardly and downwardly before the opposite section in order that there be no interference when being folded downwardly, one of the pulleys G is set in advance of the other, as shown in Fig. 1. Said forming-belts C are brought to horizontal flat positions by means of pulleys H H, which are affixed to a transverse horizontal shaft H', that extends transversely across the machine and which is mounted in suitable bearings in the side members of the machine-frame. Said pulleys H therefore rotate about a horizontal axis and press the forming-belt flatwise against the forwarding and supporting belt B. From the pulleys H the forming-belts C retain their flat horizontal positions to the pulleys A² at the ends of the machine and retain such positions over the pulleys A³ A³ and back to the pulley A² at the feed end of the machine. The lower laps of the forming-belts engage guides a⁵, Fig. 2, to hold the same properly alined with the pulleys A³ at the feed end of the machine.

It will be observed from the foregoing that the forming-belts C are given a one-half twist in the parts thereof from the feed-belts E to the pulleys H H. The pulleys H also have the effect of pressing the folded joints of the boxes before they are discharged from the machine.

Located at the inner margins of the forming-belts from points adjacent to the feeding-belts E and extending forwardly to the neighborhood of the vertical guide-pulleys G are two parallel bars I I. Said bars are fixed to the lower ends of vertical rods I' I', there being two rods associated with each bar, as herein shown, one attached near the rear and the other near the front end of the bar. Said rods I' are provided at their upper ends with heads i i, which are provided with transverse apertures that slide on two horizontal parallel rods I² I², located transversely above the belts B and C and attached in any suitable manner to an overhead part of the machine-frame. As herein shown, said rods I² are attached to vertical bars I, Figs. 2 and 3, which latter are attached at their upper ends to and depend from a centrally-located longitudinally-disposed beam A⁴, that extends between and is attached at its ends to transverse beams A⁵ A⁵, located above the forwarding and forming belts and supported on

the upper ends of extensions A⁸ of the vertical members A' of the machine-frame. The said bars I' are so located that the planes of the outer surfaces thereof are in line with the score-lines between the outer folding sections of the blank and the intermediate flat sections. The blanks are fed beneath the rear ends of said bars and between the same and the forwarding-belt. As the forming-belts begin to turn or twist, however, due to the action of the pulleys F, they fold the outer sections or flaps of the blank upwardly about the inner surfaces of the bars I until said folding sections or flaps assume vertical positions, which occurs just before the blanks reach the guide-pulleys F. The bars serve not only as means affording vertical surfaces about which the side or folding flaps are folded, but also as means serving to prevent the blank from rising off the forwarding and supporting belt. Said bars follow the belts C to the point where the belts pass from a vertical to an inwardly-inclined position, and thereafter the inclination of the belts folds the flaps inwardly, and it is prevented from rising by the overhanging of the inwardly-inclined parts of the belts.

In order to prevent the intermediate parts or sections of the blank from rising while the outer sections or flaps are being folded upwardly and inwardly in the manner described, I may employ a series of presser-rollers J J, rotatively mounted on a series of horizontal studs j, that are fixed in a horizontal longitudinally-arranged bar J', that is attached at its end to the vertical bars I³, before referred to.

The forming-belts C C and the parts associated therewith to fold the guide margins or flaps of the blank as they are passed through the machine are arranged to be adjusted to fold boxes of different widths. For this purpose the blocks F' G', carrying the belt-directing pulleys F and G, are attached to the support B² by means permitting the same to be moved toward and from each other. As herein shown, said blocks are attached to the support by means of set-screws f g, extending through elongated longitudinal slots in the blocks. The bars I I are similarly designed to be moved toward and from each other to follow the forming-belt, and for this purpose the apertured heads i, by which said rods I' are attached to the horizontal transverse rods I², have sliding engagement with said rods I² and are fixed thereto by means of set-screws i' i'. The pulleys H H, A², and A³, about which the forming-belts C travel, are also adjustable longitudinally of their shafts and are attached thereto by set-screws in the manner shown, whereby they may be moved toward and from each other to correspond with the lateral adjustment of the forming-belts.

The forming-belts are driven from the

main driving-shaft b of the front roller B' by means of a sprocket-wheel b⁸ on said shaft, sprocket-wheels a¹⁰ a¹¹ on the shafts a' a' at the front end of the machine, and a sprocket-belt b⁴, trained about said sprocket-wheels, 70 as shown in Fig. 4.

Means are provided for applying a strip of paste to one of the marginal flaps or sections of the blank, whereby when the flaps of the blank are folded together they will adhere to each other. Said paste-applying means are made as follows:

K designates a receptacle which is located below the level of the feeding-belt at the feed end of the machine and adapted to contain a body of paste in liquid form. K' designates a rotative feeding-disk which is fixed to a transverse horizontal shaft k, rotatively mounted in the machine-frame, and the disk is adapted to dip into the liquid paste in said receptacle K.

K² designates a thin paste-applying disk which rotates with its periphery in contact with the wider paste-feeding disk and is adapted to rotate at its upper side against the lower face of the blanks as they pass the same, so as to apply a line of paste to each blank. Said paste-applying disk is fixed to a horizontal rotative shaft k', parallel with and above the shaft k. k² k³ designate scrapers which engage the peripheries of said disks and prevent the accumulation of paste thereon in a manner to apply paste irregularly to the blanks as they pass thereover. The said paste-receptacle K is made of considerable length transversely of the machine, and the disks K' K² are adapted to be adjusted longitudinally of their shafts by means of the set-screws shown, so that said disks will always be in proper position to apply the paste to the blank in all lateral adjustments of the machine. The shaft k', on which the paste-applying roller is mounted, is geared to the adjacent shaft a' to impart rotation to said paste-applying disk and its shaft. The driving connections between the shaft a' and the shaft k' of the said paste-applying disk consists of a sprocket-chain k⁴, trained about sprocket-wheels k⁵ k⁶ on said shafts, Fig. 1^a. The paste-feeding disk is rotated by its peripheral engagement with the paste-applying disk.

After the marginal flaps of the blank have been pressed downwardly upon each other they are passed beneath a pressing-roller H² that is mounted on the shaft H and pressed between said roller and the forwarding-belt B. The folded shell after passing between said pressing-roller H² and belt B² passes between squeezing-rollers L L', located one over the other in front of and in line with the roller H², and the pasted joint is passed between said squeezing-rollers to further set the joint. Said rollers are mounted on horizontal shafts l l', that extend transversely across

the machine, and said shafts have bearing in the frame of the machine in the manner shown in Figs. 1 and 4. The lower shaft I' is provided at its end adjacent to the fast and loose pulleys b' b^2 with a sprocket-wheel l^2 , which is engaged by the belt b^4 and by which the shaft I' and lower squeezing-roller L' are given rotation.

A slanting receiving-board M is provided at the discharge end of the machine, located just in front of the squeezing-rollers L L' and upon which the folded boxes are discharged. Said board is provided with a stop consisting of brackets M' M' , rising vertically therefrom at the lower side thereof. A weighted lever N is provided, which is loosely or rotatively connected with a transverse horizontal shaft N' , that extends across and has bearing in the side members of the machine-frame in front of the squeezing-rollers. The forward or free end of said bar N is adapted to press downwardly on the bundle of folded boxes, which accumulate upon the receiving-board M , and said lever is weighted, so as to hold the folded boxes in a compact bundle until removed from the machine. The stop-brackets M' are separated, so as to permit the lever to be made sufficiently long to engage the folded boxes near the lower edges thereof and still permit said lever to be swung upwardly as the bundle increases by the addition of boxes thereto.

The feed-board D is provided with a laterally-adjustable gage-plate D' , located at one side of the path of the blanks as they are fed into the machine. Said gage-plate engages the margins of the blanks and enables the blanks to be properly fed into the machine, so that the score-lines about which the side sections or flaps are folded upwardly are brought into register with the side margins of the bars I without special care being required of the operator to effect this result.

The stages by which the marginal sections or flaps of the blank are folded upwardly to bring the box into its closed or tubular form as it passes through the machine are indicated more clearly in Figs. 5 to 9, both inclusive. In Fig. 5 the blank is shown in its flat position while passing between the feeding-belts E and the forming-belts C . In Fig. 6 is shown the position which the side sections or flaps assume with respect to the forming-belts and to the bars I as soon as the forming-belts begin to turn toward vertical positions. In Fig. 7 is shown the position of such parts when the blank has reached that part of its path of movement when the forming-belts are vertical. In Fig. 8 is shown the position of the blank and the forming-belts after the upper margin of the forming-belts begin to turn toward each other and downwardly against the supporting or forwarding belt B , and in Fig. 9 is shown the position of the blank and the belts after the forming-belts

have been turned half over or again lie flat upon the forwarding and supporting belt B . In this figure is also shown the pressing-roller H^2 relatively to the pasted joint of the box. In this manner it will be seen that the transition from a flat blank to a pasted tubular box or shell is continuous and gradual. It will be further observed that by reason of the fact that the forming-belts travel with the supporting and forwarding belt and preferably at the same speed that such turning of the marginal flaps is accomplished practically without friction between the belts and the blank or shell. For this reason less power is required to direct the blank or shell through the machine, and there is less liability of the blank or shell sticking in the machine by reason of undue friction, such as would be true if the forming parts were stationary and the belt B or equivalent part were movable. The machine herein shown is exceedingly simple in its construction and operation, requiring little power to operate the same, and is free from complex mechanisms which are likely to get out of order.

While I have herein shown a form of machine embodying the improvements constituting my invention which I have found to be commercially practical, yet it is to be understood that my invention may assume widely different forms, while retaining the essence or spirit thereof. I do not wish, therefore, to be limited to the particular construction illustrated except as hereinafter made the subject of specific claims.

I claim as my invention—

1. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt throughout the length of its active surface inside the planes of the side margins of said upper lap, and through the medium of which belts alone the side flaps of the blank are folded inwardly and downwardly on the bodies of the blanks.

2. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt throughout the length and inside the planes of the side margins of the said upper lap, for the purpose set forth.

3. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt throughout the length of said upper lap, for the purpose set forth, said forming-belts extending beyond the upper lap of the forwarding-belt at the feed end of the machine to deliver box-blanks to the forwarding-belt.

4. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in con-

tact with the upper lap of the forwarding-belt throughout the length of said upper lap inside the planes of the side margins of said forwarding-belt, and pressing-rollers located over the forwarding-belt at the receiving end of the machine for pressing the blanks against the forwarding-belt.

5 5. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt throughout the length of said upper lap, for the purpose set forth, said forming-belts extending beyond the upper lap of the forwarding-belt at the feed end of the machine, and upper feed-belts coacting with the extended parts of the forming-belts, between which and the forming-belts the blanks are delivered to the forwarding-belt.

20 6. In a machine for the purpose set forth, the combination with a forwarding-belt, of two forming-belts traveling in contact with the side margins of the upper lap of the forwarding-belt, said forming-belts lying flat on the upper lap of the forwarding-belt at the receiving and discharge ends of the machine, and means engaging the forming-belts intermediate their ends to twist said belts, for the purpose set forth.

30 7. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt inside the planes of the side margins thereof throughout the length of said upper lap of the belt, and means for applying paste to said blanks before they are folded.

40 8. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt inside the planes of the side margins thereof throughout the length of said upper lap of the belt, means for applying paste to said blanks before they are folded and means located at the discharge end of the machine for pressing the pasted joints.

50 9. In a machine for the purpose set forth, the combination with a forwarding-belt upon the upper lap of which the blanks are delivered and by which they are carried through the machine, of two twisted forming-belts traveling in contact with the upper laps of the forwarding-belt near the side margins thereof, and bars located over the forwarding-belt just inside the forming-belts against which the side margins of the blanks are folded upwardly by the forming-belts.

60 10. In a machine for folding and pasting pasteboard boxes, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-belt throughout the length of said upper lap, said forming-belts extending beyond the forwarding-belt at the discharge

end of the machine, means for applying paste to the blanks, and pressing-rollers located between the forming-belts in advance of the forwarding-belt for pressing the pasted joints of the boxes.

70 11. A machine for folding and pasting pasteboard boxes comprising a forwarding-support upon which the blanks are fed and by which they are carried forwardly, forming-belts located one at each side of the forwarding-support, laterally inside of the planes of the side margins thereof, and which travel in contact therewith and in the same direction as said support, members having parallel vertical surfaces located over said support just inside of said forming-belts between which and the forwarding-support the blanks are fed, and means for twisting said forming-belts intermediate their ends toward said vertical surfaces and downwardly against the forwarding-support.

80 12. A machine for folding and pasting pasteboard boxes comprising a forwarding-support upon which the blanks are fed and by which they are carried forwardly, forming-belts located one at each side of the forwarding-support laterally inside of the planes of the side margins thereof, and which travel in contact therewith and in the same direction as said support, members having parallel vertical surfaces located over said support just inside of said forming-belts, between which and the forwarding-support the blanks are fed, means for twisting said forming-belts intermediate their ends toward said vertical surfaces and downwardly against the forwarding-support, and means for adjusting said forming belts and members toward and from each other to provide for wide and narrow boxes.

105 13. A machine for folding and pasting pasteboard boxes comprising an endless forwarding and supporting belt, and two forming-belts, one at each side of the forwarding-belt which travel in contact with and in the same direction as the forwarding-belt for a portion of their length, said forming-belts lying flat upon the forwarding-belt at the feed end of the machine, feeding-belts at the feed end of the machine which travel on said flat parts of the forming-belts in advance of the forwarding-belt and between which the flat blanks are fed and by which they are carried upon the forwarding-belt, and means for twisting said forming-belts in their parts which travel with said forwarding-belt in a manner to fold the margins of the blank inwardly toward and upon each other in overlapping contact.

120 14. A machine for folding and pasting pasteboard boxes comprising an endless forwarding and supporting belt, and two forming-belts, one at each side of the forwarding-belt which travel in contact with and in the same direction as the forwarding-

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belt for a portion of their length, said forming-belts lying flat upon the forwarding-belt at the feed end of the machine, feeding-belts at the feed end of the machine which travel on said flat parts of the forming-belts in advance of the forwarding-belt and between which the flat blanks are fed and by which they are carried upon the forwarding-belt, means for twisting said forming-belts in their parts which travel with said forwarding-belt in a manner to fold the margins of the blank inwardly toward and upon each other in overlapping contact, means located at the receiving end of the machine for applying paste to one of said folding margins of the blank, and a pressing or squeezing roller located at the discharge end of the machine for pressing the pasted parts of the flaps together.

15. A machine for folding and pasting pasteboard boxes comprising an endless forwarding and supporting belt, and two endless forming-belts which travel above and in contact with and in the same direction as the forwarding-belt and between which the blanks are fed at the feed end of the machine, said forming-belts lying flat upon the forwarding-belt at the feed end of the machine, parallel bars located over the forwarding-belt at the inner margins of the forming-belts at the feed end of the machine, and vertical and horizontal faced rollers engaging the forming-belts in their parts which travel with the forwarding-belt for twisting said forming-belts as they travel toward the front end of the machine, the said forming-belts being twisted half round and lying flat upon the forwarding-belt at the discharge end of the machine.

16. A machine for folding and pasting pasteboard boxes comprising an endless forwarding and supporting belt, and two endless forming-belts which travel in contact with and in the same direction as the forwarding-belt and between which the blanks are fed at the feed end of the machine, said forming-belts lying flat upon the forwarding-belt at the feed end of the machine, parallel bars located over the forwarding-belt at the inner margins of the forming-belts at the feed end of the machine, and vertical and horizontal faced rollers engaging the belt, means for twisting said forming-belts as they travel toward the front end of the machine, the said forming-belts being twisted half round and lying flat upon the forwarding-belt at the discharge end of the machine, one of the horizontally-faced rollers which turns its associated belt from a vertical to an inwardly-inclined position being located in advance of the opposite or corresponding roller.

17. A machine for folding and pasting pasteboard boxes comprising an endless forwarding and supporting belt, and two endless forming-belts which travel in contact with

and in the same direction as the forwarding-belt and between which the blanks are fed at the feed end of the machine, said forming-belts lying flat upon the forwarding-belt at the feed end of the machine, parallel bars located over the forwarding-belt at the inner margins of the forming-belts at the feed end of the machine, and vertically and horizontally faced rollers engaging the forming-belts for twisting said forming-belts as they travel toward the front end of the machine, the said forming-belts being twisted half round and lying flat upon the forwarding-belt at the discharge end of the machine, one of the horizontally-faced rollers which turns its associated belt from a vertical to an inwardly-inclined position being located in advance of the opposite or corresponding roller, means for moving the forming-belts laterally toward and from each other to adjust the machine to different-width boxes, and means for laterally adjusting the belt-twisting rollers to correspond therewith.

18. A machine for folding and pasting pasteboard boxes comprising a traveling support upon which the blanks are fed and by which they are carried forwardly, forming-belts coextensive with the upper lap of the traveling support, one at each side of the forwarding-support, which travel upon and in contact with and in the same direction as said support, means cooperating with said forming-belts at the feed end of the traveling support for delivering blanks to said traveling support, and means for twisting said forming-belts upwardly toward each other and then down upon the support in the parts thereof which travel in contact with the traveling support.

19. A machine for folding and pasting pasteboard boxes comprising an endwise-traveling forwarding-belt the upper lap of which travels horizontally, rollers about which said belt is trained, two narrow belts located at the sides of said forwarding-belt rollers located in front and rear of said forwarding-belt rollers and about which said narrow belts are trained, the upper laps of which side belts travel in contact with the upper lap of the forwarding-belt, means for cooperating with said narrow belts at the feed end of the machine for delivering blanks to said forwarding-belt and means for twisting the parts of said narrow belts which travel in contact with the forwarding-belt.

20. A machine for folding and pasting pasteboard boxes comprising an endwise-traveling forwarding-belt the upper lap of which travels horizontally, rollers about which said belt is trained, two narrow belts located at the sides of said forwarding-belt rollers located in front and rear of said forwarding-belt rollers and about which said narrow belts are trained, the upper laps of which side belts travel in contact with

the upper lap of the forwarding-belt, means for coöperating with said narrow belts at the feed end of the machine for delivering blanks to said forwarding-belt, means for twisting the parts of said narrow belts which travel in contact with the forwarding-belt, and folding-bars located over the receiving part of the forwarding-belt just inside of the twisted parts of the narrow belts and between which and the forwarding-belt the blanks are delivered.

21. In a machine for the purpose set forth, the combination with a forwarding-belt, of two twisted forming-belts traveling in contact with the upper lap of the forwarding-

belt inside the planes of the side margins thereof throughout the length of said upper lap of the belt, means coöperating with said twisting-belts at the receiving end of the machine for starting the folds of the side flaps of the blanks upwardly, and means for adjusting said belts toward and from each other.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 21st day of July, A. D. 1904.

JOHN W. LOW.

Witnesses:

EDWARD V. SHERLOCK,
ROBERT L. LANE.