June 30, 1931. H. G. ALLEN 1,812,189

STAPLING MACHINE FOR FIBER BOARD BLANKS

Filed Jan. 24, 1929 3 Sheets-Sheet 1

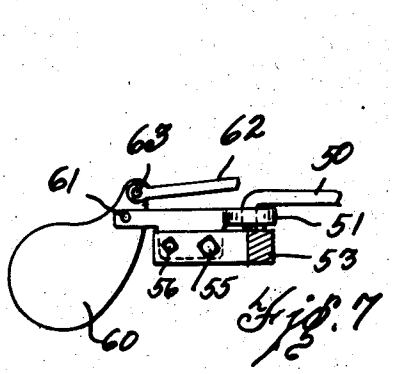


Fig. 7

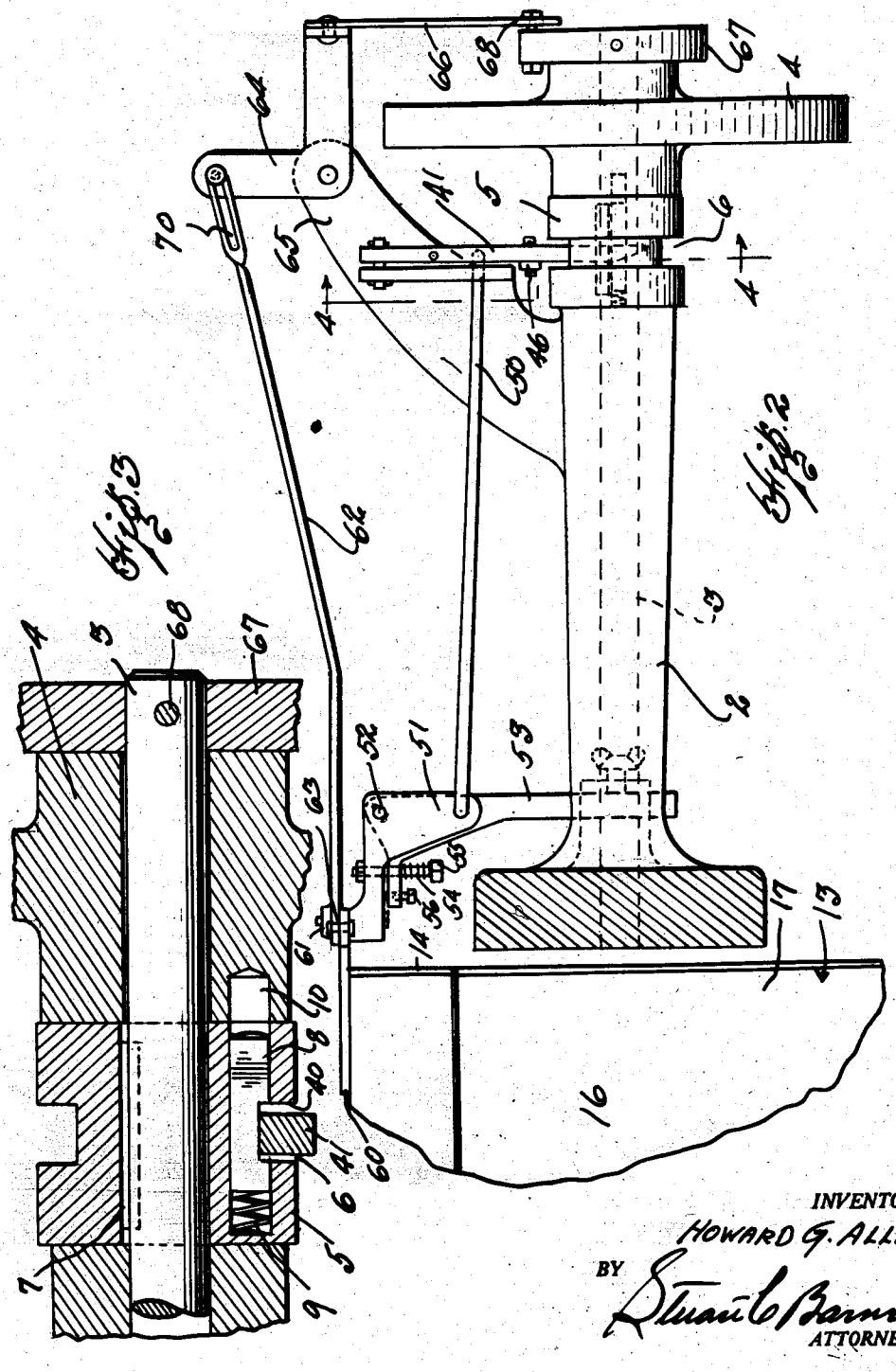
Fig. 1

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STAPLING MACHINE FOR FIBER BOARD BLANKS

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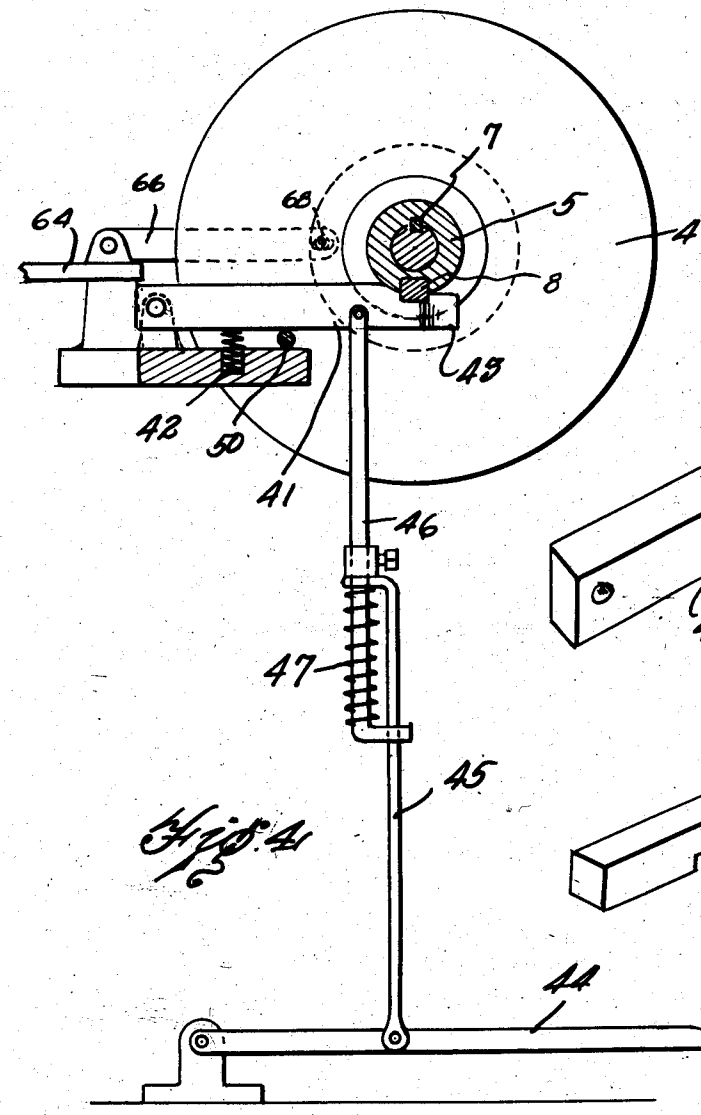


Fig. 4

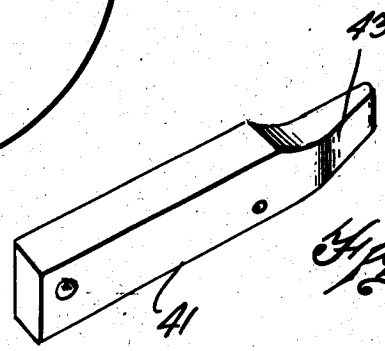


Fig. 5

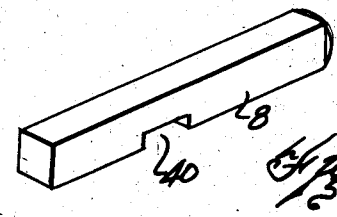


Fig. 6

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UNITED STATES PATENT OFFICE

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STAPLING MACHINE FOR FIBER BOARD BLANKS

Application filed January 24, 1929. Serial No. 334,677.

This invention relates to an apparatus for taking manufacturers' seams in fiber board shipping cases with special reference to seams formed by wire stitches.

In fiber board shipping cases it has been the practice to partially construct the case from suitable blanks or from a single blank by completing one or more of the seams in the blank before the same is shipped to the user. Thus, the user needs to but take the remaining seams. These seams which are put in before the cases are sent to the users are commonly called manufacturers' seams and the seams which are taken are those which permit the blank to be shipped in flat form.

It has been proposed to take these manufacturers' seams by folding the blank or blanks so that all are in substantially a flat form and then stitch the overlapping flaps. Such a proposal will be found in the Crofts Patent No. 1,101,011 of June 23, 1914.

The present invention proposes to take such manufacturers' seams while the blank is at least partially in the shape of the ultimate container as distinguished from being flattened out. There are some very distinct advantages in this method which effects new results. When fiber board blank or blanks are folded up, it is more or less difficult to properly line up the flaps which are to be stitched together, but in accordance with the present method, the blank or blanks are substantially in the normal position which is assumed when in box form so that the overlapping flaps which are to be stitched may be lined up with a nicety. The result is, a more perfect shipping case.

In the accompanying drawings:

Fig. 1 is a side view of a stitching mechanism for taking manufacturers' seams in a shipping case, illustrating a case and its support in cross section.

Fig. 2 is a somewhat diagrammatic view in illustration of some of the mechanism upon the stitching machine which controls the stitching machine operation in accordance with a position of the shipping case.

Fig. 3 is an enlarged sectional detail of an illustration of a clutch mechanism which may be used for a stitching machine.

Fig. 4 is a sectional view taken substantially on line 4—4 of Fig. 2, illustrating the manual control which may be utilized.

Fig. 5 and Fig. 6 are enlarged perspectives of certain of the clutch parts.

Fig. 7 is an enlarged detail of the stop plate and associated parts.

The head of any conventional stitching machine is illustrated at 1, the same being mounted upon an arm 2 in which is a shaft 3 (Fig. 2) driven by means of a suitable source of power (not shown) through a suitable gear 4. This gear 4 is mounted for rotation upon the shaft 3 and a clutch device is interposed between the gear and the shaft. A suitable form of clutch is sleeve 5, having a groove 6, this sleeve being keyed to the shaft as shown at 7 (Fig. 3).

This sleeve carries a bolt 8 which is slidable in the sleeve and which is backed up by a spring 9. The hub of the wheel 4 which may be termed a drive wheel, has a suitable recess 10 within which the bolt is driven by the spring to connect the drive wheel and shaft together in driving relation. Suitable controlling mechanism is provided for controlling the bolt as will later be described.

It will thus be seen that the drive wheel 4 may, when the clutch is engaged, actuate the stitcher head. Referring again to Fig. 1, a suitable support for a container to be stitched is shown at 11 and preferably it has adjustable guide devices 12 which are adjustable for container size. This support is shown more or less diagrammatically in as much as its particular structure is not claimed herein and preferably this support which is to be used, will be vertically adjustable such as the type shown and claimed in my copending application, Serial No. 238,754, filed December 9, 1927.

A container of the type in which a manufacturer's seam is advantageously used, is shown at 13 and when the manufacturer's seam is to be taken, the container is more or less set up in box form as illustrated in Fig. 1. This container shown is of the type which is known as a slotted end. This type is a one-blank container which is folded up to form four of the walls, while the end panels are

provided by suitable end blanks 14 which are adapted to be folded down overlapping each other (Fig. 2).

The manufacturer's seam is taken by stitching flap 16 and flap 17 together. After thus forming, or rather, stitching the two, the case may be collapsed and a lot of them superimposed and shipped in compact form.

In the taking of the manufacturer's seams in the panels 16 and 17, an open head blade anvil is used which may be of the type shown and described in application, Serial No. 329,179, filed November 9, 1928, by H. R. Bliss. It is not necessary to describe this anvil in detail, and it is sufficient to say that there is a suitable support for the anvil as at 18 which supports an anvil part generally in the form of a blade as at 19, and which has a second blade-like guide 20 connected by a vertically-extending wall 21 to the anvil part 19. One flap moves over the blade anvil part while the other flap moves in the space between the flaps 19 and 20 and the two flaps come together over the part of the blade anvil against which the stitches are thrown for clenching the legs thereof. A suitable guide 22 may be provided for guiding the flap 16 into place.

The empty case, in this partially assembled form requires support and for this purpose it is supported from the exterior as by means of suitable rollers 25 rotatively mounted upon journals 26 which in turn are adjustably carried as by means of wing screws 27 upon a supporting rod 28. Obviously these rollers are adjustable in and out for various sizes of cases. Also the container needs support from the interior and for this purpose a bracket 30 may be provided and which may be supported by a part of the blade anvil which lies within the case as shown. A cross rod 31 is carried by this support and mounted upon this cross rod are suitable posts or journal members 32 which rotatively support rollers 33. Preferably the rollers are adjustable as by means of wing screws 34 and the supporting rod 31 may be adjustably held by the bracket as by means of a set screw 35.

These interior and exterior rollers are accurately adjusted for the size of the case and as the case is formed into tube shape as illustrated in Fig. 1, it is moved with endwise movement so that the side walls are gripped between the rollers. These rollers accurately position the parts of the case so that the flaps 16 and 17 are very accurately positioned as with regards to each other. It is to be here noted that the inside and outside rollers are positioned opposite each other so that the material of the case lies directly between them, and also that these rollers are positioned in close proximity to the vertical plane of the stitch-throwing mechanism. Thus the box is supported accurately where the stitch is thrown.

A novel control is provided for the purpose of permitting actuation of the stitch-driving mechanism only at a predetermined time when the container is in proper position and this control functions with the clutch mechanism previously described.

The bolt 8 of the clutch is provided with a groove 40 (Fig. 6) and a pivoted arm 41 is designed to engage in this groove and retract the bolt against the action of a spring 9. A suitable spring 42 normally holds the arm 41 in bolt-retracting position. By reference to Fig. 5, it will be noted that the end of this arm is beveled as at 43 to provide a cam surface against which one wall of the slot 40 engages in the rotating movement of the clutch so that the bolt is retracted by a cam action. This will be appreciated by reference to Fig. 4 wherein the rotational movement is in a clockwise direction.

When the arm 41 is pulled away from its position shown in Fig. 4, or in other words pulled downward, the bolt 8 is released so that it flies into the socket 10 and causes actuation of the stitching head. For the purpose of accomplishing this, there is a suitable foot lever 44 connected to arm 41 through intermediate rods 45 and 46 which preferably have spring 47 interposed between them. Pressure upon the lever 44 tends to compress spring 47 and this spring and spring 42 are so coordinated that the controlling arm 41 is pulled downward.

Engagement of the clutch, however, is permitted only at the predetermined time, which is dependent upon the position of the shipping case. There is a locking bolt or rod 50 which normally underlies the arm 41 to prevent its release of the clutch bolt, and even if the lever 44 be depressed at this time, the spring 47 is collapsed and the clutch is not engaged. This rod 50, as shown in Fig. 2, connects at one end with a bell crank member 51 pivoted as at 52. This bell crank member is pivotally supported upon suitable brackets 53 and it is normally held in position to hold the locking bar 50 underneath arm 41 by a suitable spring 54 surrounding bolt 55. With this construction, it will be noted, by reference to Fig. 2, that clockwise movement of the bell crank member 51 will compress spring 54 which tends to return the bell crank to its normal position. Its normal position is determined by a set screw 56.

On one arm of the bell crank member 51 there is a stop plate member 60 and this stop member is pivoted to the bell crank arm as at 61. This stop member normally lies in the path of the case so that as a shipping case is pushed into position the forwardly projecting end blanks 14 come into contact with this stop plate member as illustrated in Fig. 2. The case at this moment is in proper position for receiving the first wire stitch, but

the stitching mechanism cannot be operated until the locking rod 50 is retracted from underneath the arm 41. As the case is pushed in, it engages the member 60 and rocks the bell crank 51 in clockwise position (Fig. 2) thus retracting rod 51 and permitting operation of the stitching machine.

While this stop plate member has moved back under action of the case urging it, it still lies in the path of the case so as to interfere with this passage thereof through the machine as is necessary to take a row of stitches. In order to move the stop plate out of the way, it is connected to a rod 62, as at 63, and one of the rods is pivotally connected to a bell crank 64 carried by suitable brackets 65. The other arm of this bell crank is joined to a rod 66 which is in turn connected to a disk or wheel 67 secured upon shaft 3 so as to rotate therewith as my means of pin 68.

Accordingly, just as soon as the deflector plate is moved to retract rod 40, the stitching mechanism including shaft 3, begins to rotate. Of course, the case is not moved further until one stitch is taken. Upon rotation of the shaft 3, the bell crank 64 is rocked, thus through the rod 62, rocking the plate 60 upon its pivoted points 61 so that its lower end is pulled upwardly out of the way of the case. The case may now be pushed further along so that it is in proper position to receive the next stitch through the overlapping panels 16 and 17 and the case thus lies under the deflector plate 60. Of course, the element 67 continues to rotate and does not hold the stop plate out of the way with the result that in each revolution as a number of stitches are taken, the stop plate tends to drop down again but is so prevented because it rests upon the top of the case. The bell crank 64 and rod 62 are connected by a pin in a suitable slot 70 to permit actuation of the bell crank by the lost play of this connection, even though the deflector plate rests upon the top of the case and cannot drop into its normal position. After a row of stitches has been completed in one case the stop plate is dropped down into its normal position so that it may again be deflected by the next succeeding shipping case.

The spring 54 is adjustable for tension as by means of tightening the nut on bolt 55. This adjustment can be made for light and heavy cases as considerable tension may be desired for a heavy case; less tension for a small or light case. Moreover, the supporting arm 53 may, and preferably is, made adjustable as to position so that various sizes can be handled.

Claims:

1. The combination with a stitcher head, and an open head blade anvil adapted to underlie overlapping fiber board flaps or the like through which one or more stitches are to be taken, of means carried by the anvil and positioned so as to be disposed within the hollow form of a fiber board blank set up substantially into case shape for supporting the vertically disposed parts of the blank, and a table below the anvil and said means for supporting the blank.

2. The combination with a stitcher head and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into a hollow substantially box form so that parts to be stitched are positioned with respect to the anvil, and means for supporting the vertically disposed walls of the said blank, both from the exterior and the interior thereof.

3. The combination with a stitcher head and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into a hollow substantially box form so that parts to be stitched are positioned with respect to the anvil, and means for supporting the vertically disposed walls of the said blank both from the exterior and the interior thereof, both of said supporting means being disposed in close proximity so as to engage the fiber board between them.

4. The combination with a stitcher head and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into a hollow substantially box form so that parts to be stitched are positioned with respect to the anvil, and means for supporting the vertically disposed walls of the said blank both from the exterior and the interior thereof, both of said supporting means being disposed in close proximity so as to engage the fiber board between them, and said supporting means being positioned in a vertical plane approximating that in which the stitch is taken.

5. The combination with a stitcher head, and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into substantially case form, said table being positioned sufficiently below the stitcher head that the upper wall of the blank immediately underlies the stitcher head for receiving a stitch with parts of the blade anvil disposed within the blank, and a supporting device carried by the blade anvil and disposed within the blank for supporting the vertical walls thereof.

6. The combination with a stitcher head, and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into substantially case form, said table being positioned sufficiently below the stitcher head that the upper wall of the blank immediately underlies the stitcher head for receiving a stitch with parts of the blade anvil disposed within the blank, a support carried by the blade anvil and disposed within the blank, and rollers carried by the sup-

port positioned to engage the vertical walls of the blank.

7. The combination with a stitcher head, and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into substantially case form, said table being positioned sufficiently below the stitcher head that the upper wall of the blank immediately underlies the stitcher head for receiving a stitch with parts of the blade anvil disposed within the blank, a support carried by the blade anvil and disposed within the blank, rollers carried by the support which are positioned to engage the vertical walls of the blank, a support positioned exterior of the blank, and rollers carried thereby which engage and support the vertical walls of said blank outside of and opposite the said first mentioned rollers.

8. The combination with a sticker head, and an open head blade anvil, of a table or the like adapted to support a fiber board blank shaped into substantially case form, said table being positioned sufficiently below the stitcher head that the upper wall of the blank immediately underlies the stitcher head for receiving a stitch with parts of the blade anvil disposed within the blank, a supporting device carried by the blade anvil and disposed within the blank, rollers carried by the supporting device and positioned to engage vertical walls of the blank, and exterior support rollers engaging said vertical walls from the outside and opposite the first mentioned rollers.

9. The combination with a stitcher head, and an open head blade anvil, a table or the like adapted to support a fiber board blank shaped into substantially case form, said table being positioned sufficiently below the stitcher head that the upper wall of the blank immediately underlies the stitcher head for receiving a stitch with parts of the blade anvil disposed within the blank, a supporting device carried by the blade anvil and disposed within the blank, rollers carried by the supporting device and positioned to engage the vertical walls of the blank, an exterior support, rollers carried thereby which engage said vertical walls from the outside and opposite the first mentioned rollers, and means for adjusting said rollers to accommodate for variation in container size.

10. The combination with a stitching machine, of means for driving the same, a clutch disposed between the driving means and stitching mechanism, means for actuating the clutch, a lock device for locking the clutch in disconnected position, a deflector operatively connected to the locking device and positioned in the line of travel of an article to be stitched and which is operative upon deflection by engagement of said article to release the locking device, and means for moving the deflector out of the line of travel of the said article.

11. The combination with a stitching machine, of means for driving the same, a clutch disposed between the driving means and stitching mechanism, means for actuating the clutch, a lock device for locking the clutch in disconnected position, a deflector positioned in the line of travel of an article to be stitched and movably mounted so that upon movement caused by engagement of said article, the locking device is released. means for mounting the deflector for movement in another direction, and means for so moving the deflector in this other direction to position the deflector out of the path of said article.

12. The combination with a stitching machine, of means for driving the same, a clutch disposed between the driving means and stitching mechanism, means for actuating the clutch, a lock device for locking the clutch in disconnected position, a deflector positioned in the line of travel of an article to be stitched and movably mounted so that upon movement caused by engagement of said article, the locking device is released, means for mounting the deflector for movement in another direction, and means for so moving the deflector in this other direction to position the deflector out of the path of said article, said last named means being operatively connected with the stitching mechanism whereby actuation of the stitching machine removes the said deflector from the said line of travel to permit said article to be moved with respect to the stitcher head.

13. The combination with a stitcher head, and an open head blade anvil, of a support for sustaining a fiber board blank or the like which has been shaped into a substantially open ended box blank, and means carried by the blade anvil and positioned within the box blank for supporting the vertical walls thereof.

In testimony whereof I affix my signature.

HOWARD G. ALLEN.