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E. L. WALKER ET AL

BOX STITCHING MACHINE

Filed July 27, 1929

1,874,671

2 Sheets-Sheet 1

Fig. 1.

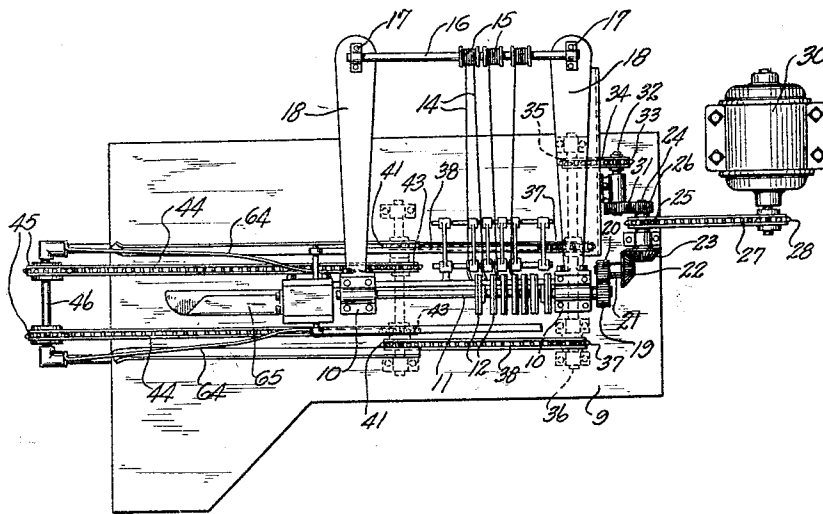
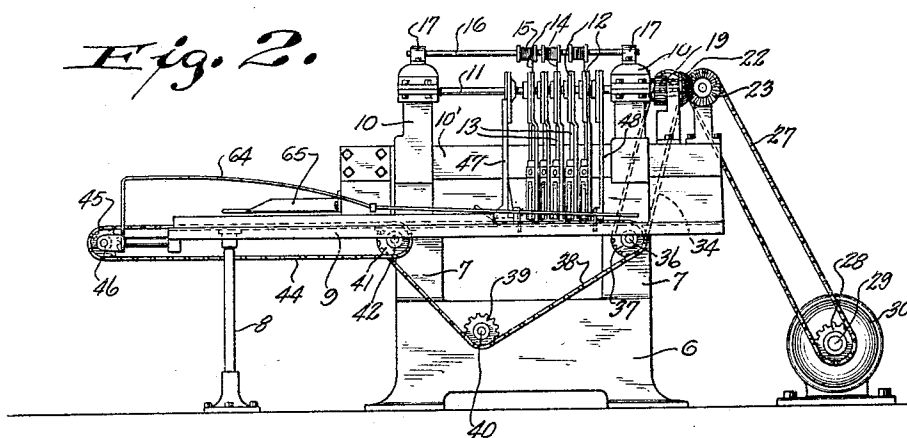


Fig. 2.



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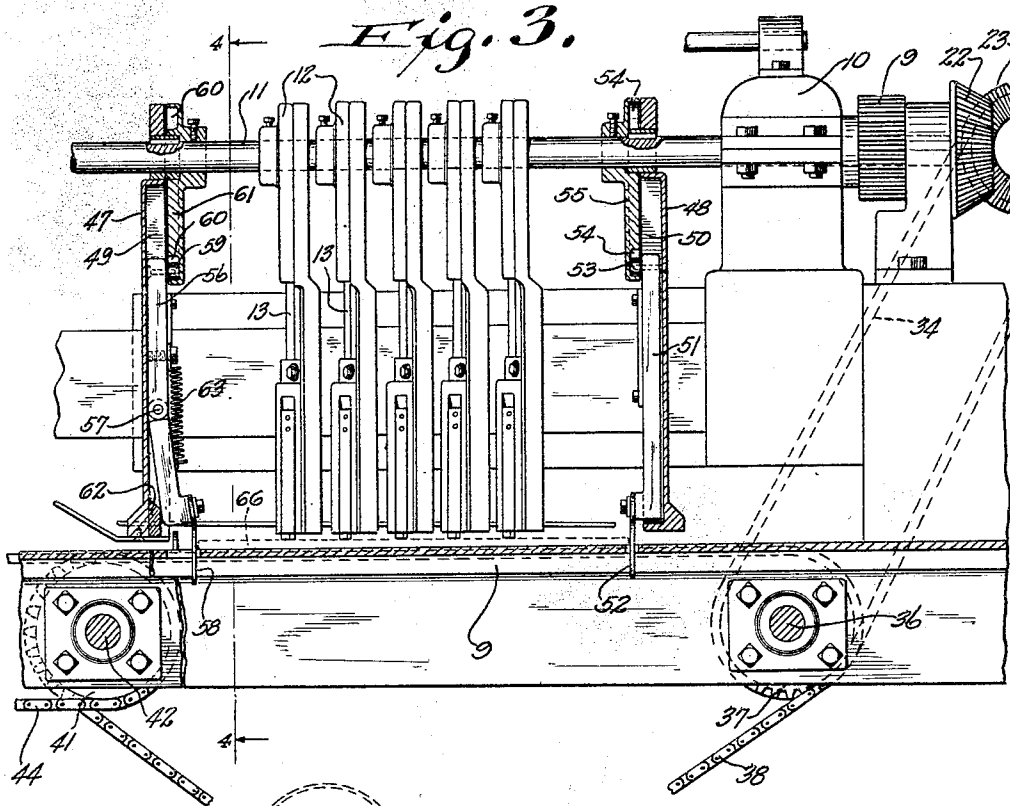
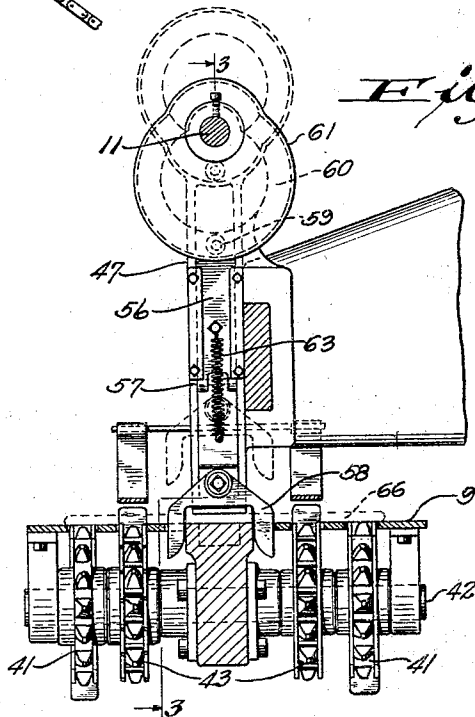
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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BOX STITCHING MACHINE

Application filed July 27, 1929. Serial No. 381,591.

This invention relates to improvements in box stitching machines.

In the manufacture of knockdown paper boxes, after the box blank has been formed and its free ends have been folded over to meet one another, it is necessary to secure said free ends together. This is usually done by a stitching machine which inserts wire staples at suitable intervals. Heretofore, no means has been provided for holding the box blanks in a squared condition in the stitching machine and as a result the containers are frequently imperfect in shape when assembled.

It is, therefore, one of the objects of this invention to obviate the above mentioned imperfections by providing an improved stitching machine having means for holding the box blanks in perfectly squared condition while the staples are being inserted.

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

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

Fig. 1 is a plan view of the improved stitching machine;

Fig. 2 is a side view thereof;

Fig. 3 is an enlarged sectional detail view taken on line 3—3 of Fig. 4; and

Fig. 4 is a sectional detail view taken on line 4—4 of Fig. 3.

Referring to the drawings, the numeral 6 designates a base portion upon which are mounted arms 7 for supporting a table 9. The latter is also supported by a floor stand 8. The arms 7, being spaced apart coincide with the mounting of bearing supports 10 which extend upwardly and carry a shaft 11. A head bar 10' extends longitudinally above the table. A plurality of cam members 12, which are carried by the shaft 11 are arranged to cause reciprocation of a plurality of stitching arms 13. The said cam members and stitching arms are of standard construction and will therefore not be described

in detail. The stitching arms are fed with wire 14 from spools 15, the latter being rotatably mounted on a rod 16. The rod 16 is journaled in bearings 17 on a pair of laterally extending arms 18.

The shaft 11 is provided on its outer end with a rigidly mounted gear 19 which meshes with a gear 20 on a short shaft 21. The said shaft 21 also carries a bevel gear 22 which meshes with a bevel gear 23 on a shaft 24. The shaft 24 carries a sprocket wheel 25 and a gear 26. The sprocket 25 is connected by an endless chain 27 with a sprocket 28 on a drive shaft 29 of an electric motor 30.

The gear 26 on the shaft 24 meshes with a gear 31 on a shaft 32. A sprocket wheel 33, also on the shaft 32, is connected by an endless chain 34 with a sprocket 35 on a shaft 36 below the stitcher table. Other sprocket wheels 37 on the shaft 36 are connected by endless chains 38 with sprocket wheels 39 on a shaft 40, and with sprockets 41 on a shaft 42. Other sprocket wheels 43 on the shaft 42 are connected by endless chains 44 with sprocket wheels 45 on a shaft 46 journaled at the end of the frame.

A novel feature of the stitching machine resides in the means which is employed for holding the folded box blank in squared position while the stitching is being done, so that the completed box will be true in shape. This feature is illustrated in detail in Figs. 3 and 4. Referring to said figures, the shaft 11 is journaled through the upper ends of members 47 and 48 which are formed with slots 49 and 50. Slidably mounted in the slot 50 is a bar 51 carrying a plate 52 on its lower end. The upper end of said bar has a pin 53 extending therefrom which engages a groove 54 in a cam member 55. The said cam is rigidly mounted on the shaft 11.

Slidable in the slot 49 is a bar 56 which is formed of upper and lower sections pivoted together as at 57. The lower section carries a plate 58 similar to the plate 52 on the bar 51, and the upper section carries a pin 59. The said pin is received in a groove 60 of a cam member 61, the latter being also rotatable with the shaft 11. The slot 49 is formed at its lower portion with an inclined surface 62

which forces the lower portion of the bar 56 outwardly. The two sections of the bar 56 are connected by a coil spring 63 which normally holds said sections in vertical alinement with one another, when the lower end of the bar 56 is above the cam portion 62, said spring being slightly compressed when the lower portion of the bar is forced outwardly as in Fig. 3.

When a box blank is placed in the machine it is fed forward by the endless chains 44 and 38 and its folded over ends, which are to be stitched together, are guided into overlapping position by bars 64 and by a guide 65. When the blank enters beneath the stitching arms 13, the cams, bars and plates 52 and 58 are in the raised positions shown by the dotted lines in Fig. 4 permitting the blank to pass below the stitching arms. When the blank is directly below said arms, the cam members 55 and 61 are turned by timed rotations of the shaft 11 to the position shown by full lines in Fig. 4. Through the pins 53 and 59 the bars 51 and 56 are forced downwardly and the plates 52 and 58 grip the blank therebetween. Through the inclined surface 62, the plate 58 is forced inwardly bringing the sides of the folded over ends of the blank into alinement with the corresponding sides of the portion of the blank on which said ends are folded, thereby squaring the box blank, and holding it in squared position until the overlapping edges are stitched together. The plates 52 and 58 are then raised upwardly again and the blank is discharged from the end of the stitcher in completed knockdown form.

Although the invention is more particularly adapted for use in connection with box stitching machines and has been so described, it is to be understood that this invention covers the use of a squaring device in any other combination in which it may be applicable, and it is to be further understood that all changes and modifications are contemplated as may fairly come within the scope of the claims.

What we claim is:

1. In a machine having mechanism for performing a box making operation upon sheet material, a rotatable shaft, a pair of disks having cam grooves therein rigidly mounted on said shaft in spaced apart relation, a pair of guide members, engaging members slidable in said guide members, said engaging members having pins projecting therefrom and engaging said cam grooves so that rotation of the disks will cause reciprocal movement of the engaging members to embrace the sheet material when the latter is in operative relation to said box making mechanism, and means for causing one of said engaging members to be moved toward the other to square said sheet material.

2. In a machine having mechanism for

performing a box making operation upon sheet material, conveying means for said sheet material, and a pair of members engageable with opposite sides of said sheet material when it is in operative position with relation to said box making mechanism for holding said sheet material in squared condition, one of said members being movable toward the other of said members and said other member temporarily arresting the movement of the sheet material.

3. In a machine having mechanism for performing a box making operation upon sheet material, conveying means for said sheet material, a pair of engaging members movable in a direction transverse to the movement of the sheet material toward the latter to embrace the same therebetween, and means for causing one of said engaging members to be moved toward the other to square said sheet material, said other engaging member temporarily arresting the movement of the sheet material while it is being operated upon by the box making mechanism.

4. In a machine having mechanism for securing the folded over ends of a box blank together, conveying means for said box blank, and means engageable with said box blank when it is in operative position with relation to said securing mechanism for temporarily arresting the movement of the blank and for bringing the sides of the folded over ends of the blank into alinement with the corresponding sides of the portion of the blank on which said ends are folded so that said blank will be in squared condition when it is being operated upon.

5. In a machine having mechanism for securing the folded over ends of a sheet of material together, conveying means for said sheet of material, and means engageable with said sheet when it is in operative position with relation to said securing mechanism for temporarily arresting the movement of the sheet and for bringing the sides of the folded over ends of the sheet into alinement with the corresponding sides of the portion of the sheet on which said ends are folded so that said sheet will be in squared condition when it is being operated upon.

6. In a box making machine, conveying means for sheets of material having folded over ends, mechanism for securing said ends together, a driven shaft for operating said mechanism, and movable members engageable with said sheets when they are in operative position with relation to said securing mechanism for holding said sheets in squared condition while the ends are being secured, and a driving connection between said movable members and the shaft for operating the securing mechanism.

7. In a box making machine, conveying means for sheets of material having folded over ends, mechanism including movable

stitcher arms for securing said ends together,
a driven shaft for operating said stitcher
arms, movable members engageable with
said sheets when they are in operative posi-
5 tion with relation to said stitching mechanism
for holding said sheets in squared condition
while the ends are being secured, and a driv-
ing connection between said movable mem-
bers and the shaft for operating the stitcher
10 arms.

In testimony whereof, we affix our signa-
tures.

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