

(No Model.)

2 Sheets—Sheet 1.

H. & H. A. INMAN.

MACHINE FOR APPLYING ADHESIVE STRIPS TO BOXES, &c.

No. 555,811.

Patented Mar. 3, 1896.

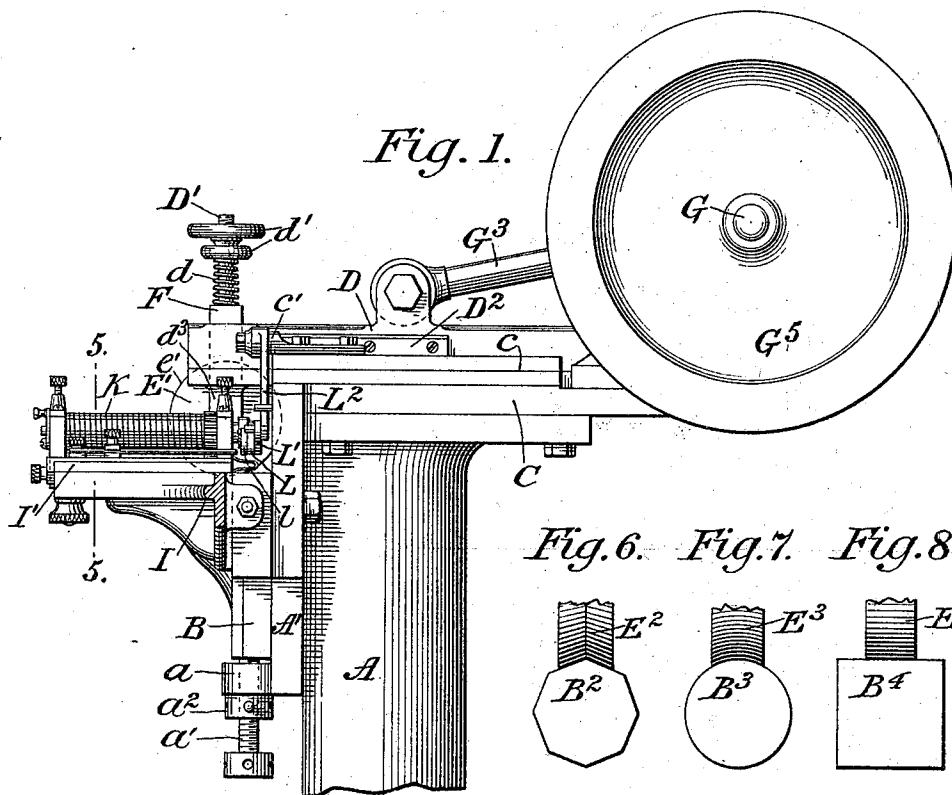


Fig. 6. Fig. 7. Fig. 8.

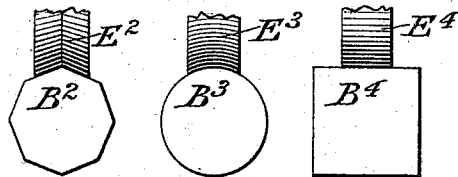
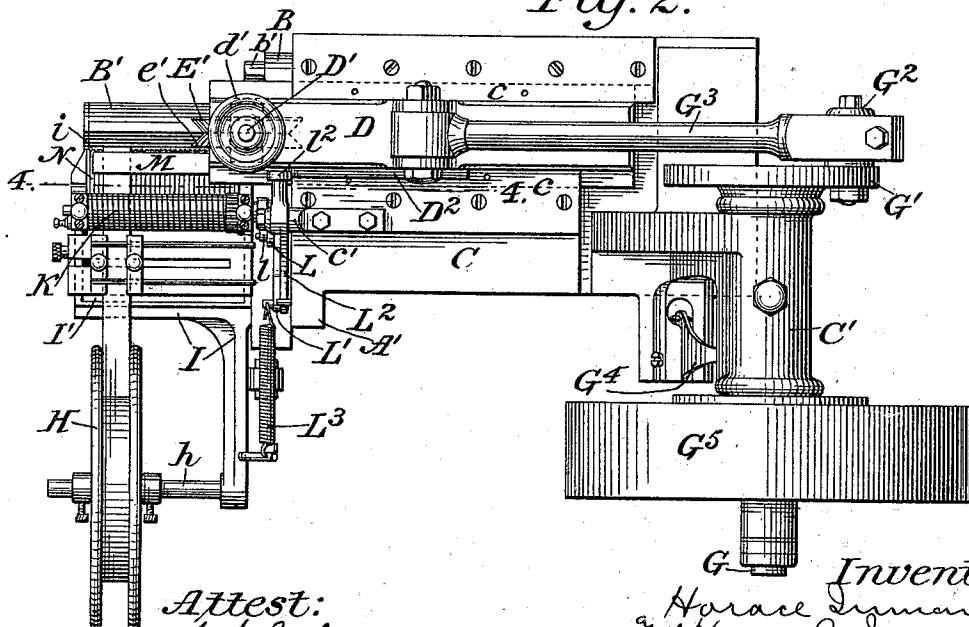


Fig. 2.



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Fig. 3.

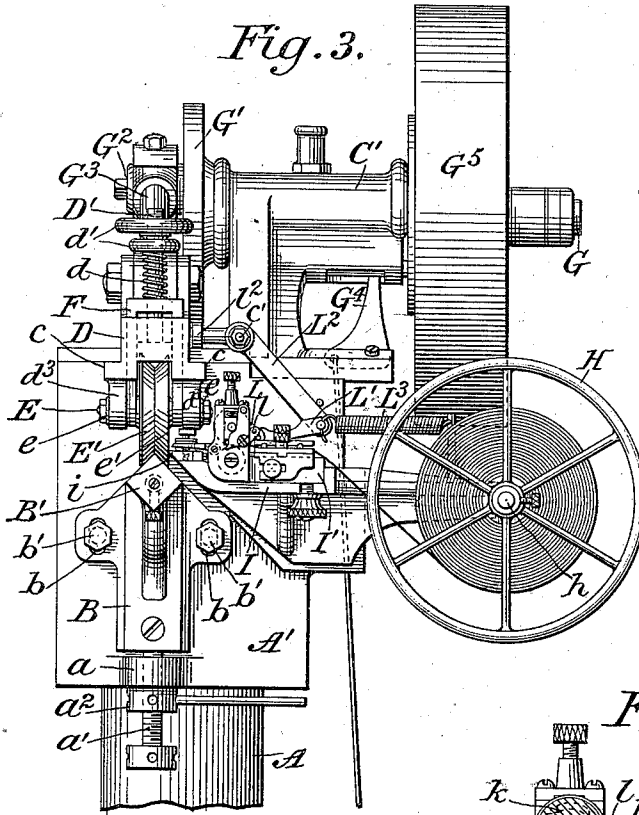


Fig. 5.

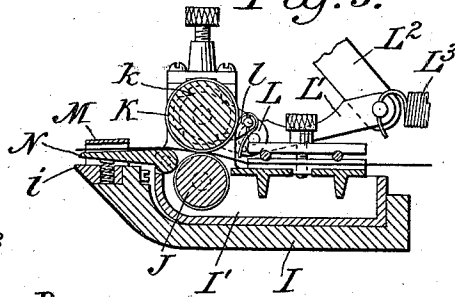
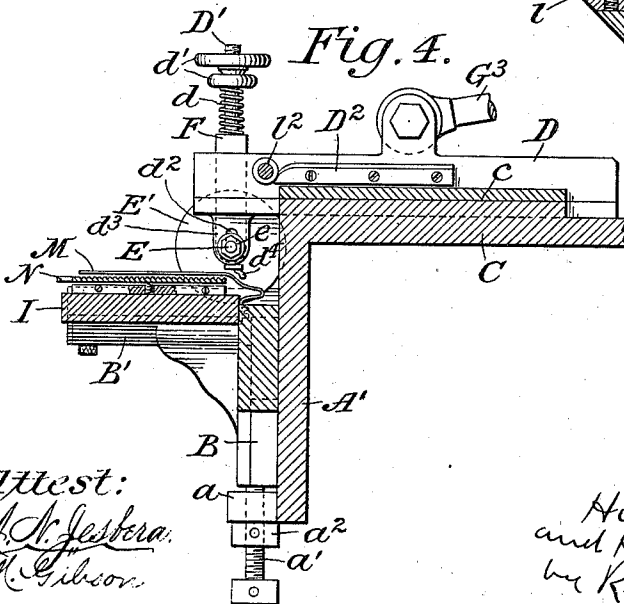


Fig. 4.



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UNITED STATES PATENT OFFICE.

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

MACHINE FOR APPLYING ADHESIVE STRIPS TO BOXES, &c.

SPECIFICATION forming part of Letters Patent No. 555,811, dated March 3, 1896.

Application filed January 13, 1896. Serial No. 575,253. (No model.) Patented in Canada February 4, 1896, No. 51,214.

To all whom it may concern:

Be it known that we, HORACE INMAN and HARRY A. INMAN, citizens of the United States, residing in Amsterdam, county of Montgomery, State of New York, have invented certain new and useful Improvements in Machines for Applying Adhesive Strips to Boxes and other Articles, (for which we have received Letters Patent in Canada, No. 51,214, dated February 4, 1896,) of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to the construction of machines of a general class which are employed for applying labels and addresses to articles of various descriptions, for applying strengthening or fastening strips to the joints formed by the meeting edges of the parts composing a paper box or other article, for applying a stay-strip to the corner of a pasteboard or strawboard box, and for a variety of other similar purposes in which the material to be applied is a gummed or adhesive strip or piece of paper, cloth or other like material.

Machines of this class heretofore constructed have generally been of one or the other of two different kinds. In the one kind of machine the adhesion of the previously gummed and moistened strip or piece to the box or other article is effected by the impact or direct pressure of one of two clamping-dies which reciprocates vertically with relation to the other of said clamping-dies, the latter constituting a form or anvil for the box or other article during the action of the movable die. In the other kind of machine, which is adapted only for the manufacture of boxes or other like articles, the box to which the strengthening or stay strip is to be applied is mounted upon a rotating form or holder and receives the strengthening or stay strip from a spool or reel, suitable guides and pressers being provided to properly apply the gummed strip to the box as it rotates.

In machines of the kind first referred to the gummed strip receives the pressure of the clamping-dies but once, and for this reason and also because the movement of the movable die is only in a direction at right angles to the face of the fixed die the machine must be so strongly and heavily constructed as to

be capable of exerting great pressure upon the box or other article and the strip applied thereto while they are interposed between the two clamping-dies. Moreover, such machines are necessarily subjected to severe strains in use and are therefore subject to rapid deterioration unless they are specially constructed to withstand such strains.

Machines of the other kind referred to are necessarily somewhat slow in operation and are not readily adjusted for different classes of work.

It has been discovered that the gummed strip can be made to adhere with the necessary firmness to the box or other article if it is laid on by and subjected to the action of a wheel or roller and that the adhesion of the strip to the box or other article is made absolutely certain if the roller or wheel passes over the strip twice in opposite directions.

Our invention relates to this latter class of machines, and we have devised a mechanism which, whether it is intended for the application of labels to boxes or other articles, or for the application of stay-strips to corners of boxes, or for any other like purpose, embodies in its construction a support for the article to which the adhesive strip is to be applied, a presser-plunger reciprocating in a plane substantially parallel with the surface of such article, and a wheel or roller carried by said presser-plunger and adapted to effect the union of the adhesive strip with the article by a rolling action. We use what we have termed a "presser-plunger" carrying a wheel or roller, in contradistinction to a slide carrying a wheel or roller, and reciprocating on a fixed bar overhanging the support for the article to which the strip is to be applied, or on a pivoted bar having a spring connection with a fixed bar, as shown in patent to Wilson, No. 545,996, dated September 10, 1895. In the latter case the overhanging bar is objectionable since it interferes with the free access to the support for the article being operated upon and for other reasons; and, further, it forms an abutment against which the slide carrying the roller bears to secure the desired pressure. Our construction differs, in that we employ what we term a "presser-plunger," which is a part in itself of sufficient size to effect the pressure without the aid of an over-

hanging abutment, and when withdrawn there is nothing to interfere with the free access to the support for the article being operated upon.

Means may also be provided, adapted to cooperate with the parts already referred to, for the purpose of feeding the adhesive strip and for the purpose of cutting off at each operation the proper length from a continuous strip.

Various other devices and details of construction, specially adapted for the particular use to which the machine is to be put, may also be provided, and some of such devices and details will be particularly described hereinafter.

For the purpose of enabling our invention to be clearly understood we have shown and described herein a complete machine which embodies our invention in a practical and desirable form, and the machine which we have so chosen for purposes of illustration has been designed with especial reference to its use in applying stay-strips of paper, cloth or other material to the corners of pasteboard or other like boxes, but it will be understood that it is not intended thereby to limit the invention to machines of this particular character nor to the exact construction and arrangement of parts shown in such machine.

In the accompanying drawings, Figure 1 is a side elevation of a machine of the character referred to with the supporting-standard broken off and with the arm which supports the strip-reel in section. Fig. 2 is a plan view of the machine. Fig. 3 is a front elevation thereof with the standard broken off. Fig. 4 is a detail view in section on the plane indicated by the line 4-4 of Fig. 2. Fig. 5 is a detail view in section on the plane indicated by the line 5-5 of Fig. 1. Figs. 6, 7, and 8 are detail views illustrating modifications in form of the supporting-arm and presser-roll, according to the nature of the work to be performed, as hereinafter referred to.

The mechanism which embodies our invention may be secured to a suitable standard A, of convenient height, which it is not necessary to show in full. To a vertical cheek-plate A', which is formed on or secured to the standard A, is secured a vertically-adjustable bracket B, having a suitably-formed arm B' to support the box or other article during the operation of applying the stay-strip thereto. It is desirable that the upper surface of this arm B' should conform to the shape of the box at the place where the stay-strip is to be applied. As shown in Figs. 2 and 3, it is substantially rectangular to conform to the corner of a rectangular box. As shown at B² in Fig. 6, the arm is formed to support the angle of an octagonal box. As shown at B³ in Fig. 7, the arm has a curved upper surface to support a round box, and as shown at B⁴ in Fig. 8 the arm has a flat upper surface to support any flat article which may be laid thereon. The bracket B is slotted, as at b, to receive the bolts b' by which it is secured to the cheek-

plate A', and the latter is provided with a horizontal arm a to receive a vertically-disposed adjusting-screw a', by means of which the bracket B and arm B' may be set at any desired height and there secured by tightening the bolts b', a lock-nut a² being provided for the screw a'. Upon the standard A is also secured a horizontal bed-plate C, upon which in suitable ways c-c a presser-plunger D is mounted to slide in a horizontal plane—that is to say, in a plane which is substantially parallel with the upper surface or edge of the box or other article supported by the arm B'. The reciprocating presser-plunger D carries a wheel or roller E', which conforms to the upper surface of the box or other article to be operated upon, and is adapted to roll to and fro over the previously-gummed stay-strip which has been laid in position upon the box or other article, thereby effecting the firm adhesion of such strip to such box or other article.

In order that the wheel or roller E' may conform to the inequalities of the article over which it rolls and may adapt itself to different thicknesses, as well as for the purpose of enabling it to act with a somewhat yielding pressure, it is carried in the ends of a yoke F, which is mounted to slide vertically in suitable ways formed in the presser-plunger D. A screw-threaded stud D', which is fixed to the presser-plunger D, passes through an aperture in the yoke F and receives a compression-spring d and adjusting and lock nuts d', by means of which pressure upon the wheel or roller E' may be regulated as desired. The spindle E, upon which the wheel or roller E' is mounted to revolve, is guided in slots d² which are formed in cheek-pieces d³ depending from the presser-plunger D, and the ends of the spindle E may be provided with nuts and washers e to prevent longitudinal displacement of the spindle. The reciprocation of the presser-plunger D with the wheel or roller E' may be effected by any suitable means. We have represented a shaft G as mounted in a suitable bearing C' on the bed-plate C and as provided with a crank-disk G' and crank-pin G² which is connected to the presser-plunger D by a link G³.

As stated hereinbefore with respect to the supporting-arm B', it is evident that the working face of the wheel or roller E' should conform to the upper surface of the box or other article operated upon, as shown at E², E³ and E⁴ in Figs. 6, 7 and 8.

The strip of paper, cloth or other material which is to be applied to the box or other article is preferably coated with dry adhesive and supplied from a reel or spool H, which is mounted to revolve freely on a spindle h carried by an arm or bracket I which is secured to a plate A'. The bracket I supports a tank I', which contains water for moistening the adhesive strip and which carries in its side walls the bearings for a moistening-roll J and a feed-roll K, between which the strip passes

on its way toward the box or other article on the support B'. The feed-roll K has formed near one end, as shown by dotted lines at $\frac{1}{2}$ in Fig. 5, ratchet-teeth which are adapted to be engaged by a pawl L. The latter is carried by an arm L, which is pivoted on the pintle of the roll K and is connected by a link L' to one end of a bell-crank lever L², which is pivoted upon a stud c', secured to the bed-plate C, and has at its other end a roller R². A cam D² is secured to the reciprocating presser-plunger D to co-operate with said bell-crank lever L² to effect, through the described connections, the forward movement of the feed-roll K just as the presser-plunger D commences its forward movement. The return movement of the bell-crank L², link L' and pawl-carrying arm L is effected by a suitable spring L³.

For the purpose of cutting off the successive portions of the gummed strip as it is fed forward we prefer to form the side of the wheel or roller E' which is nearest the spool or reel H with a sharp cutting-edge, as shown at e' in Figs. 2 and 3, and to provide the bracket I with a co-operating cutting-edge i, as shown in Figs. 2, 3 and 5, whereby, as the wheel or roller E' moves forward, the portion of the gummed strip is severed and is immediately laid upon the box or other article as the wheel or roller continues to advance. It is desirable to provide means for holding the strip firmly while it is being cut and to release it when it is to be fed forward. For this purpose we secure to the bracket I a spring clamping-plate M, which overlies the delivery-plate N and is pressed down upon the same, to clamp the strip which passes between the two, by a finger d⁴ which is carried by one of the depending cheek-pieces d³ on the presser-plunger D. The spring M is so formed, as clearly shown in Fig. 4, as to be cleared by the finger d⁴ when the presser-plunger D is in its extreme rearward position and the crank-pin G² is passing through its dead-center, so as to release the strip and permit it to be fed forward by the action of the feed-roll K which takes place as the presser-plunger begins its forward movement.

The moistening and guiding devices for the stay-strip are substantially the same as shown in Patent No. 537,205, dated April 9, 1895.

In the use of our machine the box or other article to which the adhesive strip is to be applied is placed in proper position upon the supporting-arm B', and by means of a suitable starting and stopping device, which is represented at G⁴ and is under the control of the operator, the engagement of the continuously-rotating fly-wheel G⁵ with the shaft G is permitted, it being assumed that the reciprocating presser-plunger D was brought to rest in its extreme rearward position. As the presser-plunger starts forward the gummed strip is fed forward into position over the box or other article to which it is to be applied and into the path of the advancing wheel or roller E'. The spring-clamp M is pressed

down to hold the strip in place as soon as the feed ceases, and the wheel or roller E', with its cutting-edge e', then severs the projecting portion of the strip, which is immediately laid on the box by the wheel or roller E' in its continued forward movement. In its rearward movement the wheel or roller E' again passes over the severed portion of the strip, and, although there may have been a tendency of such portion of the strip to curl up after the first passage of the roller, it is found that the second passage of the roller effectually checks such tendency and accomplishes a firm adhesion of the strip to the box or other article.

It will be obvious that various alterations in the details of construction and arrangement herein shown and described may be made without departing from the spirit of our invention, and that we do not intend to restrict the invention to the precise construction herein shown, nor, as hereinbefore pointed out, to the particular use for which the machine herein shown is intended.

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

1. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a presser-plunger to reciprocate in a direction substantially parallel with the surface of the box or other article and a roller carried by said presser-plunger and having its working face conformed to the surface of the box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, substantially as shown and described.

2. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a presser-plunger which reciprocates in a direction substantially parallel with the surface of the box or other article, means to feed forward an adhesive strip over the box or other article, and a roller carried by said head and having its working face conform to the surface of the box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, substantially as shown and described.

3. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other articles, a presser-plunger reciprocating in a direction substantially parallel with the surface of the box or other article, a vertically-movable yoke carried by said presser-plunger, and a roller carried by said yoke and having its working face conformed to the surface of said box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, substantially as shown and described.

4. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a

presser-plunger reciprocating in a direction substantially parallel with the surface of the box or other article, a vertically-movable yoke carried by said presser-plunger, a spring arranged to press said yoke yieldingly toward said support, and a roller carried by said yoke and having its working face conformed to the surface of said box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, substantially as shown and described.

5. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a presser-plunger reciprocating in a direction substantially parallel with the surface of the box or other article, a roller carried by said presser-plunger and having its working face conformed to the surface of said box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, a feed-roll to feed the adhesive strip forward, a cam carried by said reciprocating presser-plunger, and intermediate connections whereby the movement of said cam with said presser-plunger is caused to effect a forward rotation of said feed-roll, substantially as shown and described.

6. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a presser-plunger reciprocating in a direction substantially parallel with the surface of the box or other article, a roller carried by said presser-plunger and having its working face conformed to the surface of said box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other

article and to roll over the same, feeding mechanism for said strip, and a cutting device for said strip carried with said reciprocating presser-plunger, substantially as shown and described.

7. In a machine for applying adhesive strips to boxes and other articles, the combination of a support for the box or other article, a presser-plunger reciprocating in a direction substantially parallel with the surface of the box or other article, a roller carried by said presser-plunger and having its working face conformed to the surface of said box or other article to be operated upon and arranged to lay the adhesive strip upon said box or other article and to roll over the same, feeding and rotary cutting mechanism for said strip, a spring-clamp disposed above said strip, and a finger carried by said presser-plunger and arranged to co-operate with said spring-clamp to press the same upon the strip to hold said strip, substantially as shown and described.

8. In a machine for applying adhesive strips to boxes and other articles, the combination of a reciprocating presser-plunger, feeding mechanism for the adhesive strip, devices carried by said reciprocating presser-plunger to press the strip upon the box or other article and a cutting device also carried by said presser-plunger to sever a portion of said strip as the reciprocating presser-plunger advances, substantially as shown and described.

This specification signed and witnessed this 8th day of January, A. D. 1896.

HORACE INMAN.
HARRY A. INMAN.

In presence of—
ROBT. N. CLARK,
H. B. WALDRON.