Feb. 16, 1937. L. L. WISMER 2,070,767

STAYING MACHINE

Filed July 10, 1935 2 Sheets-Sheet 1

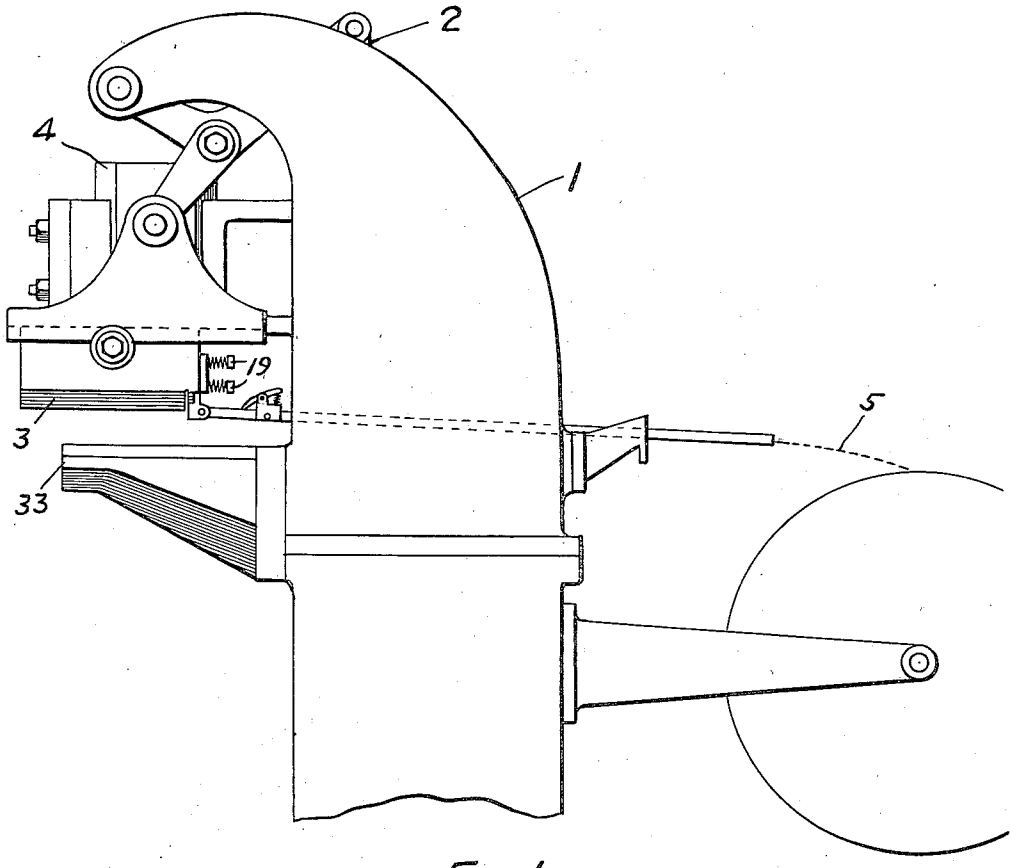


FIG. 1.

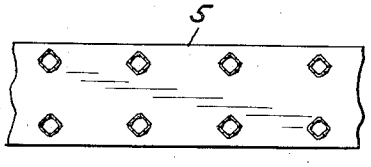


FIG. 2.

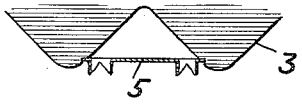


FIG. 3.

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STAYING MACHINE

Filed July 10, 1935 2 Sheets-Sheet 2

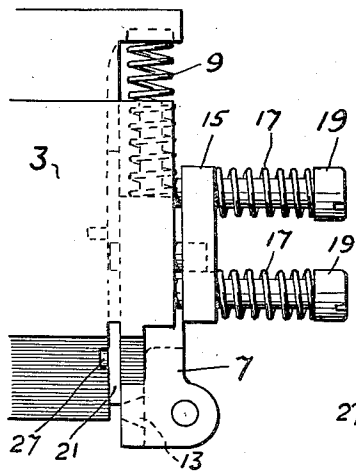


FIG. 4.

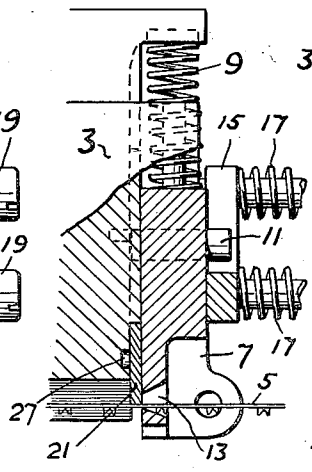


FIG. 6.

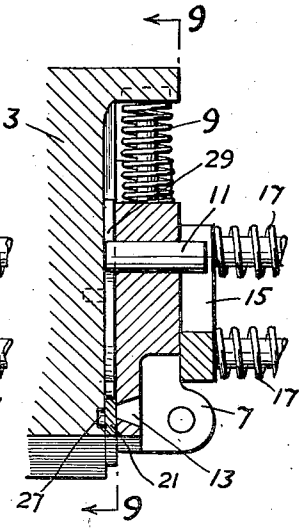


FIG. 8.

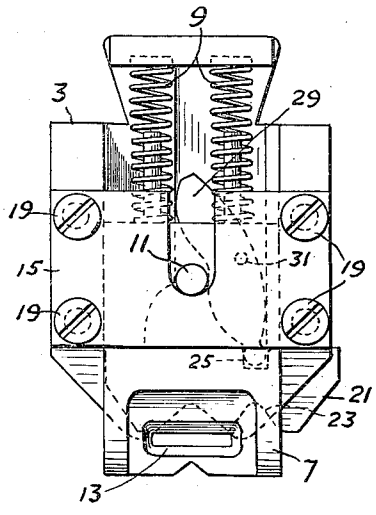


FIG. 5.

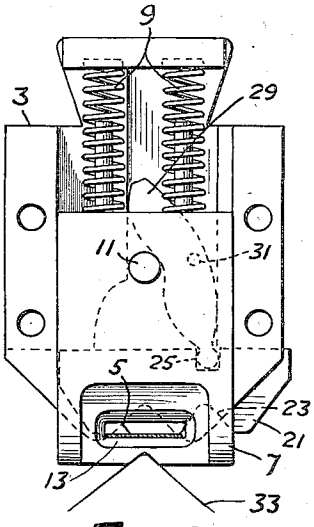


FIG. 7.

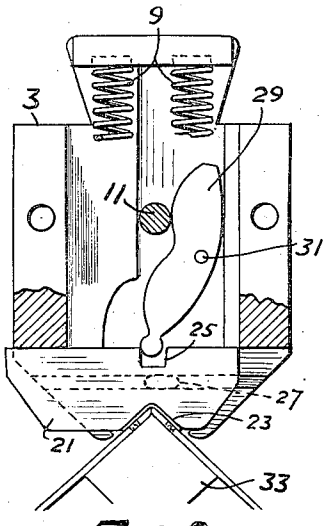


FIG. 9.

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Patented Feb. 16, 1937 2,070,767

UNITED STATES PATENT OFFICE

2,070,767

STAYING MACHINE

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Application July 10, 1935, Serial No. 30,753

2 Claims. (Cl. 1—12)

This invention relates to a staying machine and has particular reference to such machines adapted for the application of metal stay strips to the box edges.

Machines of the general type to which the invention relates are illustrated in, among others, U. S. Patent 793,549, issued June 27, 1905 to Stokes; U. S. Patent 1,192,201, issued July 25, 1916 to Jackson and Horton; and U. S. Patent 1,346,573, issued July 13, 1920 to Walz and Morris. Since the general arrangement of the parts of such machines and their operation is well known and since the present invention relates primarily to details of the mechanism for severing the metal stay strip in the operation of such staying machines, only so much of the complete machine will be described as is necessary for an understanding of the invention.

In box-staying machines of the character referred to, a V-shaped die carried on a vertically reciprocating cross-head acts in cooperation with a V-shaped anvil upon which the box edges are placed to fasten the metal stay strip to the box edges. The die has heretofore been provided with a V-shaped knife fixed thereto and cooperating with a ledger blade formed by the edge of a slot in a cutter slide arranged to reciprocate relatively to the die. Normally this slide is held in a lowered position by the action of springs and as the die descends in the operation of the machine and approaches the anvil the metal stay strip, fed through the slot in the slide, is cut off by the descent of the knife relative to the slide which is held against further movement by engagement with the anvil. Since the knife is necessarily V-shaped in conformity with the shape of the die to which it is fixed, while the lower edge of the slot in the cutter slide is straight, it is apparent that there will be a certain amount of deformation of the metal stay strip when it is cut by the opposing action of the knife and the edge of the slot in the cutter slide. The deformation usually results in a bending of the metal stay strip adjacent its severed edge and this bending is usually sufficient to prevent the severed end of the stay strip from being properly clinched into the body of the box to which it is to be attached.

In accordance with the present invention an improved cutting mechanism is provided for the die by means of which the metal stay strip is severed by the opposing action of a knife with a straight edge cooperating with the straight edge of the slot in the cutter slide and accordingly without deformation of the metal stay strip.

The accomplishment of the objects of this invention will be apparent from the following detailed description read in conjunction with the accompanying drawings of a preferred embodiment of applicant's invention. In the drawings:

Fig. 1 is a fragmentary side elevation of a box-staying machine embodying this invention.

Fig. 2 is a detailed view of a metal stay strip used in this type of box staying machine.

Fig. 3 is a detailed view showing the position of a severed portion of stay strip relative to the die of the box-staying machine.

Fig. 4 is a fragmentary side elevation of the die provided with cutting means in accordance with this invention.

Fig. 5 is an end elevation of the same.

Fig. 6 is a fragmentary elevation, partly broken away, of the structure shown in Fig. 4 showing the parts in a different operating position.

Fig. 7 is an end elevation of the same with the retaining plate for the cutter slide removed.

Fig. 8 is a fragmentary sectional view of the structure shown in Fig. 4 showing the parts in still another operative position; and

Fig. 9 is a vertical section taken on the plane indicated at 9—9 in Fig. 8.

Referring to Fig. 1 which indicates the box-staying machine as a whole, it will be seen that the machine comprises a frame 1 in which is mounted driving means (not shown) having a crank connection with a link 2 which serves to actuate the device for cutting and handling the stay strip. There are indicated specifically only a few of the parts, for example, the die 3, the cross-head 4 and the anvil 33, inasmuch as most of the parts are conventional and well known and are illustrated in the patents referred to above.

Referring to Figs. 4, 5, 6, 7, 8, and 9, there is illustrated the arrangement for severing the metal stay strip in accordance with this invention. The die 3 is provided in conventional manner with a cutter slide 7 which is urged downwardly by the springs 9 to a limiting position determined by a stop pin 11 and which is furnished with a slot 13 through which the metal stay strip 5 passes from the feed and whose lower edge cooperates with the knife in the cutting operation. The slide 7 is held in position in its guide-way in the die 3 by a retaining plate 15, which is slidable outwardly on the studs 19 and is pressed inwardly into position by the strong springs 17 reacting between it and the heads of the studs.

In place of the usual fixed V-shaped knife, however, there is provided in accordance with this invention a knife 21 provided with a V-

shaped notch 23 corresponding in shape to the V-shaped recess of the die 3, in its lower edge and a recess 25 in its upper edge. The knife 21 is arranged to reciprocate horizontally in relation to the die 3 and is guided in this motion by a pin 27 acting in a slot in the die. The vertical movement of the cutter slide 7, during the operation of the staying machine, is transmitted by means of the stop pin 11 to the rocker arm 29 which pivots on the pin 31 to the knife blade 21.

The operation of the cutting mechanism can best be described with reference to a single reciprocatory motion of the die 3. In Figs. 4 and 5 the die is shown with the parts in the positions occupied at the top of the upward stroke. The cutter slide 7 is in its extreme downward position under the influence of the springs 9 and the knife blade 21 is in its extreme rightward position under the action of the rocker arm 29. A strip of metal stay is then fed through the opening 13 in the slide 7 and the die 3 begins its downward motion. The cutter slide 7 soon engages the anvil 33 and is pressed upward into the position shown in Figs. 6 and 7. The metal stay strip 5 is now positioned between the lower edge of the slot 13 in the cutter slide and the edge of the knife blade 21 which is still in its rightward position. The continued descent of the die 3 severs the metal stay strip cleanly between the straight edges of the knife blade 21 and the cutter slot 13 and at the same time through engagement of the rocker arm 29 with the stop pin 11 moves the knife blade 21 to its leftward position as shown in Figs. 8 and 9, in which position the V-slot 23 in the knife blade coincides with the V of the die 3. The continued descent of the die 3 then bends the stay strip 5 and effects the insertion and crimping of the prongs of the stay strip in the box which is placed on the anvil 33. Upon the upward motion of the die 3, the cutter slide 7 is urged downwardly by the springs 9 and the pin 11 engages the opposite arm of the rocker 29 to move the knife blade to the right and back into the position shown in Figs. 4 and 5.

It will be seen that there has been provided in accordance with this invention means for severing the metal stay strip without any distortion thereof, which severing means nevertheless do not interfere with the action of the die in bending the stay strip about the box corner to which it is to be attached. It will be understood that variations from the particular procedure described above may be effected without departing from the scope of this invention.

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

1. In a staying machine a stay cutting and fastening mechanism including a V-shaped die having cooperating cutting elements movable vertically relative to each other attached thereto, one of said elements comprising a horizontally movable knife blade set in a recess in the face of said die with the upper edge thereof abutting over its entire extent and at all times the shoulder of said recess, said knife blade having a straight cutting edge and a V notch conforming to the shape and forming an extension of the die disposed horizontally of each other on its lower portion, and means whereby the relative movement of the cooperating cutting elements will cause first the cutting edge and then the V notch of said knife to be presented for operation, said last named means including a rocker arm pivotally mounted on said die and engaging said knife blade and a stud carried by the other of said cooperating cutting elements and adapted to engage the rocker arm upon relative movement of said cutting elements.

2. In a staying machine a stay cutting and fastening mechanism including a V-shaped die having cooperating cutting elements movable vertically relative to each other attached thereto, one of said elements comprising a horizontally movable knife blade set in a recess in the face of said die with the upper edge thereof abutting over its entire extent and at all times the shoulder of said recess, said knife blade having a straight cutting edge and a V notch conforming to the shape and forming an extension of the die disposed horizontally of each other on its lower portion, guiding means positioned on said die and said knife blade to direct the movement of the latter along a true horizontal path, and means whereby the relative movement of the cooperating cutting elements will cause first the cutting edge and then the V notch of said knife to be presented for operation, said last named means including a rocker arm pivotally mounted on said die and engaging said knife blade and a stud carried by the other of said cooperating cutting elements and adapted to engage the rocker arm upon relative movement of said cutting elements.

LINWOOD L. WISMER.