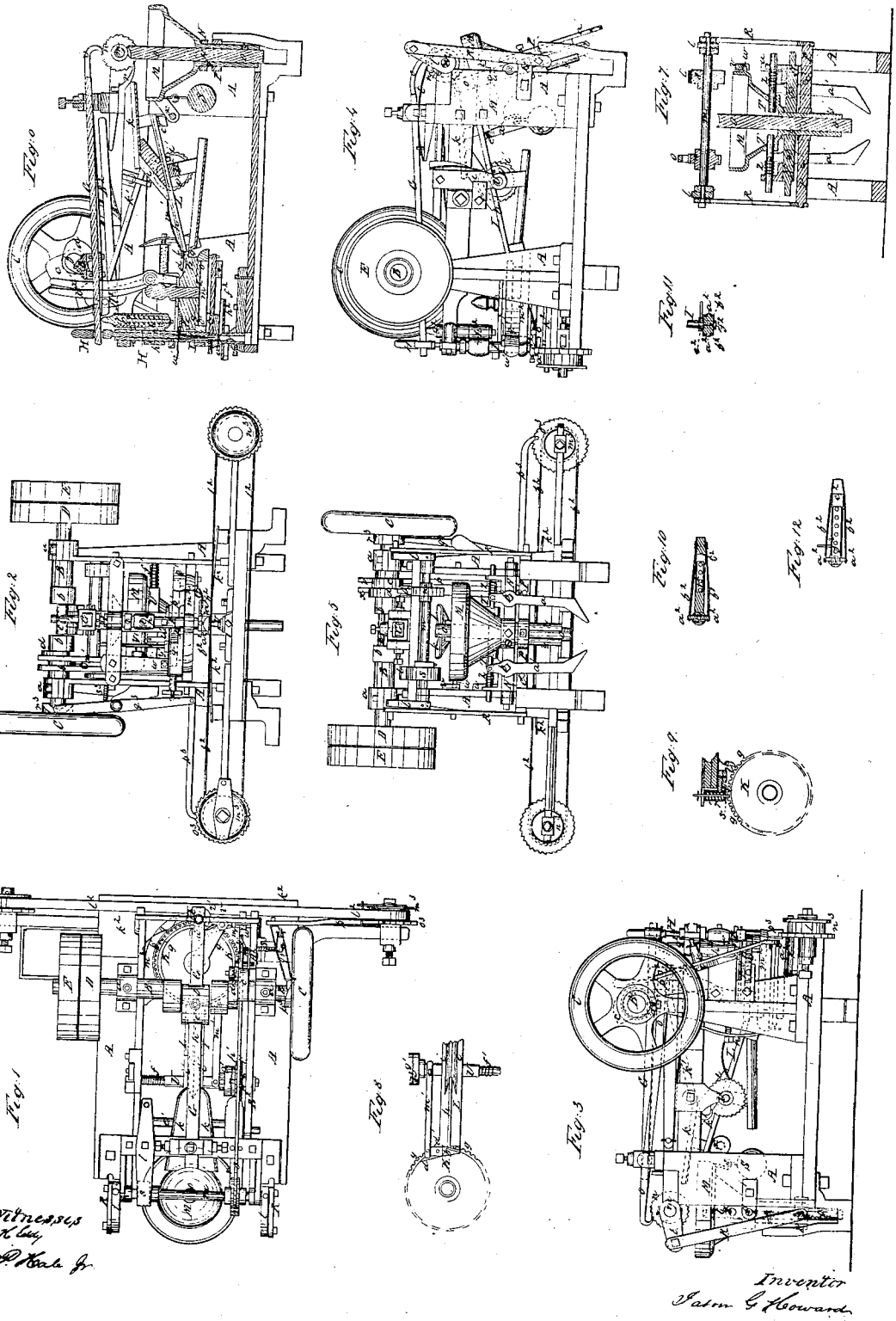
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J. G. HOWARD.

MACHINE FOR APPLYING WASHERS TO TACKS.



Witnesses
R. K. Lay
C. A. Peabody Jr.

Inventor
Jason G. Howard

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JASON G. HOWARD, OF SOUTH BRAINTREE, MASSACHUSETTS.

MACHINE FOR APPLYING WASHERS TO TACKS.

Specification of Letters Patent No. 29,595, dated August 14, 1860.

To all whom it may concern:

Be it known that I, JASON G. HOWARD, of South Braintree, in the county of Norfolk and State of Massachusetts, have invented an Improved Machine for Applying Washers to Tacks; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1, is a top view; Fig. 2, a front elevation; Figs. 3 and 4, side elevations; Fig. 5, a rear end view, and Fig. 6, a vertical, central and longitudinal section of it.

The nature of my invention or improvements consist as follows, viz: In a combination and arrangement of a lifter and a vibratory hopper, or their mechanical equivalents with a tack adjusting chute; also, in the arrangement and combination of agitating mechanism with the lifter and vibratory hopper; also, in the combination of a notched tack receiver, or carrying wheel and a separating mechanism, with the adjusting tack chute, the vertical tack receiver tube and its mechanism for driving the tack into the leather; also, in arranging and combining with the tack adjusting chute as described, mechanism for agitating the same laterally in manner and for the purpose as hereinafter set forth; also, in combining the tack guiding nippers of the tack receiving tube with the punch plate carrier as to be movable therewith; also, in the combination of a spring presser with the tack receiver and its operating arm; also, in the combination of an auxiliary discharger with the carrying wheel and tack receiving tube; also, in the combination of a spring and lever or plate with the chute and carrying wheel and to operate substantially as and for the purpose hereinafter described.

In the drawings, A, represents the frame of the machine, the same being made to support in boxes or bearings *a*, *a*, a driving shaft B. The said shaft is furnished with a fly wheel C, and fast and loose pulleys, D, E, they being arranged on it as shown in the drawings. Furthermore, such shaft has a bill crank *b*, and two cams, *c*, *d*, applied to it. The crank works in a box or carriage *e*, which slides upon a lifter bar or lever, G, having its fulcrum at its rear end and at its front end being jointed to the tack plunger or driver, H. The said plunger slides vertically within a tack receiving tube I, which is situated at the front part of the machine and is provided with a notch or opening *f*, arranged in its rear side and for the reception of a horizontal wheel K, having its periphery formed with a series of recesses *g*, *g*, for the reception and holding of tacks while arranged with their axes vertically. In rear of the said wheel is a tack adjusting chute L, which is placed at an inclination to the horizon and the wheel as shown in the drawings and has a vertical slit or opening *h*, proceeding from a V shaped groove *i*, which leads downward from a shovel formed receiver *k*, the whole being as shown in the drawings. The chute L, is thus composed of three separate parts, *h i k*, into the latter of which the tacks are received and by it discharged into the second part. While falling down the part, *i*, they turn heads foremost and drop points downward into the opening *h*, down which they pass arranged or standing in vertical positions and in this manner are delivered successively into the recesses *g*, *g*, of the wheel K.

In rear of the chute L, is a vibratory hopper M, for holding the tacks. This hopper is supported by a rocker shaft N, and has a cylindrical rod or lifter O, applied to it in such manner as to be capable of rising or falling within it. The upper end of the said lifter O, is concave or cup shaped, the purpose of the lifter being to raise from the hopper, a quantity of tacks and discharge the same upon the rear portion of the chute L. In order to accomplish this the lifter is supported by a horizontal bar P, which is arranged below the rocker shaft N. At its two opposite ends, such bar P, is jointed to two connecting rods R, R, that are suspended respectively from cranks *l*, *l*, carried by a rotary shaft, *m*, arranged as shown in the drawings. This shaft *m*, carries a ratchet *n*, affixed on it. Such ratchet being actuated by a draw pawl *o*, jointed to an upright lever, *p*. The said lever rests against and is moved in one direction by means of the cam *c*, hereinbefore mentioned. In this way while the shaft B is being revolved, the shaft *m*, will have an intermittent rotary movement imparted to it such as will gradually effect the elevation of the lifter O, within the hopper. A spring retaining pawl *r*, applied to the ratchet *n*, serves to prevent a reversed movement of the ratchet while the draw pawl is being impelled forward. A friction roller *s*, and a

spring brake t, may be applied respectively to the shaft m, and the frame, A, the same being as shown in the drawings. The brake, by resting and bearing on the periphery of the said roller serves to prevent the too sudden descent of the tack lifter O, within the hopper.

A weight S, is suspended from the front part of the hopper as shown in Fig. 6. Furthermore, there is affixed to the bar P, an arm u, as shown in Fig. 5. This arm during the elevation of the said bar lifts a lever latch v, whose notch embraces a pin w, projecting from the hopper. As soon as the said notch may have been lifted clear of the pin, the weight S, will tip the hopper suddenly, so as to carry the upper end of the lifter toward the receiving end of the chute L, the hopper being brought up against an arm x, that projects from the frame A. As the hopper will be arrested in its forward motion, the tacks that may be in the upper end of the lifter will be thrown forward into the chute by the momentum generated in them. By the descent of the bar P, which embraces and slides in a tailpiece or arm y, extending downward from the hopper, the said hopper will be moved backward or restored to a vertical position during which time the lifter O, will perform a descent within the hopper.

In order to insure a mass of tacks being deposited in the cavity at the top of the lifter, the hopper is furnished with one or more agitators, T, T, see Fig. 5, and also Fig. 7, which is a transverse section taken through the hopper and the said agitators. These latter consist of two slide rods or pistons supported in suitable guides so as to be capable of sliding forward and backward horizontally into the hopper. They have springs 2, 2, applied to them for the purpose of moving them toward one another, their movements in opposite directions being effected by means of bent levers a', a', whose fulcra b', b', are supported by the rocker shaft N. During the elevation of the bar P, projections c', c', are brought against the inclined feet of the levers a', a', and move them inward so as to produce the withdrawal of the agitators in directions away from the lifter.

In consequence of the sudden depression of the bar P, as hereinbefore described, the agitators will be forced by their springs toward the lifter O, and in such manner as to loosen or agitate the mass of tacks that may be in the hopper, and cause a portion thereof to be moved directly over and into the hole or concave top of the lifter. The chute L, is supported by a rocker shaft U, arranged as shown in the drawings. Furthermore, the front end of the chute is upheld by means of an extension d', which rests directly upon the carrying wheel K, and is pressed down upon the same by a spring e'. Such spring is attached to the frame A, and bears against the under surface of the rear part of the chute. The rocker shaft U, is pressed in one direction by means of a spring f', coiled around it, such shaft being made to support a clutch wheel g', which operates in connection with another clutch wheel h', and is furnished with a ratchet i'. This latter clutch wheel (h') turns freely on its shaft and is operated by means of a draw pawl k', jointed to the lever p, hereinbefore mentioned. The teeth of the clutch wheels g', and h', are so formed as to enable the latter wheel, while rotating the length of a tooth to press away from it the other clutch wheel and its shaft, the spring f', afterward serving to produce a counter movement of them. The ratcheted clutch is to be supported so as to have no endwise movement. From the above, it will be seen that by means of the two clutch wheels g', h', the spring f', and draw pawl k', applied to the lever P, lateral agitating movements will be imparted to the chute during the revolution of the said ratcheted wheels. Such agitating movements will cause the tacks that may be on the rear part of the chute to descend the chute and properly arrange themselves therein.

There is applied to the lower end or to the extension d', of the chute L, a thin lever plate l', formed in top view as shown in Fig. 8, which represents the said lever plate, its arrangement relatively to the wheel K, and the chute L. This lever plate has its inner arm borne toward the discharging conduit or groove of the chute by means of a spring m', properly applied to the outer arm of said lever and to the rocker shaft U. In this way, the said lever plate l', though serving as a stop or abutment for the lowermost tack to rest against will give way and allow the tack to escape from the chute whenever such tack may be imperfect or be bent the escape of the tack or its removal from the chute being effected by the wheel K. Such wheel K, is supported upon a stationary shelf m^2, and revolves within a circular recess o', made in the shelf. A curved guard plate p', rests on the said shelf, extends partially around the periphery of the wheel K, and is borne up against the same by a spring q'. The purpose of the said guard is to maintain the tacks in place within the recesses of the carrying wheel, while they may be passing from the chute to the receiver tube I, hereinbefore described.

The tack carrying wheel K, has an intermittent rotary motion imparted to it, the same being effected by the lever p, and a spring pawl r', jointed to the foot of the lever. A horizontal section of the spring pawl r', and its arrangement with reference to the said parts K and p, are represented

in Fig. 9. The pawl consists of two principal parts, viz., a spring catch s', and its carrier t', arranged and applied together, as shown in said Fig. 9. Besides the notched wheel K, for carrying the tacks to their receiver I, there is a mechanism for removing a tack from the wheel and into the receiver I. This mechanism consists of a lever u', (see Figs. 1, and 6,) that turns horizontally upon a fulcrum v', and projects in rear of the tack or is arranged with respect to the wheel K, and tack receiver I, as shown in the drawings. The said lever u', is pressed toward the tack wheel K, by means of a spring w', and at a proper time is moved in an opposite direction by the cam d, which actuates the lever x', arranged and connected with the lever u', by a pitman y', as shown in Figs. 1, 6, and 7. By such lever u', and its actuating mechanism as described, each tack in succession will be discharged from the carrying wheel K, and into the receiving tube I, and in case any tack by reason of its imperfect form or otherwise should not be so removed from the wheel, it (the tack) during the rotary movement of the wheel will be carried against an auxiliary separator or stationary cam z', which will discharge it from the wheel. This will take place after such tack may have been carried by the wheel horizontally out of and beyond the receiver I.

Underneath and in line with the receiving tube I, there is a stationary punch V, between which and the said tube there is a pair of spring jaws or nippers a^2, a^2, a horizontal section of which, their springs and bars or supporting frame c^2, is exhibited in Fig. 10. Fig. 11, is a transverse section of such jaws or nippers their supporting frame and the tack receiver I. The inner end of each nipper or jaw a^2, is formed with a semiconical recess to receive the tack, the outer end being attached to one of two springs b^2, that are affixed to the frame c^2. The jaws slide freely into the frame c^2, and give way under the pressure of a tack while being driven downward between them. They serve to receive the tack and properly direct it into or about into the axis of the tubular punch V. By applying the jaws or nippers to the part c^2, they are removable therewith from the tube I. This application is specially convenient and useful in many respects. Furthermore, the frame c^2, may be termed the punch plate carrier for the reason that it serves to support a punch plate f^2, which is screwed to the underside of it and formed as shown in the drawings, and particularly in Fig. 12, which is an underside view of the said punch plate and the parts adjacent thereto. This punch plate is a simple strip of metal provided with a series of holes arranged at suitable distances apart each hole being of a diameter less than that of the bore of the punch V, one hole of the punch plate being arranged directly over and concentrically with the punch. The said part c^2, is fastened to the lower end of the tube I, so as to be movable therewith toward the punch, such tube I, being supported so as to be capable of having vertical movements imparted to it. It is pressed downward by the action of the lifter bar G, which during its descent strikes upon a spring presser g^2, that is sustained by a hollow arm h^2, from a tube I. The said presser consists of a spring and a slider arranged and applied to the arm h^2, as shown in the drawings, and it serves to enable the leather cutting mechanism to readily adapt itself to leather of any thickness that may be used as well as to leather of a variable thickness. The upward motions of the tube I, are produced by a spring i^2, arranged underneath and applied to the shelf m^2.

A rest or bearing plate k^2, is arranged with reference to the punch V, as shown in the drawings. An endless band l^2, rests and runs on this bearing plate and alongside of the punch, such band being disposed with respect to the said plate and supported by two pulleys m^3, n^3, as shown in the drawings. One of these pulleys carries a ratchet wheel o^3, that is actuated by an impelling pawl p^3, the said pawl being jointed to the lower end of a lever q^3, arranged as shown in the drawings. This lever is moved in one direction by a cam r^3, and in the other by a spring s^3, the whole being for producing an intermittent movement of the endless belt such as while a piece of leather may be pressed upon it will cause such piece to be moved along over the punch V, and to rest thereon in manner as may be required to cause such leather to be perforated with tacks and a washer of leather to be separated from the piece, and with, and on each tack.

In order to arrest, at any time, the operation of the vibrating hopper, the lifter thereof, the chute and the conveying wheel, it will only be necessary to retain the lever p, in its farthest forward position. This may be accomplished by means of a pin A^2, and a lever, B^2. The said pin projects from the lever, p, and when the front arm of the lever, B, is down on the frame A, its end will serve as a stop for the pin to abut against. While the lever arm is elevated above the path of motion of the pin, the lever p, can move or be kept up to its cam.

The operation of the above described machine is as follows: Tacks after being placed in the hopper M are discharged therefrom into the chute L, in manner as above described. By means of such chute they are properly arranged for being successively delivered heads upward into the wheel, K,

and by it they are carried to the receiver, I, into which they are discharged by mechanism as hereinbefore explained. After each tack passes into the said tube I, it drops downward between its spring jaws or nippers, a^2, a^3, and are held by them in a proper manner to be driven downward and expelled from them by the plunger, H, which during the descent of the bar, G, will be forced downward so as to drive the tack into the piece of leather far enough for the head of the tack to rest thereon, after which the further descent of the bar G, will cause the punch plate, f^3, to be pressed downward sufficiently to cause the punch, V, to separate a washer from the leather. This washer with the tack extending through it will next fall through the hollow punch and be discharged from the machine.

I claim—

1. The combination and arrangement of the lifter O, and vibrating hopper, M, or their equivalents with the tack adjusting chute L, the same being made to operate together, substantially as hereinbefore explained.

2. The combination of the agitators T, T, or their equivalent with the lifter O, and the vibrating hopper, M, the said agitators being made to operate therewith substantially as and for the purpose specified.

3. The combination of the notched tack receiving and carrying wheel, K, and the lever u', or the tack separating mechanism as described, with the adjusting chute L, receiving tube I, and its mechanism for driving the tack into the leather as described.

4. Arranging and combining with the tack adjusting chute L, mechanism for agitating the same laterally in manner and for the purpose set forth.

5. Combining the nippers or jaws a^2, a^2, with the punch plate carrier c^2, so as to be movable therewith substantially as described.

6. The combination of a spring presser g^2, as described with the tack receiver I, and its operating arm or lifter bar G.

7. The combination of the auxiliary discharger Z', with the carrying wheel, K, and the receiving tube I.

8. The combination of the lever plate l' and its spring m', or equivalent mechanism with the chute L, and the carrying wheel, K, the said lever plate being arranged in manner and to operate with the chute and wheel as explained.

JASON G. HOWARD.

Witnesses:
R. H. EDDY,
F. P. HALE, Jr.