

April 5, 1938.

C. KEMP

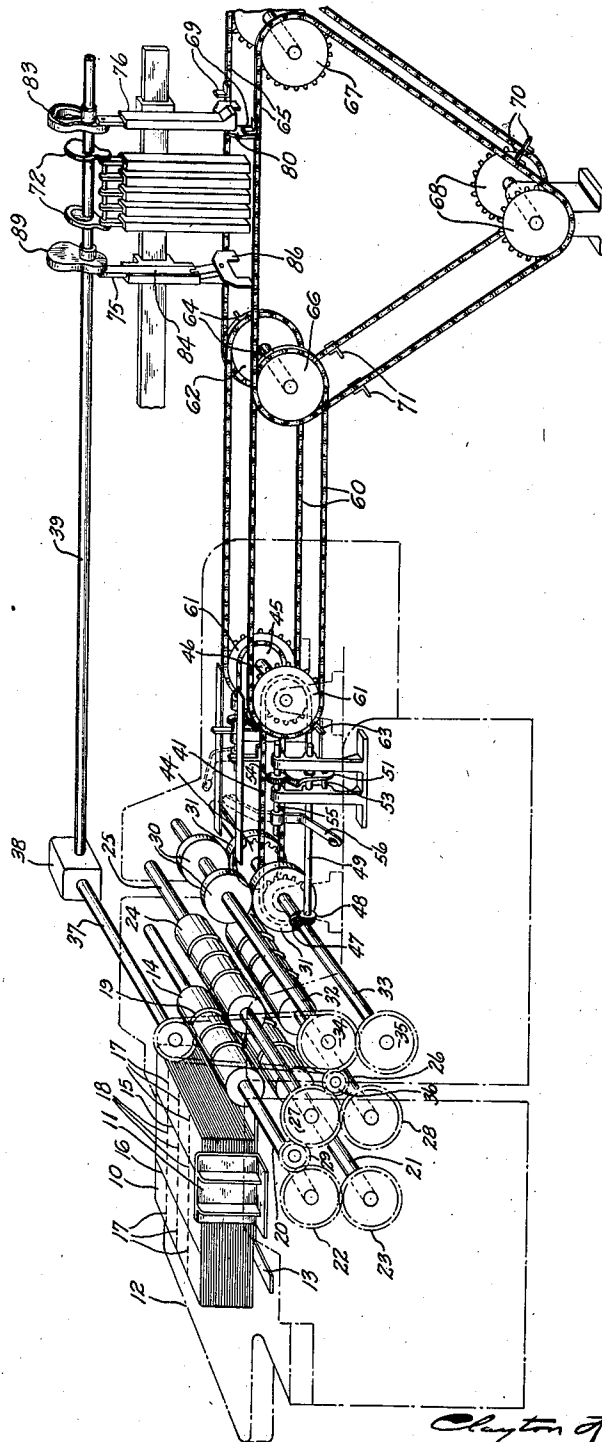
2,113,052

BOX MAKING MACHINE

Filed Nov. 30, 1936

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

Fig. 2.

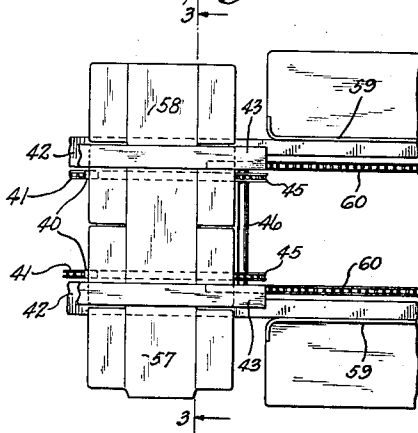


Fig. 3.

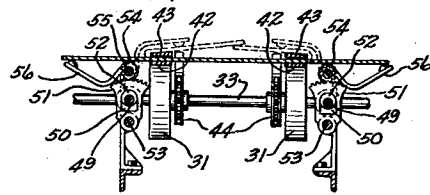


Fig. 4.

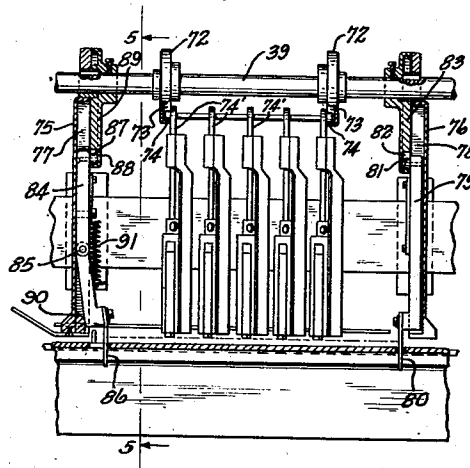


Fig. 5.

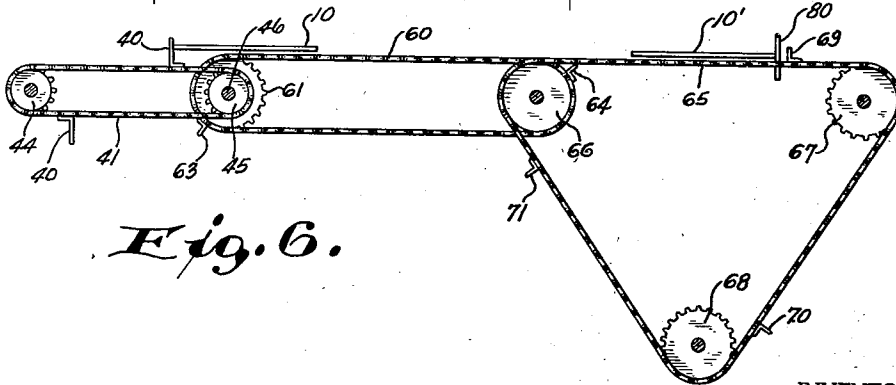
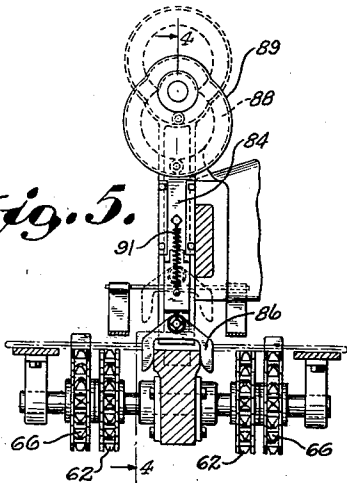


Fig. 6.

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UNITED STATES PATENT OFFICE

2,113,052

BOX MAKING MACHINE

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Application November 30, 1936, Serial No. 113,338

19 Claims. (Cl. 93—42)

This invention relates to improvements in box making machines.

The invention relates more particularly to that class of machine which is capable of effecting continuous and automatic production of knock-down fiber or corrugated board containers, and the invention contemplates the use of mechanism for feeding blanks from a hopper to a folding machine, for conveying the folded blanks from the latter to a stitching machine, and for discharging the completed knock-down boxes from said stitching machine. The invention may be used in connection with apparatus wherein the blanks in the hopper are completely scored and slotted, or the blanks may still require scoring and slotting operations. In this latter case, suitable scoring and slotting mechanism may be interposed between the feed hopper and the folding unit.

The folding mechanism usually employed embodies oscillatory folding arms engageable with opposite side portions of the blank while the latter is in motion to fold said side portions into proper position for the stitching operation. Due to the fact that the blanks are moved while the folding is being performed, there is necessarily a limit to the speed at which the blanks can be conveyed through the folding machine. The stitching mechanism shown herein necessitates momentarily arresting the moving blank, and driving metallic staples through the overlapped, folded portions of the blank before the blank is again freed by the arresting mechanism. The stitching operation may also include the squaring of the folded blank before the staples are driven as set forth in Walker and Werner Patent No. 1,874,671, dated August 30, 1932. The stitching operation on the machine shown herein therefore requires a period of complete arrestation of the folded blank, and it has heretofore not been possible to obtain proper results in both the folding unit and the stitching unit without sacrificing speed of production.

It is therefore an object of the present invention to provide an improved box making machine as above described wherein materially increased production is obtained without causing the blanks to move too rapidly through the folding machine and without limiting the required period of arrestation of the folded blank in the stitching machine.

A more specific object of the invention is to provide a box making machine as above described wherein the speed of the moving blank in the folding machine is less than the speed of

the blank after the folding has been performed, and wherein the time gained by the increased speed after the blank has been folded is utilized in a novel way to afford a suitable amount of time for the period of arrestation in the stitching machine.

With the above and other objects in view, the invention consists of the improved box making machine and all its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawings illustrating one complete embodiment of the preferred form of the invention in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a perspective view of the improved box making machine, certain frame portions being omitted and others being shown by dot-and-dash lines so that the essential mechanism is not hidden;

Fig. 2 is a plan view of a portion of the device showing a blank in position on the folding machine conveyor;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2, the dotted lines showing how the folding of the blank is accomplished;

Fig. 4 is a side elevational view of the stitching mechanism, parts being broken away and shown in vertical section;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4; and

Fig. 6 is a side elevational view of the three conveyors alone, showing how they cooperate with the moving blanks.

Referring first more particularly to Fig. 1, the numeral 10 designates a stack of container blanks positioned between guides 11 on a suitable table 12. A bar 13, which may reciprocate in a well known manner, in timed relationship with the conveyors on the box making machine, is adapted to feed blanks from the bottom of the stack 10 between slotting rollers 14. The blanks have been previously scored along the lines 15 and 16 but must still be slotted at 17 and scored at 18. The rollers 14 may be of standard construction and provided with knives or other instrumentalities 19 for performing the slotting at 17. The rollers 14 are mounted rigidly on shafts 20 and 21, and said shafts have meshing gears 22 and 23 mounted on an end thereof.

After the blanks have passed through the slotting mechanism they are engaged by the rolls 24 which perform scoring along the lines 18, and which rolls may be constructed in any well known

manner to accomplish the desired purpose. The rolls are rigidly mounted on shafts 25 and 26, which shafts have meshing gears 27 and 28 mounted on end portions thereof. A pinion 29 may connect the gear 22 with the gear 27.

It is not essential that the slotting and scoring mechanism be employed, as the blanks in the stack 10 may have been previously completely slotted and scored on separate mechanism.

After an advancing blank leaves the scoring mechanism 24, it passes between pull rollers 30 and 31. The rollers 30 are preferably smaller than the rollers 31, and it is preferred to have the rollers 30 of a diameter approximately 7.962" and to have the lower rollers 31 of a diameter approximately 11.445". By having these rollers approximately the size stated, the rollers 30 being slightly oversize, with respect to standard practice, there is a slight momentary increase in line speed to prevent the blank from stumbling.

The rollers 30 are mounted on a shaft 32 and the rollers 31 are mounted on a shaft 33. Gears 34 and 35 are mounted on adjacent ends of said shafts 32 and 33. The gear 35 meshes with the gear 34, and the gear 34 is connected with the gear 39 through an intermediate pinion 36. Any one of said gears may be driven by a motor (not shown) to drive the train of gears. The shaft 32 is further connected by means of an endless chain or belt with an overhead shaft 37, which shaft extends into a gear box 38 to drive a longitudinally extending overhead shaft 39. The shaft 39 is the drive shaft for the stitching mechanism, as will be hereinafter explained, and as a result the entire machine has inter-related driving mechanism.

As soon as the trailing edge of an advancing blank leaves the nip of the pull rolls 30 and 31, the blank is picked up by one of the sets of flights 40 on conveyor chains 41 (see Figs. 2 and 3) and conveyed over supporting rails or the like 42 and beneath folding irons 43. The conveyor chains 41 are driven by sprockets 44 mounted rigidly on the pull roll shaft 33, and said sprockets are of less diameter than the pull rolls 31, being preferably 10.838" in diameter. The conveyor chains 41 also pass around sprockets 45 mounted on a shaft 46.

The container blanks for which the machine illustrated is particularly adapted are 24" in width, that is they are 24" long in the direction in which they are being fed, and for blanks of this width the flights 40 on the conveyor chains 41 are preferably 34" apart, there being but two sets of flights on the conveyor chains 41 as shown in Fig. 6.

Bevel gears 47 rigidly secured to the shaft 33 drive bevel gears 48 rigidly secured to the ends of shafts 49, and the shafts 49 extend through openings 50 in rack members 51 (see Fig. 3). Within the openings 50 of the rack members the shafts 49 are provided with eccentrics 52, which eccentrics when rotated cause the rack members to oscillate on pivots 53. As the rack members oscillate they impart similar motion to pinions 54 mounted on folding arm shafts 55, and said shafts carry folding arms 56 which move from the full line position of Fig. 3 to the dotted line position therein to fold the portions 57 and 58 of the blank into suitable position for stitching purposes. Therefore as the blank is being moved by the flights 40 of the conveyor chains 41, it is engaged by the oscillatory folding arms 56 and folded to the dotted line position of Fig. 3 while in motion.

The folded blank is then discharged by the conveyor flights 40 to a position between guide rails 59 over an intermediate conveyor comprising spaced chains 60 (see Fig. 2). The conveyor chains 60 travel on sprockets 61 and 62, and said intermediate conveyor has two sets of flights 63 and 64. For the particular machine being described, these sets of flights are spaced apart a distance of 48"; whereas the flights on the folding machine conveyor are spaced apart 34". The sprocket wheels 61 and 62 are larger in size than the sprocket wheels 45 so that the flights 63 or 64 will travel the complete circuit of the intermediate conveyor in the same length of time as it takes the flights 40 on the conveyor chains 41 to travel the complete circuit. Thus the moment one of the sets of conveyor flights 40 on the conveying chains 41 leaves the trailing edge of one of the blanks, said trailing edge is picked up by one of the sets of flights 63 or 64 of the conveyor chain 60. To accomplish this purpose of increasing the lineal speed of the conveyor chains 60 proportionately to the difference in flight spacing between the conveyors 41 and 60, the sprocket wheels 61 must have such a diameter with respect to the sprocket wheels 45 as to cause the conveyor chain 60 to travel at a lineal speed 48/34 greater than the lineal speed of the conveyor chains 41.

A third set of conveyor chains 65 operates in conjunction with the stitching mechanism around sprocket wheels 66, 67 and 68, and the chains 65 are provided with three sets of flights 69, 70 and 71, which sets of flights are spaced 48" apart.

Cam members 72 mounted rigidly on the drive shaft 39 (see Fig. 4) are formed with cam grooves 73 cooperable with rollers 74 to cause reciprocation of a plurality of stitching arms 74'. Said cam members and stitching arms are of standard construction and are therefore not being described in detail. These stitching arms are adapted to be fed with wire from spools (not shown) and are capable of stitching the overlapped portions of the blank together in a well-known manner.

The stitcher drive shaft 39 is journaled through the upper portions of members 75 and 76, which members are formed with slots 77 and 78 respectively. Slidably mounted in the slot 78 is a bar 79 carrying a sheet stopping or arresting plate 80 on its lower end. The upper end of the bar 79 has a pin projecting therefrom, which pin carries a roller 81 cooperable with a groove 82 in a cam member 83, which cam is rigidly mounted on the shaft 39. As a result of this construction, when the shaft 39 is rotated, the bar 79 is reciprocated vertically to move the stop 80 into and out of sheet arresting position, and this movement is synchronized with the movement of the conveyor chains through the interrelated drive.

Slidably in the slot 77 of the member 75 is a bar 84 formed of upper and lower sections which are pivoted together as at 85. The lower section carries a plate 86 similar to the sheet arresting plate 80 on the bar 79, and the upper section is equipped with a projecting roller 87 which rides in a groove 88 of a cam member 89. The slot 77 is formed near its lower end with an inclined cam surface 90 which forces the lower portion of the bar 84 outwardly as shown in Fig. 4 when the bar is in lowered position. The two sections of the bar 84 are connected by a coil spring 91 which normally holds said sections in vertical alinement when the lower end of the bar is above the inclined cam surface 90, the spring being slightly compressed when the lower portion of the bar is

forced outwardly as in Fig. 4. This feature of the stitching machine is shown and claimed in Patent No. 1,874,671 and is adapted to hold the overlapped portions of the blank in squared condition while the stitching is being performed, as fully set forth in said patent.

As before stated, the principal object of the present invention is to obtain increased production without causing the blanks to move too rapidly through the folding machine and without limiting the required period of arrestation of the folded blank in the stitching machine. This is accomplished by a novel cooperation between the lineal speed, flight spacing and flight positioning on the conveyors 41, 60 and 65.

Assuming as before mentioned that the blanks 10 are 24" wide, that is 24" in a longitudinal direction on the conveyors, they are conveyed one at a time by the flights 40 through the folding mechanism, and the folding is performed while the blanks are being moved. The flights 40 are spaced 34" from one another, and there are but two sets of said flights on the conveyor 41. As a set of flights nears the end of the conveyor 41, it moves the folded blank 10 to a position above the intermediate conveyor 60, as shown in Fig. 6. As soon as the flights 40 leave the trailing edge of the sheet the flights 63 on the conveyor 60 are in a position to pick up said trailing edge and continue the movement of the sheet. The lineal speed of the conveyor 60 is such that the flights 64 will be in a position to pick up the next sheet as soon as the other set of flights 40 on the conveyor 41 has finished moving said sheet. Due to the fact that the flights 63 and 64 are spaced 48" apart, whereas the flights 40 are spaced 34" apart, the lineal speed of the conveyor 60 must therefore be 48/34 greater than the lineal speed of the conveyor 41. When the flights 63 on the conveyor 60 near the end of said conveyor, the sheet is thrown into the position shown at 10' in Fig. 6 and against the arresting plate 80 which is timed to lower into arresting position at this particular moment and just after the flights 69 on the conveyor 65 have passed the arresting plate as shown in Fig. 6. Due to the fact that the blank 10' is 24" long and due to the fact that the spacing between the flights 69 and 71 is 48", the flights 71 must move 24" before they engage the trailing edge of the blank 10' which is being stitched. This allows an ample interval of time for the arrestation, squaring and stitching of the folded blank. Just before the flights 71 engage the trailing edge of the blank 10' in the stitcher, the arresting plate 80 and squaring plate 86 are automatically withdrawn and the flights 71 discharge the stitched blank from the machine as a completed knock-down container. By the time the next blank is moved into the stitcher the flights 71 have cleared the arresting plate 80 and are in the position of the flights 69 in Fig. 6, and the flights 70 have moved around to the position of the flights 71.

To further illustrate the principle of the invention and assuming that the machine is producing boxes at a speed of sixty per minute, or one a second, which speed is mentioned only for purposes of illustration, the blanks will be moved through the folding machine at the rate of 34" per second. Due to the increased lineal speed of the intermediate conveyor 60, the blanks will be moved through the intermediate conveyor and into position in the stitcher at a speed of 48"

per second. If therefore the flights 71 are 24" from the trailing edge of the blank 10' in the stitcher, there will be 24/48 or one-half second available for the stitching operation. Thus the folding operation is accomplished at a relatively low speed, which is advantageous as the speed of movement through the folder is limited, and still there is more time available for stitching.

If the flight spacing were equal, that is 34" on all of the conveyors, and the speed of all of the conveyors were equal, then assuming that the blanks are still moving through the folder at the rate of 34" a second, they will also move through the intermediate conveyor at a rate of 34" per second, and if the spacing between the flights 71 and 69 on the stitcher conveyor were 34" and the blanks 24" wide, there would only be 10" between the flight 71 and the trailing edge of the blank 10' in the stitcher. This would therefore allow only 10/34 of a second for the stitching operation as compared to one-half a second with the present invention. Inasmuch as 10/34 of a second is not sufficient time for the stitching, it is therefore necessary with equal flight spacing to slow down all of the conveyors to provide approximately one-half second for the stitching, and as a result the speed of production is curtailed over the speed of the present invention.

From the above it is apparent that the present invention will increase production without causing the sheets to be moved too rapidly through the folding unit and without limiting the time for the period of arrestation in the stitching device. In other words the stopping period in the stitcher is the minimum which is consistent with proper stitching, and the speed of the folding conveyors is somewhat slower than would ordinarily be employed for the same period of arrestation in the stitcher, and the intermediate conveyor operates at such speed and in such a manner as to properly transfer the sheets from the folder to the stitcher.

It is to be understood that the flight spacings, relative speeds of the conveyors, and width of the blank as stated herein are by way of illustration only and are not limitations. It is possible to have a somewhat different speed between the intermediate conveyor and the stitching conveyor, although the same speed is preferred. It is also possible to use means other than flights for moving and maintaining the spacing of the blanks. It is also to be understood that while the present invention has been shown and described as used in connection with a stitching machine, that it may also be employed in connection with other devices for securing the ends of the blanks together, such as machines for taping or the like.

Various other changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in the stitching mechanism, means for moving said second conveyor at a higher lineal speed than said first conveyor, means on said second conveyor pro-

viding greater spacing between blanks than on said first conveyor whereby said greater spacing affords an interval of time for the stitching operation, and means for discharging the blanks from the stitching mechanism.

2. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for temporarily arresting the movement of the folded blank and for stitching the overlapped portions thereof while the movement of the blank is arrested, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in the arresting mechanism, means for moving said second conveyor at a higher lineal speed than said first conveyor, means on said second conveyor providing greater spacing between blanks than on said first conveyor whereby said greater spacing affords an interval of time for the arrestation of the blank during the stitching operation, and means for discharging the blanks from the stitching mechanism.

3. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in the stitching mechanism, means for moving said second conveyor at a higher lineal speed than said first conveyor, means on said second conveyor providing greater spacing between blanks than on said first conveyor whereby said greater spacing affords an interval of time for the stitching operation, and a third conveyor for discharging the stitched blanks operating at the same lineal speed and providing the same spacing between blanks as said second conveyor.

4. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first chain conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second chain conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in the stitching mechanism, means for moving said second chain conveyor at a higher lineal speed than said first conveyor, flights on said second conveyor providing greater spacing between blanks than the flights on said first conveyor whereby said greater spacing affords an interval of time for the stitching operation, and means for discharging the blanks from the stitching mechanism.

5. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first chain conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second chain conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in the stitching mechanism, means for moving said second chain conveyor at a higher lineal speed than said first conveyor, flights on said second conveyor providing greater spacing between blanks than the flights on said first conveyor whereby said greater spacing affords an interval of time for the stitching operation, and a third conveyor for discharging

the stitched blanks operating at the same lineal speed as said second conveyor and having flights thereon spaced the same distance apart as the flights on said second conveyor.

6. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, and a third conveyor having flights thereon for discharging the blanks from said stitching mechanism, the position of the flights on said third conveyor being so related to the position of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism.

7. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, and means for discharging the blank from said stitching mechanism, said means being so timed with relation to the movement of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism.

8. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, a third conveyor for discharging blanks from the stitching mechanism having flights thereon spaced apart the same distance as the flights on said second conveyor, and means for driving said third conveyor at the same lineal speed as said second conveyor, the position of the flights on said third conveyor being so related to the position of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism.

9. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism

for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, a third conveyor having flights thereon for discharging the blanks from said stitching mechanism, the position of the flights on said third conveyor being so related to the position of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism, and means for automatically operating the stitching mechanism during said interval of arrestation.

10. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, means for discharging the blank from said stitching mechanism, said means being so timed with relation to the movement of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism, and means for automatically operating the stitching mechanism during said interval of arrestation.

11. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, a third conveyor for discharging blanks from the stitching mechanism having flights thereon spaced apart the same distance as the flights on said second conveyor, means for driving said third conveyor at the same lineal speed as said second conveyor, the position of the flights on said third conveyor being so related to the position of the flights on said second conveyor that an interval of time is allowed for arrestation of the blank in the stitching mechanism, and means for automatically operating the stitching mechanism during said interval of arrestation.

12. In a box making machine having mechanism for folding portions of the blank into overlapped stitching position and having mechanism for stitching said overlapped portions, a first conveyor for moving the blanks through said

folding mechanism having spaced flights thereon, a second conveyor engageable with the blanks after they have been folded for delivering the same to stitching position in said stitching mechanism, said second conveyor having flights thereon spaced a greater distance apart than the flights on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in flight spacing, means forwardly of said second conveyor and operable in timed relationship therewith for temporarily arresting the movement of the blank below the stitching mechanism, and means for discharging the blank from said stitching mechanism, said means being so timed with relation to the movement of the flights on said second conveyor and with relation to the operation of the arresting means as to operate only after said arresting means has been withdrawn.

13. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for temporarily arresting the movement of the folded blank and for securing the over-lapped portions thereof while the movement of the blank is arrested, means providing for a period of arrestation of the blank in the securing mechanism of predetermined duration, means for conveying blanks through the folding mechanism at a relatively slow speed to prevent injury to the blanks during folding, which speed would normally advance blanks too slowly for the period of arrestation in the securing mechanism, and other means for transferring blanks from the folding mechanism to the securing mechanism operating at a sufficiently higher speed than the folding mechanism conveyor so that the blanks will be fed in properly timed relationship with said period of arrestation in the securing mechanism.

14. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for temporarily arresting the movement of the folded blank and for securing the over-lapped portions thereof while the movement of the blank is arrested, means providing for a period of arrestation of the blank in the securing mechanism of predetermined duration, means for conveying blanks through the folding mechanism at a relatively slow speed to prevent injury to the blanks during folding, which speed would normally advance blanks too slowly for the period of arrestation in the securing mechanism, means for transferring blanks from the folding mechanism to the securing mechanism operating at a higher speed than the folding mechanism conveyor, and means providing for greater spacing of the blanks on said transferring mechanism whereby the blanks are properly fed from the folding mechanism to the securing mechanism and whereby the travel of the blanks is properly synchronized with said predetermined period of arrestation of the securing mechanism notwithstanding said relatively slow speed of the folding mechanism conveyor.

15. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for securing said over-lapped portions, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to operative

position in the securing mechanism, means for moving said second conveyor at higher lineal speed than said first conveyor, means on said second conveyor providing greater spacing between blanks than on said first conveyor whereby said greater spacing affords an interval of time for the securing operation, and means for discharging the blanks from the securing mechanism.

16. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for temporarily arresting the movement of the folded blank and for securing the overlapped portions thereof while the movement of the blank is arrested, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to operative position in the securing mechanism, means for moving said second conveyor at a higher lineal speed than said first conveyor, means on said second conveyor providing greater spacing between blanks than on said first conveyor whereby said greater spacing affords an interval of time for the arrestation of the blank during the securing operation, and means for discharging the blanks from the securing mechanism.

17. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for securing said overlapped portions, a first conveyor for moving the blanks through said folding mechanism, a second conveyor engageable with the blanks after they have been folded for delivering the same to operative position in the securing mechanism, means for moving said second conveyor at higher lineal speed than said first conveyor, means whereby the blanks on said second conveyor are spaced apart a greater distance than the blanks on said first conveyor to afford a greater interval of time for the securing operation, and means for discharging the blanks from the securing mechanism.

18. In a box making machine having mechanism

for folding portions of the blank into overlapped position for being secured together and having mechanism for securing said overlapped portions, a first conveyor for moving the blanks through said folding mechanism in definite spaced relation, a second conveyor engageable with the blanks after they have been folded for delivering the same to operative position in said securing mechanism, means whereby the blanks on said second conveyor are spaced apart a greater distance than the blanks on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in spacing between blanks, and a third conveyor having discharging means for discharging the blanks from said securing mechanism, the position of the discharging means on said third conveyor being so related to the spacing between blanks on said second conveyor that an interval of time is allowed for arrestation of the blank in the securing mechanism.

19. In a box making machine having mechanism for folding portions of the blank into overlapped position for being secured together and having mechanism for securing said overlapped portions, a first conveyor for moving the blanks through said folding mechanism in definite spaced relation, a second conveyor engageable with the blanks after they have been folded for delivering the same to operative position in said securing mechanism, means whereby the blanks on said second conveyor are spaced apart a greater distance than the blanks on said first conveyor, means for driving said second conveyor at a higher lineal speed than said first conveyor proportionately to the difference in spacing between blanks, a third conveyor having discharging means for discharging the blanks from said securing mechanism, the position of the discharging means on said third conveyor being so related to the spacing between blanks on said second conveyor that an interval of time is allowed for arrestation of the blank in the securing mechanism, and means for automatically operating the securing mechanism during said interval of arrestation.

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