C. H. CROWELL.

MACHINE FOR PREPARING STAY STRIPS.

APPLICATION FILED FEB. 4, 1913.

1,081,583.

Patented Dec. 16, 1913.

2 SHEETS—SHEET 1.

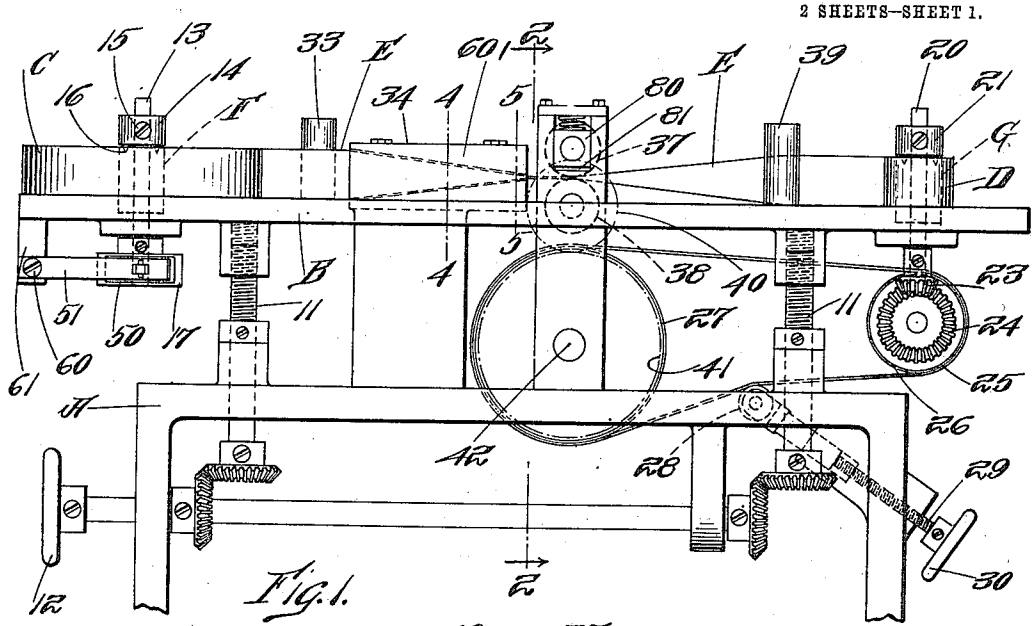


Fig. 1.

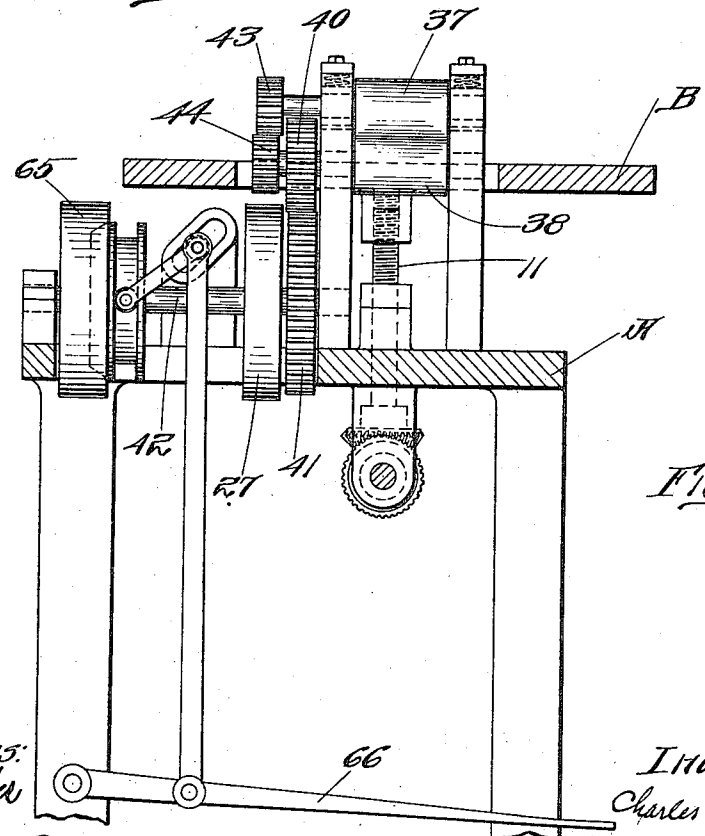


Fig. 2.

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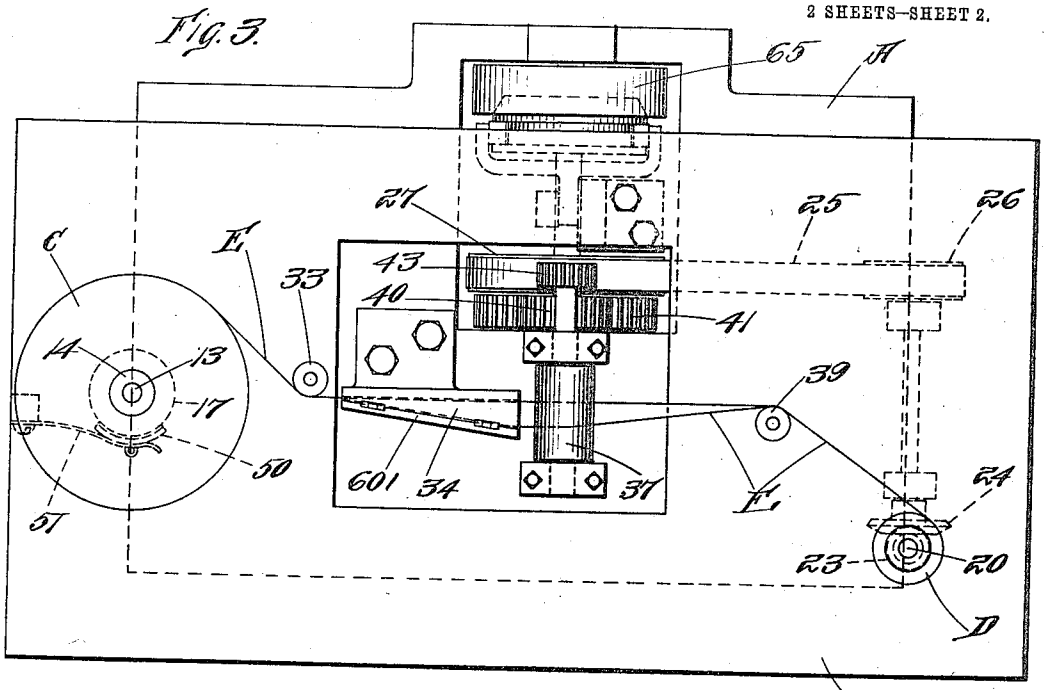
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2 SHEETS—SHEET 2.

Fig. 3.



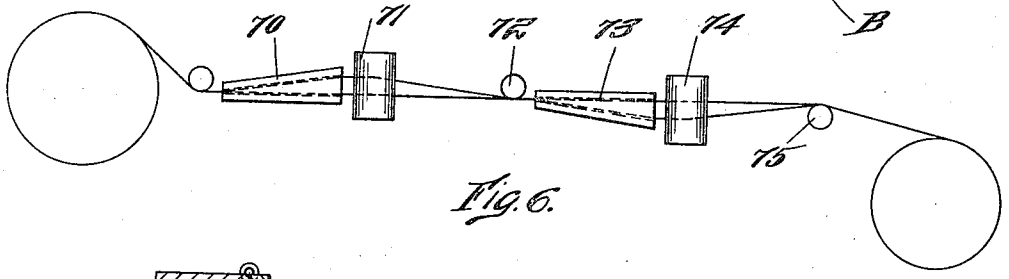


Fig. 6.

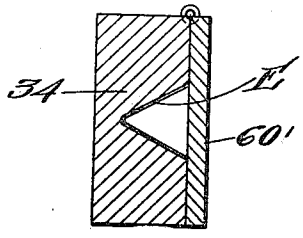


Fig. 4.

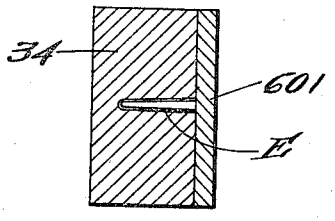


Fig. 5.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR PREPARING STAY-STRIPS.

1,081,583. Specification of Letters Patent. Patented Dec. 16, 1913.

Application filed February 4, 1913. Serial No. 746,163.

To all whom it may concern:

Be it known that I, CHARLES H. CROWELL, a citizen of the United States, residing at Swampscott, county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Machines for Preparing Stay-Strips, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to machines for forming a fold longitudinally of a coil of stay strip for the purpose of removing the resiliency of the strip along the line of fold so that it will not tend to lift or spring off the corner when applied thereto and also for the purpose of causing the stay strip to feed accurately and without veering when it is used in the well known corner staying machine.

The machine forming the subject matter of my invention is particularly intended to produce a stay strip of the novel form shown and described in an application for Letters Patent of the United States filed by me January 27, 1913, Serial No. 744,308. The peculiar feature of the said stay strip is that while it is bent or folded along the median line it is not scored or indented, and is not weakened, at the bending line, but retains its initial strength while at the same time it will feed true in a corner staying machine and all resiliency having been removed along said line of fold, it will lie flat on the sides of the box to which it is applied. The machine embodying the present invention produces this novel stay strip at a minimum of expense so that the stay strip costs no more than marked or indented stay strip.

Accordingly my present invention has for its object a machine which will take a roll of flat stay strip (either gummed or ungummed) unwind the stay strip from the roll, form a fold in it as described, press the strip along the line of fold, flatten it out again and rewind it, performing all the operations simultaneously and as rapidly as it is possible to unwind and rewind the paper. In the machine embodying my invention the stay strip is unwound from a coil, it then passes over or between a suitable folding die or dies which operate to fold the stay strip upon itself along the median line. The stay strip then passes between a pair of pressing rolls which operate to press the stay strip especially at the fold, breaking down any stiffness of the material along said line and removing its resiliency. Thereafter the stay strip passes over a suitable guide roll which opens and flattens the folded strip so that it may be re-wound in its flattened condition ready for use in a corner staying machine.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, the novel features thereof being pointed out and clearly defined in the claims at the close of the specification.

In the drawings, Figure 1 is a side elevation of the machine embodying my invention. Fig. 2 is a section of the same taken on line 2—2 of Fig. 1 looking in the direction of the arrows. Fig. 3 is a top plan view of the machine shown in Fig. 1. Fig. 4 is an enlarged section on line 4—4 Fig. 1, of one of the folding dies. Fig. 5 is an enlarged section on line 5—5 Fig. 1 of the folding dies, this section being taken at a point near the end where the stay strip emerges from the folding dies. Fig. 6 is a plan view showing a modification hereinafter described.

Referring now to the drawings, there is shown at A a suitable frame for the machine. Above this frame and adjustably supported thereon is a table B, upon which the rolls of paper are supported. The table B is adjustable vertically by means of screws 11, 11, operated by the hand wheel 12 to adjust the machine for operation upon different widths of stay strip.

At C is shown the roll of stay strip which is being unwound, and at D the roll which is being rewound, the stay strip between the two rolls being indicated by the letter E. As is well known to those familiar with this art the stay strip is wound on a center of wood, such as is indicated at F and G. The roll C, which is being unwound, is placed on a spindle 13, and a cap 14 secured by a set screw 15 is pressed down on the wooden center F causing the small projections 16 on the under side of the cap 14 to engage the wooden center F. It will thus be seen that the shaft 13 will be caused to rotate when the stay strip E is pulled off the roll C.

In order that the stay strip E may have

the proper tension a friction device or brake is placed on the shaft 13. This consists of a small brake wheel 17 secured to the shaft 13 and having its surface in frictional contact with a brake shoe 50 mounted on a flat spring 51 secured by a screw or similar device as at 60 to a downward projection 61 from the table B. The spring 51 applies sufficient friction to the brake wheel so that the shaft 13 cannot spin and so that a suitable resistance will be offered to the unwinding of the stay strip from the roll.

The stay strip is unwound from the roll C by being wound onto the roll D. The roll D is mounted on a shaft 20 at the other end of the machine and is caused to rotate with said shaft by a cap 21 similar to the corresponding parts of the unwinding shaft 13. The re-winding shaft 20 is driven by a belt and pulley or equivalent device. As shown in the drawings, a belt and pulley 25 and 26 drives the re-winding shaft 20 through the bevel gears 23 and 24. The belt passes over the main driving pulley 27 and is driven by it. The belt 25 is preferably tightened by a tightening pulley 28 adjustable on a screw threaded rod 29, which is conveniently operated by a hand wheel 30.

After leaving the unwinding roll C the stay strip E passes around an idler 33 and then passes through a gradually converging folding die 34, the two sides of which are substantially equal in width to one-half of the width of the stay strip. As the stay strip passes through the converging die it is gradually bent into a V-shape and then as it proceeds is folded upon itself so that its halves are substantially parallel with each other. As will be seen from Fig. 5 the end of the passage in the folding die at which the stay strip emerges is substantially parallel sided and slightly more than twice the thickness of the stay strip to be folded so that the strip may readily pass through it. To keep the stay strip in position in the die 34 I provide a hinged member 601 which contacts with the edge of the stay strip and holds it in the groove in the die.

When the stay strip emerges from the die, folded upon itself along its median line, it passes between a pair of pressing rolls 37 and 38 which iron or compress the strip especially along the line of fold, fracturing and breaking up any sizing, adhesive or other stiff material along said line, and removing all resiliency therefrom. The fibers of the cloth or paper of which the strip is formed are not however torn or broken by the folding or pressing operations so that the strength of the strip is not impaired. After pressing the strip is unfolded and flattened out and rewound in a coil ready for use. By this device a stay strip is produced the two halves of which have a limp hinged connection with the resiliency destroyed at the folding line and when therefore the strip is laid on a box corner it has no tendency to lift off before the adhesive sets as would be the case if the resiliency at the line of fold was not destroyed.

In order to provide for adjustment of the top roll 37 I provide square slidable boxes 80 under which shims 81 may be placed. The boxes 80 are held down on the shims by a spiral spring. After leaving the pressure rolls 37 and 38 the folded stay strip is opened so that it lies flat and is guided over the idler 39 to the re-winding mechanism. As the stay strip is subjected to some tension when it passes over the idler 39, it is substantially flattened out so that it may be rewound without difficulty.

The pressure rolls 37 and 38 are driven at a surface speed equal to the linear speed of the stay strip by means of a pair of gears 40 and 41 on the main shaft 42 and the top roll 37 is driven from the bottom roll 38 by means of two gears 43 and 44, see Fig. 2. As it is desirable that the machine should be capable of folding stay strips of various widths I make provision for its adjustment for this purpose by raising or lowering the table B. When it is desired to fold a wider stay strip the table is lowered a distance equal to one-half the increased width of the stay strip, and a die for a strip of the desired width is inserted. The position of the bite of the pressure rolls 37 and 38 is not changed.

The driving pulley to which power is applied from a convenient source is shown at 65, Fig. 2, mounted on the main driving shaft, and a clutch and shipper device operated by the foot treadle 66, and of well known construction as will be clear from said Fig. 2 is provided for the stopping and starting of the machine.

At Fig. 6 I have shown a modification of my machine in which two folding dies and two sets of pressing rolls are employed. After passing through the die shown at 70 and the pressing rolls 71 it is unfolded and passes the idler roll 72 then through another die 73 which folds it upon itself, but in the reverse direction from the first fold, then between another set of pressing rolls 74, then past an idler 75 where it is flattened out preparatory to being rewound into a coil ready for use. The object of this double folding in reverse directions and double pressing is to provide for stay strip which may be made from very stiff or heavy or intractable material and which may require a double folding to remove all resiliency at the line of fold. A number of foldings and pressings may be employed without injury to any stay strip but usually one folding and pressing will be sufficient to produce a stay strip which will feed evenly in a corner stay machine and which will not have resiliency

enough left in the line of fold to cause it to lift off the box corner when moistened and pressed against the latter.

What I claim is:

1. In a machine of the character described, in combination with a spindle to receive a roll of stay strip, a folding die, pressing rolls, rewinding mechanism, and means for adjusting said folding die and rewinding mechanism with relation to said pressing rolls for various widths of stay strip.

2. In a machine of the character described, the combination with a table having thereon a spindle to receive a roll of stay strip, a folding die and rewinding mechanism of independently supported pressing rolls, and means for adjusting said table with relation to said pressing rolls for different widths of stay strip.

3. In a machine of the character described, the combination with a vertically adjustable table carrying a spindle for a roll of stay strip, guide rolls and a rewinding mechanism for said stay strip, of a die having a passage therethrough with gradually converging sides and pressing rolls adjacent the mouth of said die, said die and said rolls being mounted on the frame of the machine independently of the vertically adjustable table.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES H. CROWELL.

Witnesses:

WILLIAM A. MACLEOD,

ALICE H. MORRISON.