

H. A. STONE.
NAIL DELIVERING MACHINE.
APPLICATION FILED OCT. 8, 1919.

1,372,255.

Patented Mar. 22, 1921.

2 SHEETS—SHEET 1.

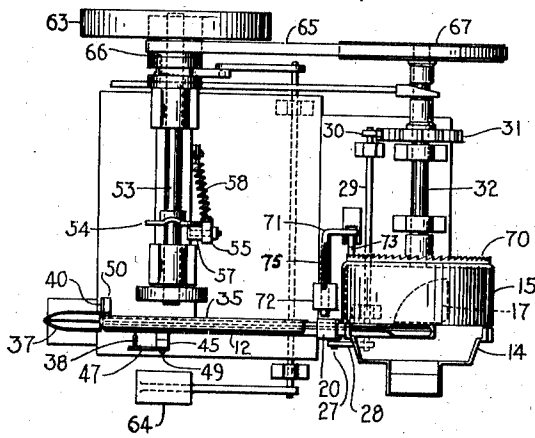


FIG. 1.

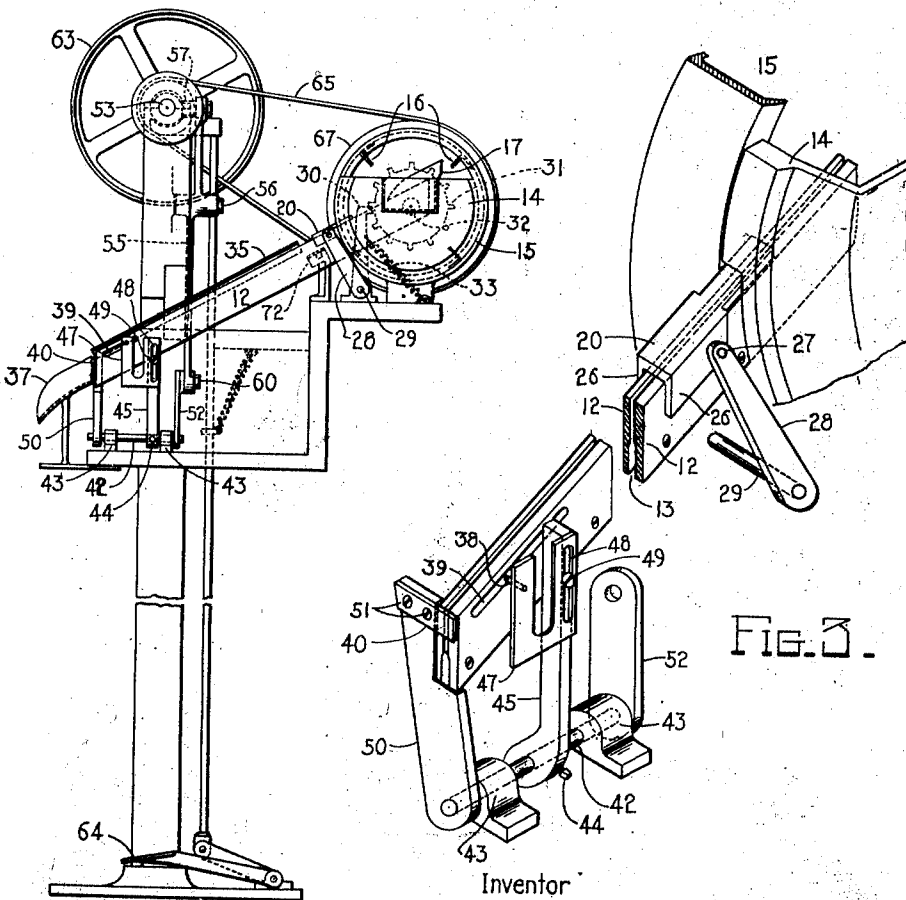


FIG. 2.

Inventor

Harry A. Stone
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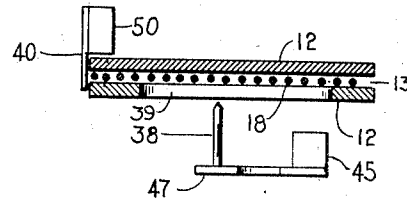


FIG. 5.

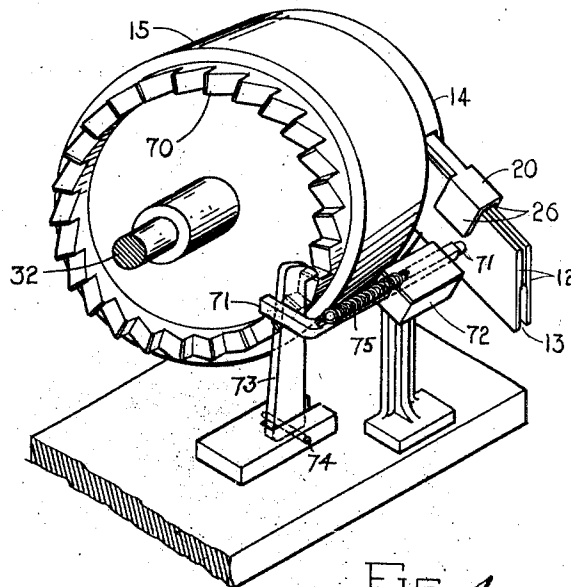


FIG. 4

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UNITED STATES PATENT OFFICE.

HARRY A. STONE, OF BROCKTON, MASSACHUSETTS.

NAIL-DELIVERING MACHINE.

1,372,255.

Specification of Letters Patent.

Patented Mar. 22, 1921.

Application filed October 8, 1919. Serial No. 329,311.

To all whom it may concern:

Be it known that I, HARRY A. STONE, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented new and useful Improvements in Nail-Delivering Machines, of which the following is a specification.

This invention relates to a machine for automatically delivering loose nails in groups of any desired number, into an envelop or package held by hand for the reception of the nails, one use of the machine being to deliver at one operation, into an envelop, the number of nails required to attach a pair of rubber heels, the charged envelop being associated with a pair of heels, when the same are marketed.

The invention is embodied in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a top plan view of a machine embodying the invention.

Fig. 2 is a side view of the same.

Fig. 3 is a fragmentary perspective view illustrating parts of the machine.

Fig. 4 is a fragmentary perspective view illustrating other parts of the machine.

Fig. 5 is a fragmentary sectional view, showing the lower end portion of the raceway, and the separating finger and detent hereinafter described.

The same reference characters indicate the same parts in all of the figures.

The machine comprises an inclined raceway composed of parallel bars 12, 12, separated by a channel 13, which is widened at its lower portion to permit headless nails to drop through it. The upper end of the raceway projects into a fixed hopper member 14, and is supplied with nails by a rotary tumbling drum 15 having internal buckets or flanges 16 which alternately raise the nails and drop the same into a fixed tray 17 formed to guide the nails into the upper end of the raceway. The nails 18 which drop into the channel 13 in such position that their heads bear on the upper edges of the raceway bars 12, slide down the raceway.

To prevent the clogging of the nails at the upper or nail-receiving end of the raceway, I employ a reciprocating slide 20 located above the upper edge of the raceway and having downwardly projecting flanges

26. To one of these flanges is pivoted at 27 a rocker arm 28, fixed to a rock-shaft 29, which is journaled in fixed bearings and is provided with a tappet arm 30. The rock-shaft and its arms are oscillated by the alternate action of a spur wheel 31, fixed to a driving-shaft 32 and engaging the tappet arm 30, and a spring 33 which presses the tappet arm toward the spur wheel, the arrangement being such that the slide 20 is reciprocated, so that the upper end, which projects into the hopper member 14, acts to remove from the portion of the raceway within the said hopper member, any nails improperly positioned on the raceway.

35 represents a fixed inclined guiding flange attached to one of the raceway bars 12, and projecting over the channel 13, to prevent upward displacement of the nails. The lower end of the raceway is unobstructed when the detent 40 hereinafter described is displaced from its operative position, so that nails may escape into space in the direction of their travel in the raceway.

At the lower end portion of the raceway is a let-off mechanism adapted to segregate from a row of nails, a predetermined number or group and release the same into a chute 37, adapted to deliver the nails to an envelop held by the operator for their reception. Said let-off mechanism includes a chisel-pointed separating finger 38, movable crosswise of the raceway in a slot 39 formed in one of the bars 12, and a detent 40, movable crosswise of the raceway at the delivering end thereof. The said finger and detent are connected for simultaneous movement and are so moved in unison that when the detent 40 is in position to arrest the nails, the finger 38 is withdrawn from the channel, and when the finger enters the channel and separates the shanks of two nails therein, the detent is withdrawn and permits the escape of the nails below the finger, the finger acting to force the segregated nails downward.

The preferred means for connecting and operating the said finger and detent will be next described.

42 represents a horizontal rock-shaft journaled in fixed bearings 43 adjacent to the lower end of the inclined raceway. To said rock-shaft is adjustably secured as by a set screw 44, an arm 45, carrying the separating finger 38. Said finger is preferably yieldingly connected with the arm 45, and

at the same time rendered adjustable lengthwise of the arm, by a resilient forked plate 47, to one arm of which the finger is secured. The other arm of said plate has a longitudinal slot 48, receiving a screw 49, which clamps the plate 47 to the arm 45.

50 represents another arm fixed to the rock-shaft 42, and carrying the detent 40, the latter being rigidly attached as by screws 51, to the arm 50.

To the rock-shaft 42 is fixed another arm 52, forming an element of the mechanism whereby the rock-shaft and its arms 45 and 50 are oscillated. 53 represents a driving shaft, having a cam 54. 55 represents a two-armed lever fulcrumed at 56 to a fixed support. One arm of the lever 55 has a trundle roll 57, which is pressed by a spring 58 against the cam 54, the latter being formed to cooperate with the spring in oscillating the lever 55. The other arm of said lever is pivoted at 60 to the rock-shaft arm 52.

It will now be seen that the rotation of the shaft 50 and cam 54 cause the described movements of the separating finger 38 and detent 40 through the described connections.

The adjustability of the arm 45 on the rock-shaft 42, and the adjustability of the finger-carrying plate 47 on the arm 45, permit various adjustments of the separating finger 38, so that any desired number of nails may be segregated at each operation. The arm 45 is adjustable horizontally on the horizontal rock-shaft, and the finger 38 is adjustable vertically on the arm 45, to compensate for horizontal adjustments of said arm.

The shaft 53 is the main driving shaft, and may be driven by a belt running on a pulley 63, which may be connected with the shaft 53 by any suitable clutch mechanism organized to be made operative by a treadle 64, and to be rendered automatically inoperative to stop the rotation of the shaft after each complete rotation.

The shaft 32 is driven by a belt 65, running on a pulley 66, associated with the driving shaft, and on a pulley 67, associated with the shaft 32. The pulley 67 may be connected with the shaft 32 through a suitable clutch adapted to be made alternately operative and inoperative. The drum 15 is fixed to and rotated by the shaft 32, and is provided with a series of teeth 70, constituting an element of means for reciprocating a hammer formed by a bent rod 71, movable in a fixed guide 72, and adapted to strike one side of the raceway to jar the nails therein and facilitate their downward movement.

The hammer rod 71 is reciprocated and caused to percussively strike the raceway, by the teeth 70, a tappet arm 73 pivoted to a fixed support at 74, and a spring 75 at-

tached at one end to the guide 72, and at the other end to the rod 71, the spring pressing the rod against the arm 73, and also pressing said arm against the teeth 70.

Owing to the inclination of the upper edge of the raceway, the finger 38 which enters the raceway above the lower end of the latter, is higher than the detent, which is arranged to move across said lower end. The finger must be located relatively near the inclined upper edge of the raceway, in order that it may properly arrest the nails above it in the raceway, and prevent the heads of the arrester nails from tipping forward or toward the lower end of the raceway. The means described for adjusting the finger permit not only a variation of the distance between the finger and the detent 40, but also a variation of the height of the finger above the detent, so that the finger, when in any adjustment of which it is capable, is maintained in suitable proximity to the inclined upper edge of the raceway, and to the heads of the nails supported thereby.

The finger 38 may be conveniently and quickly adjusted by loosening the screws 44 and 49, and then, while the finger is held in the slot 39, moving the arm 45 on the rock-shaft. During this operation the inclined edges of the slot guide the finger, and either raise or depress it to vary its height above the detent. The adjustment is then maintained by tightening the screws 44 and 49.

The location of the finger 38 below the upper edge of the raceway and in position to engage the shanks of the nails is an important factor in securing accuracy of segregation and delivery of nails. The heads of wire nails, formed by the dies of a wire nail machine, are liable to so vary in size and shape that a separating finger or device engaging the heads of the nails cannot infallibly segregate an exact predetermined number of nails at each operation. The form and size of the shanks of the nails are determined entirely by the gage of the wire employed, so that there is no variation which is liable to prevent accuracy of segregation.

I claim:

1. A nail-delivering machine comprising an inclined nail raceway having an unobstructed lower end through which nails may move sidewise in the direction of their travel in the raceway, and formed at its upper edge to support the nails by their heads, with their shanks spaced apart and suspended in the raceway, and an adjustable let-off mechanism adapted to segregate and release a group of nails at each operation, and permit the escape of the segregated nails, said mechanism including a detent movable crosswise of the lower end of the raceway in a fixed path, and adapted to arrest the

lowest nail, a separating finger higher than the detent, movable crosswise of the raceway in a path parallel with that of the detent, and adapted to enter the space between two adjacent shanks at a point below the upper edge of the raceway, and means for adjusting the finger to vary its distance from, and its height above the detent, and thereby vary the number of nails segregated, without substantially varying the distance between the finger and the upper edge of the raceway, means being provided for reciprocating the said detent and finger in unison.

15 2. A nail-delivering machine comprising an inclined nail raceway having an unobstructed lower end through which nails may move sidewise in the direction of their travel in the raceway, and formed at its upper edge to support the nails by their heads, with their shanks spaced apart and suspended in the raceway, and an adjustable let-off mechanism adapted to segregate and release a group of nails at each operation, and permit the escape of the segregated nails, said mechanism including a detent movable crosswise of the lower end of the raceway in a fixed path, and adapted to arrest the lowest nail, a separating finger higher than the detent, movable crosswise of the raceway in a path parallel with that of the detent, and adapted to enter the space between two adjacent shanks at a point below the upper edge of the raceway, a substantially horizontal rock-shaft journaled in fixed bearings adjacent to the lower end of the raceway, a non-adjustable arm fixed to the rock-shaft and carrying the detent, an adjustable arm releasably secured to the rock-shaft and adjustable lengthwise of the latter, and a finger-carrying member adjustable vertically on said adjustable arm, the finger being adjustable by said arm and carrying member to vary its distance from, and its height above the detent.

30 of the raceway in a path parallel with that of the detent, and adapted to enter the space between two adjacent shanks at a point below the upper edge of the raceway, and means for reciprocating said detent and finger in unison, said means having provisions for adjusting the finger to vary its distance from, and its height above the detent, and thereby vary the number of nails segregated, without substantially varying the distance between the finger and the upper edge of the raceway.

3. A nail-delivering machine comprising

an inclined nail raceway having an unobstructed lower end through which nails may move sidewise in the direction of their travel in the raceway, and formed at its upper edge to support the nails by their heads, with their shanks spaced apart and suspended in the raceway, and an adjustable let-off mechanism adapted to segregate and release a group of nails at each operation, and permit the escape of the segregated nails, said mechanism including a detent movable crosswise of the lower end of the raceway in a fixed path, and adapted to arrest the lowest nail, a separating finger higher than the detent, movable crosswise of the raceway in a path parallel with that of the detent, and adapted to enter the space between two adjacent shanks at a point below the upper edge of the raceway, a substantially horizontal rock-shaft journaled in fixed bearings adjacent to the lower end of the raceway, a non-adjustable arm fixed to the rock-shaft and carrying the detent, an adjustable arm releasably secured to the rock-shaft and adjustable lengthwise of the latter, and a finger-carrying member adjustable vertically on said adjustable arm, the finger being adjustable by said arm and carrying member to vary its distance from, and its height above the detent.

4. A nail-delivering machine substantially as specified by claim 3, said carrying member being resilient and yieldingly supporting the finger.

5. A nail-delivering machine substantially as specified by claim 3, the raceway being provided with an inclined finger-receiving slot substantially parallel with its upper edge, and adapted to guide said finger during the operation of adjusting the latter.

In testimony whereof I have affixed my signature.

HARRY A. STONE.