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M. P. JUNKIN

2,388,266

APPARATUS FOR PRODUCING STAYED BOXES

Filed Aug. 21, 1941

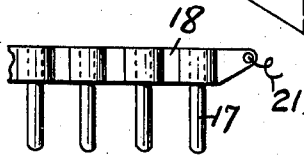
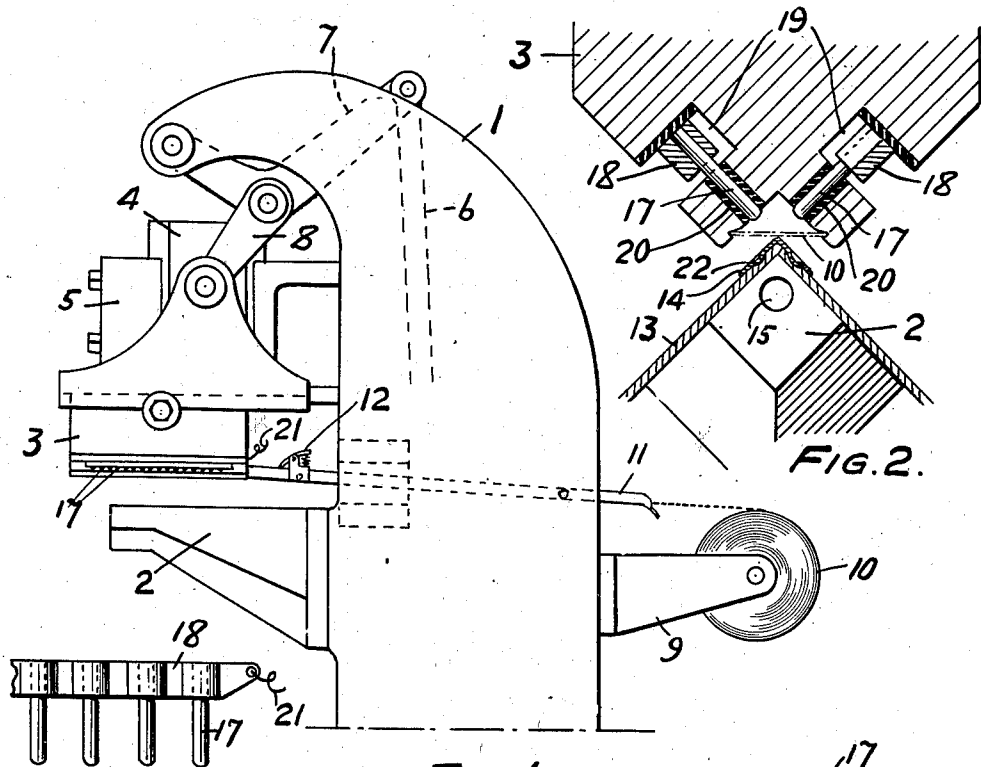


FIG. 3.

FIG. 1.

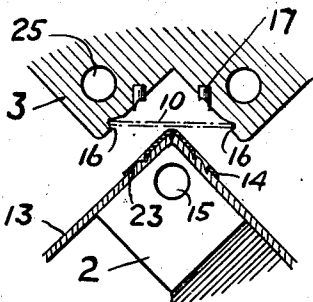


FIG. 4.

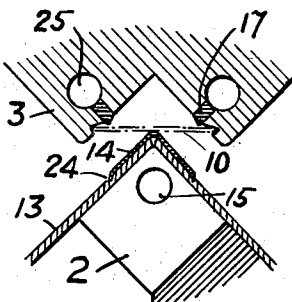


FIG. 5.

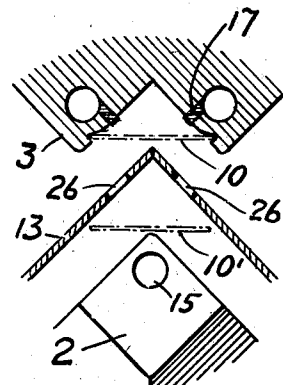
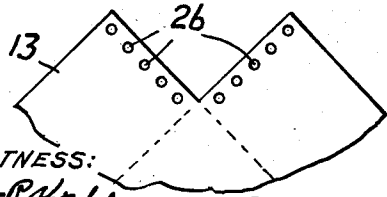


FIG. 6.



WITNESS:
Robert P. Kitchel

FIG. 7.

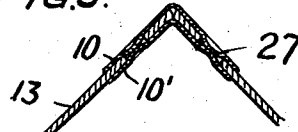


FIG. 8.

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2,388,266

APPARATUS FOR PRODUCING STAYED
BOXES

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Application August 21, 1941, Serial No. 407,764

4 Claims. (Cl. 93—56)

This invention relates to an improvement in method and apparatus for producing stayed boxes and box produced thereby.

More particularly, this invention relates to the production of boxes of the type produced from fibrous material, such, for example, as pasteboard, cardboard, fibre board, and the like, and which heretofore have been provided with corner stays formed from metal.

The stayed box according to this invention is formed from fibrous material and is characterized by the fact that it is provided with corner stays formed from plastic material and adhered at intervals to the fibrous material of the box, or through the body of the box to an inside corner stay of plastic material, by heating and subjecting to pressure.

The method and apparatus according to this invention will be adapted for the application of heat and pressure at points on a plastic stay, positioned relative to the corner of a box formed from fibrous material, to at once force the plastic locally into the body of the box and cause its adherence to the fibres of the body, or to force the plastic through the body of the box and effect its adherence to an inside stay of plastic material.

Having now indicated in a general way the nature of this invention, I will proceed to a detailed description of a preferred embodiment thereof with reference to the accompanying drawing, in which:

Figure 1 is a side view of a machine for applying plastic corner stays to a box.

Figure 2 is a cross sectional view showing details of the machine shown in Figure 1.

Figure 3 is a side view of a detail of construction of the machine shown in Figures 1 and 2.

Figures 4, 5 and 6 are views, partly in section, showing modification in details of the machine shown in Figure 2 for adhering a plastic stay to the corner of a box.

Figure 7 is a plan view of a corner portion of a box blank of fibrous material.

Figure 8 is a sectional view of the corner of a box stayed with a plastic stay.

Referring more particularly to Figure 1, the machine illustrated comprises a frame 1, from which is supported an anvil 2, above which is a die 3, supported from a cross head 4 engaging guides 5. The die 3 is adapted to be lowered and raised with respect to the anvil, as in the usual well known box staying machine, through the medium of the usual connecting rod 6 connected at one of its ends to a driven shaft, not shown, and

connected at its other end to an end of a lever 7, pivoted at its other end to the frame 1 and connected to the cross head through a toggle link 8.

Mounted on a bracket 9 secured to the frame is a roll of strip plastic material 10, which is led through a throat or guide 11 and fed into the die 3 by means of the usual type of feed pawl 12, the plastic strip being provided with spaced perforations for engagement of the pawl. Any well known form of cut-off mechanism will be provided for cutting off the strip in stay lengths.

The plastic strip 10 will be composed of any suitable thermoplastic material. Desirably the strip 10 will have a relatively low melting point to the end that it may be rendered plastic for adherence to a box under relatively low temperature and pressure. The strip 10 will have any desired thickness and width within wide limits and may be of any desired color. While the strip 10 may be formed from various thermoplastics, for example, it may be formed from cellulose acetate, or the like.

Referring now more particularly to Figures 2-5, the anvil 2 will have in general the form usual in well known box staying machine structures for support of the corner portion of a fibre board box 13 to which a stay 14 is to be applied. The anvil will further be provided with chamber 15 extending lengthwise adjacent its working faces for the reception of a heating medium, as, for example, superheated steam, or heating means, as a suitable electric resistance type heater, in order that the working faces of the anvil may be heated to facilitate the adherence of the plastic stay.

The die 3 will be constructed in general in the form usual to box staying machines for cooperation with the anvil 2. The die will be provided with opposite grooves 16, 16 for the reception and support of the strip 10 of plastic material by the pawl 12 and will be formed so as to act to bend or form the strip 10 about the corner portion of the box 13. The die will further be provided with a series of hot points 17 extending from its opposite faces. The hot points 17, as shown in Figure 2, may be formed from any usual form of resistance material used in the formation of electrical heating units, and, secured to conducting bars 18 supported in recesses 19 in the sides of the die, extend through insulating sleeves 20 beyond the working faces of the die. The conducting bars 18 are connected in circuit with a source of electric current, the circuit being indicated at 21. The hot points 17 will be arranged

in spaced relation longitudinally of the opposite faces of the die, as shown by Figures 2 and 3, and will extend beyond the faces sufficiently to press or cut the plastic material of the strip 10 into the body of the fibrous material of the box 13 when the die is brought down on the anvil, while, at the same time, heating the plastic material to render it adherent to the fibre.

As shown in Figure 2, the hot points may be rounded at their ends to indent the plastic into the body of the box, as at 22, or, again, as shown in Figure 4, their ends may be hollowed out to present sharp edges to, in effect, cut the plastic into the box body with formation of spud-like projections 23. If desired, the ends of the hot points 17 may be bevelled, as shown in Figure 5, and the points positioned to force the edge portions of the plastic strip into the box body, as shown at 24, Figure 5.

The dies shown in Figures 4 and 5 are provided with chambers 25 adjacent their working faces for the reception of a heating medium or heating means, to the end that the working faces of the die, as well as the hot points 17, will be heated, thereby facilitating the formation of the strip 10 about the corner of the box.

Referring now to Figures 6-8, the box body 13 is provided adjacent its corners with perforations 26 and an inside stay 10' of plastic material is applied in addition to the outside stay provided by strip 10. The hot points 17 carried by the die act to force the outer stay through the perforations 26 into adherent engagement with the inner stay 10', thus securing the stays to the box body, as shown at 27, Fig. 8.

It will now be appreciated that the apparatus and method in accordance with this invention, while comprising in general, apparatus and procedure heretofore used in the application to boxes of metal stays, is essentially distinguished therefrom in the provision of hot points in connection with the die, and variously in heating the working faces of the die and anvil to effect formation of a thermoplastic stay about the corner of a box and adherence of the stay at points to the fibre of the body of the box, or to an inner stay through the body of the box, by heat and pressure applied through the medium of the hot points.

The product according to this invention, as will be appreciated, comprises, a box of fibrous material provided at its corners with stays of thermoplastic material adhered to the fibre of the box body or to an inner stay through the box body.

It will be appreciated that it is not intended that this invention be limited in detail to the specific description herein of preferred embodiments, since it will be apparent that various modification may be made without departing from the scope of the claims appended hereto.

I have not claimed herein the box structure described and shown, as such forms the subject-matter of a divisional application filed by me Serial No. 434,819, filed March 16, 1942.

What I claim and desire to protect by Letters Patent is:

1. Apparatus for securing a thermoplastic stay about a corner of a box body formed from fibrous material, which comprises, in combination, an anvil having angularly disposed working faces for the support of the corner portion of a box body, a die having angularly disposed working faces adapted to cooperate with the faces of the anvil, hot points projecting from the faces of the die and adapted on operation of the die to apply heat and pressure at points to a thermoplastic strip to effect its adherence to fibre of a box body supported on the anvil.

2. Apparatus for securing a thermoplastic stay about a corner of a box body formed from fibrous material, which comprises, in combination, an anvil having angularly disposed working faces for the support of the corner portion of a box body, a die having angularly disposed working faces adapted to cooperate with the faces of the anvil, hot points presenting relatively sharp edges projecting from the faces of the die and adapted on operation of the die to apply heat and pressure at points to a thermoplastic strip to force material of the thermoplastic strip into the body of the material of a box body and effect its adherence to fibre of a box body supported on the anvil.

3. Apparatus for securing a thermoplastic stay about a corner of a box body formed from fibrous material, which comprises, in combination, an anvil having angularly disposed working faces for the support of the corner portion of a box body, a die having angularly disposed working faces adapted to cooperate with the faces of the anvil, hot points projecting from the faces of the die and adapted on operation of the die to apply heat and pressure at points to a thermoplastic strip to effect its adherence to fibre of a box body supported on the anvil and means for heating the faces of the die.

4. Apparatus for securing a thermoplastic stay about a corner of a box body formed from fibrous material, which comprises, in combination, an anvil having angularly disposed working faces for the support of the corner portion of a box body, a die having angularly disposed working faces adapted to cooperate with the faces of the anvil, hot points projecting from the faces of the die and adapted on operation of the die to apply heat and pressure at points to a thermoplastic strip to effect its adherence to fibre of a box body supported on the anvil and means for heating the cooperating faces of the anvil and die.

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