

(No Model.)

3 Sheets—Sheet 1.

H. & H. A. INMAN.
BOX STAYING MACHINE.

No. 555,813.

Patented Mar. 3, 1896.

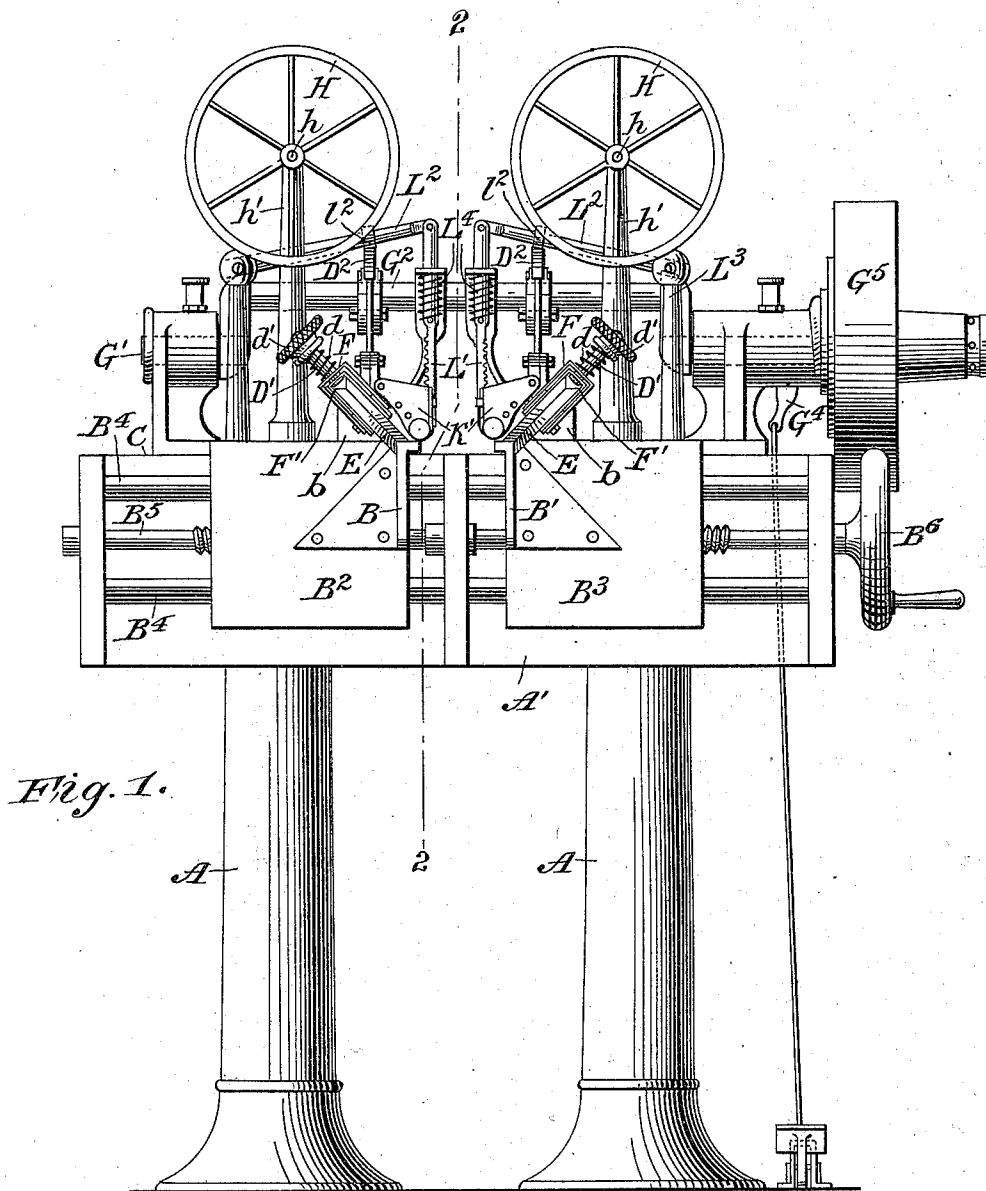


Fig. 1.

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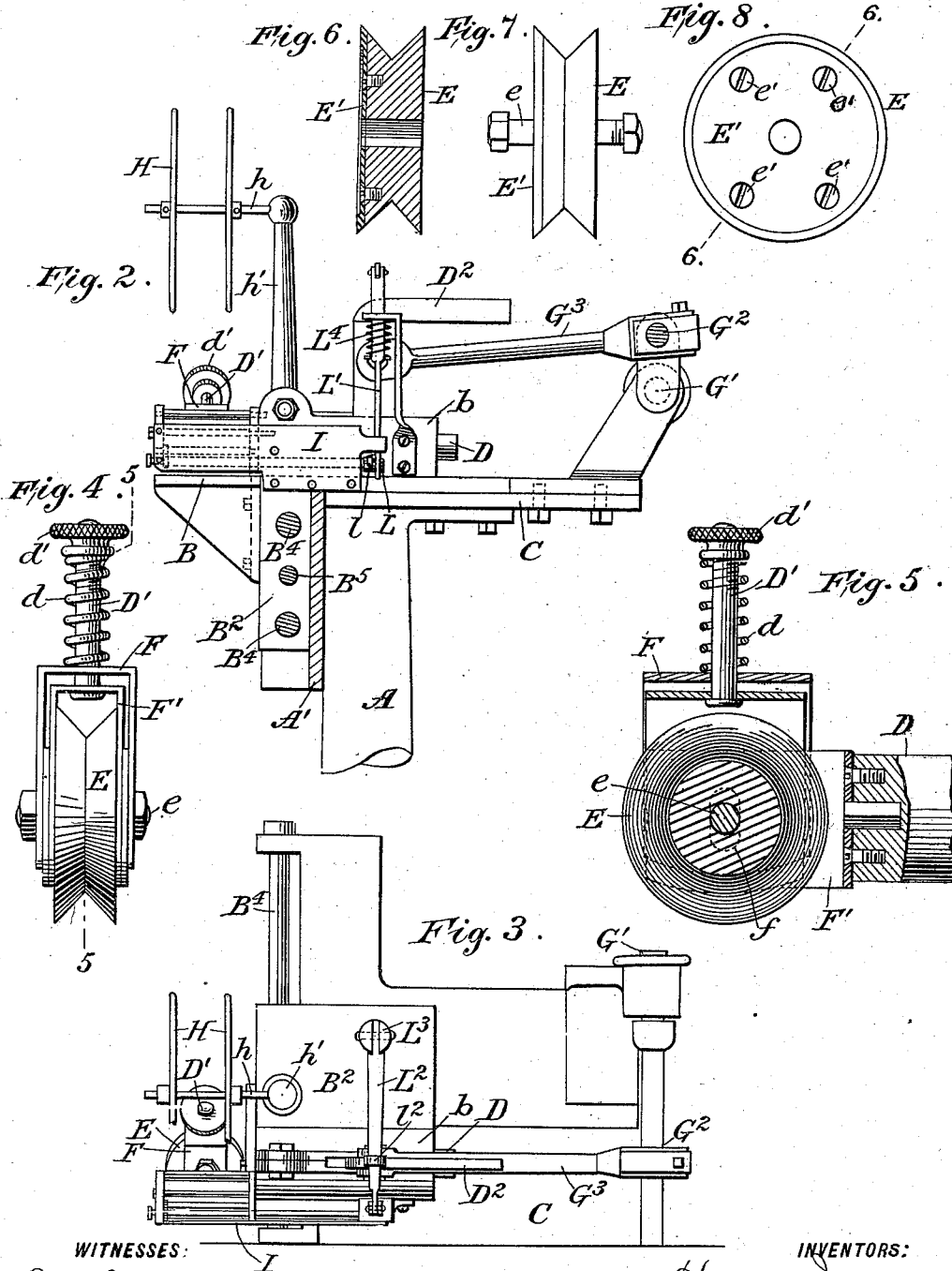
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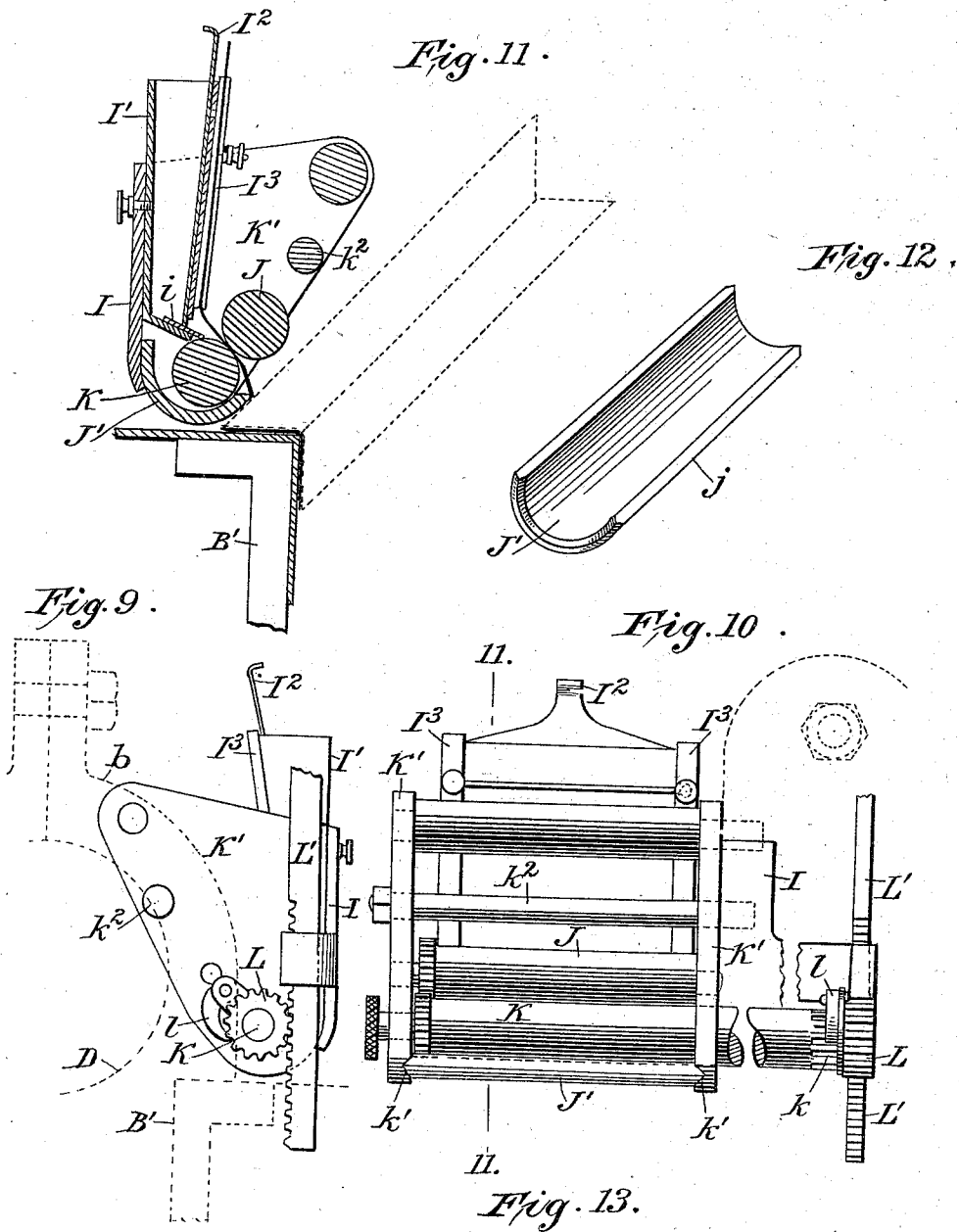
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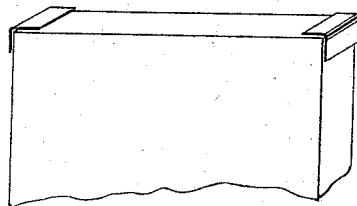
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UNITED STATES PATENT OFFICE.

HORACE INMAN AND HARRY A. INMAN, OF AMSTERDAM, NEW YORK.

BOX-STAYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 555,813, dated March 3, 1896.

Application filed January 13, 1896. Serial No. 575,255. (No model.)

To all whom it may concern:

Be it known that we, HORACE INMAN and HARRY A. INMAN, citizens of the United States, residing at Amsterdam, county of Montgomery, State of New York, have invented certain new and useful Improvements in Box-Staying Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to the construction of machines for applying adhesive strips of paper, cloth, or other similar material to the corners of paste-board or other like boxes for the purpose of strengthening them. In the

15 machine which embodies our present invention we prefer to effect the adhesion of the previously-gummed stay-strip to the box by means of wheels or rollers, which are carried by reciprocating heads or plungers and which

20 will act upon the strips and the box while the latter is held upon a fixed support, substantially as shown and described in another application for Letters Patent of the United States filed concurrently herewith, Serial No.

25 575,253. The machine shown in that application is capable of a variety of uses; but in the present case we have arranged the parts and devised novel features with especial reference to the application of stay-strips to the

30 corners of boxes, and with a view to the application of such stay-strips to two corners of the box at the same time, the preferred form of the machine being capable of adjustment for boxes of different sizes. In order

35 to accomplish the general object which is here alluded to, the present machine differs in many features and details of construction from the machine shown in said application, all of which will be fully described and explained hereinafter with reference to the

40 accompanying drawings, in which is illustrated a convenient and practical embodiment of our present invention.

In the drawings, Figure 1 is a front elevation of a machine to which the present improvements are applied. Fig. 2 is a section on the plane indicated by the line 2 2 of Fig. 1, the supporting-standard being broken off to save space. Fig. 3 is a plan view of the

50 parts shown in Fig. 2, the reel for the con-

tinuous stay-strip being partly broken away that parts below the same may be shown more clearly. Fig. 4 is a front view of one of the wheels or rollers mounted in its carrier. Fig. 5 is a section on the plane indicated by the line 5 5 of Fig. 4, a portion of the carrier being also shown. Figs. 6, 7, and 8 are detailed views in section, in front elevation, and in side elevation, respectively, of one of the wheels or rollers, showing the manner of securing the cutter thereto. Fig. 9 is an end view of the strip-feeding devices, looking from the right in Fig. 10, some of the adjacent parts of the machine being indicated by dotted lines. Fig. 10 is a front view of the parts shown in Fig. 9. Fig. 11 is a section upon the plane indicated by the line 11 11 of Fig. 10, looking toward the right. Fig. 12 is a detailed view in perspective of the adjustable knife or cutter bar of the strip-feeding devices, and Fig. 13 is a view in perspective of a portion of a box or cover with stay-strips applied to the corners thereof.

The working parts of the machine are represented in Fig. 1 as supported upon two pillars or standards A A, upon which are secured a common front plate A' and a common bed-plate C, the several parts of the mechanism being secured to or supported by said front plate and said bed-plate. The box to be operated upon is supported in a fixed position during the application of the stay-strips, and for this purpose the machine might be provided with a single supporting-arm of a proper size to receive the box and to support it with its upper side in a plane substantially parallel with the bed-plate C, substantially as shown in our said application for Letters Patent; but as it is desirable to enable this machine to be adjusted readily and quickly for operation upon boxes of different sizes we prefer to make the support for the box in two parts, as B and B', each of which is carried by independent slides B² and B³, respectively, the latter being mounted upon horizontal rods B⁴, which are carried by the front plate A'. A right-and-left screw-shaft B⁵ is also supported by the front plate A' to engage the slides B² and B³, and is provided with a suitable hand-wheel B⁶, so that the

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necessary adjustment of the parts can be effected. Each slide B² and B³ also carries a complete set of strip feeding, cutting and pressing devices, so that said parts are adjusted with the parts of the box-support as may be necessary, according to the size of the box operated upon. As the strip feeding, cutting and applying devices of the two sets are identical, except for difference in position, a description of one set will suffice for both.

In suitable blocks or bearings *b b*, which are secured to the top of the respective slides B² B³, is mounted a horizontal reciprocating plunger D, which constitutes the carrier for the wheel or roller E. The latter is mounted to rotate upon a spindle *e*, which is carried by a yoke F and is free to move vertically to a limited extent in slots *f f*) represented in dotted lines in Fig. 5) in the cheek-plates of a frame F', which is secured to the end of the plunger D. The frame F' has fixed in its top a screw-threaded stud D', which passes through an aperture in the yoke F and receives above the same a compression-spring *d* and an adjustable nut *d'*, by which means the downward pressure of the yoke F and the wheel E may be regulated as desired. The plunger has connected thereto a link G³, which engages a long crank G² and is free to move upon said long crank with the adjustment of the slides B² or B³, as the case may be. The crank G² is formed on a shaft G', which is supported in suitable bearings on the bed-plate C, and is arranged to be connected to or disconnected from the driving-wheel G⁵ by a suitable starting and stopping device, (indicated as G⁴), which is under the control of the operator.

The reel H, from which the continuous strip of cloth or paper or other material, preferably already gummed, is supplied, is mounted to revolve freely on a spindle *h*, which is fixed to a standard *h'* carried by the slide B² or B³. From the reel H the strip passes to the moistening and feeding devices, which are represented in Figs. 9, 10 and 11. These devices are supported by a plate I, which is secured to the slide B² or B³, and comprise a water-tank I', which is provided with a vertically-adjustable gate I², by means of which the supply of water through the wicking *i* to the moistening and feeding roll K is regulated. The latter is mounted to rotate in suitable bearings in cheek-pieces K', which are secured to the plate I, and has formed at one end thereof ratchet-teeth *k*, which are adapted to be engaged by a pawl *l* carried by a loose pinion L on the end of the shaft or roll K. The said pinion is engaged by a rack-bar L', which moves in suitable guides and is carried by an arm L² pivoted on a suitable standard L³ on the slide B² or B³. The arm L² is provided with a roller *l*² to rest upon a cam D², which is carried with the plunger D. In the forward movement of the plunger D the cam D² lifts the arm L² and with it the rack-bar

L', thereby imparting the requisite forward movement to the pinion L and the shaft or roll K, and as the cam passes from beneath the arm at the end of the rearward movement of the plunger D a spring L⁴ restores the rack-bar and pinion to their former positions, the pawl *l* passing idly over the ratchet-teeth *k* during this movement of the pinion. A press-roll J is also mounted to rotate in the cheek-pieces K' to co-operate with the feed-roll K in feeding the stay-strip forward. A semi-circular knife J' is supported below the moistening and feeding roll K by having its ends entered in correspondingly-shaped grooves *k'*, which are formed in the cheek-pieces K', and the forward edge *j* of said knife J' is adapted to act as a stationary cutter in co-operation with the wheel E, as hereinafter explained. The knife J' may be clamped and securely held in adjusted position by tightening the nut upon the tie-bolt *k*², which connects the two cheek-pieces K'. A suitable guide I³ may be fixed upon the tank I' to direct the stay-strip properly from the reel H to the feed and press rolls J K.

By making the knife J' curved the cutting-edge can be brought in close proximity to the feed-rollers, so that the portion of the strip between the rollers and knife is short and needs no guides or clamping devices to hold it while being cut.

The wheel or roller E is arranged to sever the stay-strip as it advances, and for this purpose it is provided with a cutting-edge to co-operate with the stationary cutting-edge *j* of the knife J'. We prefer to form the cutting-edge for the wheel E on an independent disk E', which is secured to the body of the wheel E by screws *e'*.

It will be understood that both plungers D D are connected by the links G³ to the common crank G², so that the two plungers are reciprocated together, while at the same time adjustment of the plungers laterally toward and from each other is permitted by reason of the freedom of the links G³ to be moved longitudinally upon the crank G².

In the use of our improved machine the two parts B and B' of the support for the box are first adjusted toward or from each other, according to the size of the box, so that the two upper corners of the box shall be firmly supported. Thereafter the parts having been brought to rest previously with the plungers D D in their extreme rearward positions, the engagement of the continuously-rotating wheel G⁵ with the shaft G' is effected, and the plungers D D immediately begin to move forward. In the beginning of their movement the cams D² D² engage the arm L² I², and through the described connection effect the forward movement of the roll K to feed the stay-strips forward over the corners of the box upon the supports B B'. After the movement of the stay-strips ceases the wheels or rollers E E sever the projecting portion of the strips

and lay the severed portions upon the corners of the box and roll over them. In the return movement of the plungers the wheels or rollers again pass over the severed portions of the stay-strips and perfect their union with the box.

It will be evident that the leading features of our present invention may be embodied in many different forms of mechanisms, and we therefore desire it to be understood that we do not intend to limit our invention to the precise construction and arrangement of parts shown and described herein.

What we claim, and desire to secure by Letters Patent, is—

1. In a machine for applying stay-strips to boxes, the combination of a support for the box, two sets of devices reciprocating in planes parallel to the corners of the box for applying stay-strips at the same time to two corners of the box on said support, and common actuating means for said devices, substantially as shown and described.

2. In a machine for applying stay-strips to boxes, the combination of a two-part support for the box to be operated upon, means for adjusting said parts toward and from each other, devices reciprocating in planes parallel to the corners of the box for applying stay-strips to two corners of the box at the same time, and common actuating means for said devices, substantially as shown and described.

3. In a machine for applying stay-strips to boxes, the combination of a two-part support for the box to be operated upon, slides carrying said parts respectively and movable toward and from each other, a right-and-left screw-shaft engaging said slides to shift the same, devices reciprocating in planes parallel to the corners of the box for applying stay-strips to two corners of the box at the same time and common actuating means for said devices, substantially as shown and described.

4. In a machine for applying stay-strips to boxes, the combination of two slides movable toward and from each other, means to shift said slides, two sets of devices reciprocating in planes parallel to the corners of the box for applying stay-strips mounted respectively on said slides to operate together upon the two corners of a box, and common actuating means for said devices, substantially as shown and described.

5. In a machine for applying stay-strips to boxes the combination of a support for the box to be operated upon, two slides movable toward and from each other, a plunger reciprocating in a plane parallel to the corners of the box mounted upon each of said slides, a wheel or roller carried by each of said plungers and adapted to apply a stay-strip to the box, a long crank, and links connecting each of said plungers to said crank and movable longitudinally on said crank, substantially as shown and described.

6. In a machine for applying stay-strips to

boxes, the combination of a support for the box to be operated upon, two slides movable toward and from each other, a roller reciprocating in a plane parallel to the corners of said box carried by each of said slides and adapted to apply a stay-strip upon the box and strip-feeding devices carried with each of said slides, substantially as shown and described.

7. In a machine for applying stay-strips to boxes, the combination of a two-part support for the box to be operated upon, slides movable toward and from each other and carrying the parts of said support respectively, a reciprocating roller carried by each of said slides to apply a stay-strip to the box, strip moistening and feeding devices carried by each of said slides, a strip-cutting device carried by each of said slides, means to shift said slide and means to actuate the strip feeding, cutting and applying devices of the two slides together, substantially as shown and described.

8. In a machine for applying stay-strips to boxes the combination of a support for the box to be operated upon, a slide carrying said support, means to shift said slide, a reciprocating plunger mounted on said slide, a roller carried by said plunger, a long crank mounted in fixed bearings and a link connecting said crank to said plunger and movable longitudinally on said crank, substantially as shown and described.

9. In a machine for applying stay-strips to boxes, the combination of a support for the box to be operated upon, a reciprocating plunger, a roller carried by said plunger to apply the stay-strip to the box, a feed-roll to feed said stay-strip forward, a pinion having a pawl to engage and actuate said roll, a rack-bar engaging said pinion, a cam carried by said plunger and intermediate devices whereby the reciprocations of the cam with the plunger are caused to effect movement of the rack-bar, substantially as shown and described.

10. In a machine for applying stay-strips to boxes, the combination of a support for the box, a reciprocating plunger, a wheel or roller carried by said plunger to apply the stay-strip to the box and having a cutting-edge on one side, feeding and moistening devices for said stay-strip and a semicircular knife supported below said feeding and moistening devices, and having one edge formed as a cutting-bar to co-operate with the cutting-edge of said wheel or roller, substantially as shown and described.

11. In a machine for applying stay-strips to boxes the combination of a support for the box, a reciprocating plunger, a wheel or roller carried by said plunger to apply the stay-strip to the box and having a cutting-edge on one side, a feeding and moistening roll for said stay-strip, cheek-pieces supporting said feeding and moistening roll and having semi-

2
circular grooves in the opposing faces of each
below said roll, a semicircular trough having
its ends engaged in said grooves and having
one edge formed as a cutting-bar to co-operate
5 with the cutting-edge of said wheel or roller
and a tie-rod connecting said cheek-pieces to
clamp said trough between them, substan-
tially as shown and described.

This specification signed and witnessed this
9th day of January, A. D. 1896.

HORACE INMAN.
HARRY A. INMAN.

In presence of—

ROBT. N. CLARK,
H. B. WALDRON.