R. F. McFEELY.

TACK SUPPLYING MECHANISM.

APPLICATION FILED MAY 15, 1912.

1,107,337.

Patented Aug. 18, 1914.

2 SHEETS—SHEET 1.

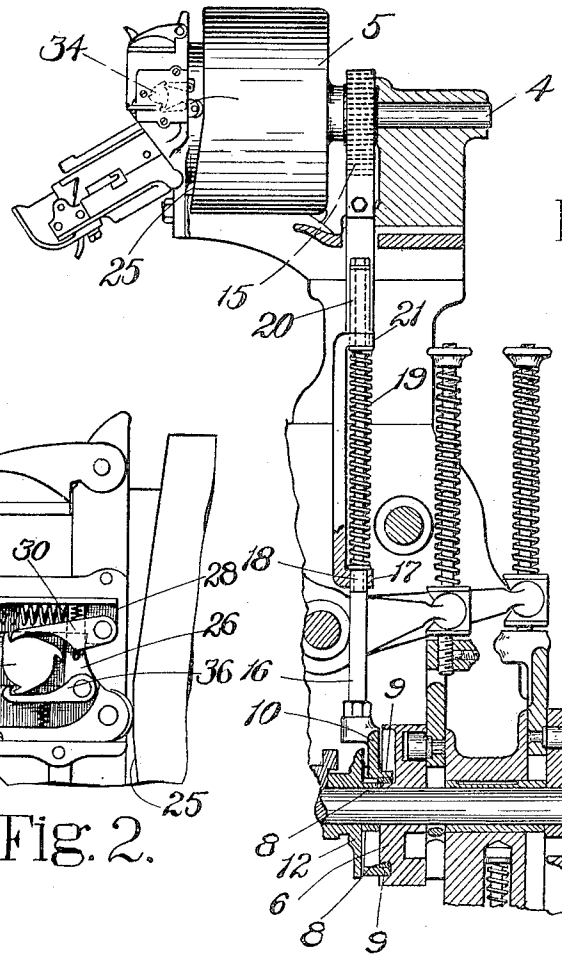


Fig. 1.

Fig. 2.

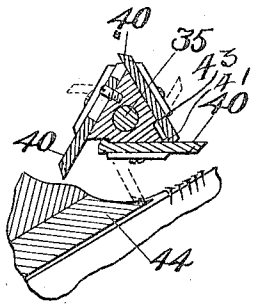


Fig. 3.

WITNESSES.

Elizabeth C. Coope

O. Blanche Hargraves

INVENTOR.

Ronald F. McFeely

By his Attorney,

Nelson W. Howard

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

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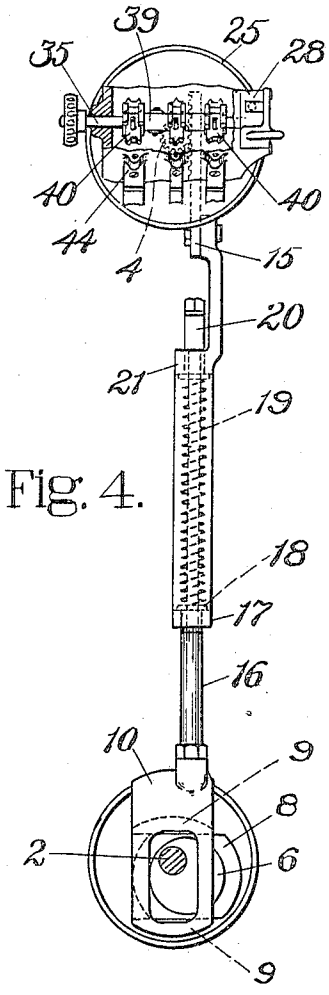


Fig. 4.

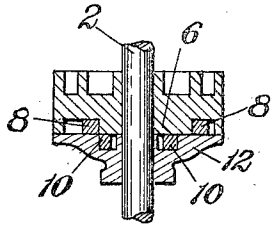


Fig. 5.

WITNESSES.

Elizabeth C. Coyle

A. Blanche Hargraves

INVENTOR.

Ronald F. McFeely

By his Attorney

Nelson W. Morrand

UNITED STATES PATENT OFFICE.

RONALD F. McFEELY, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TACK-SUPPLYING MECHANISM.

1,107,337. Specification of Letters Patent. Patented Aug. 18, 1914.

Original application filed March 23, 1903, Serial No. 149,966. Divided and this application filed May 15, 1912. Serial No. 697,466.

To all whom it may concern:

Be it known that I, RONALD F. McFEELY, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Tack-Supplying Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to tack supplying mechanism and is shown as embodied in certain improvements in the mechanism for this purpose shown in prior United States Letters Patent No. 663,777 granted on my application December 11, 1900.

The object of the invention is to render mechanism of this class less liable to disorder and breakage and to render the mechanism more reliable in furnishing an uninterrupted supply of tacks notwithstanding the imperfections and the variations in the shape and size of commercial tacks which must be handled in automatic machinery of the type shown for example in said Letters Patent.

This application is a division of application Serial No. 149,966, filed March 23, 1903, which has matured into United States Letters Patent No. 1,029,387, granted June 11, 1912, for improvements in pulling over machines.

In my prior construction I employed an oscillating carrier in which was slidingly mounted a clearer arranged to rest by gravity upon the tack chute and to wipe upwardly along the chute for dislodging the tacks from the entrance to the usual covered portion of the tack chute. In its return movement the clearer wiped downwardly along the tack chute to its starting position. It sometimes happened that during this downward wiping movement the clearer would jam the tacks together in a way to cause them to clog the entrance to the covered portion of the chute. In accordance with the present invention this trouble is avoided by eliminating the engagement of the clearer with the tacks in coming back to starting position. As herein shown by way of exemplification, this is accomplished by the use of a rotatable carrier in place of the oscillating carrier of the prior construction. I have ascertained, however, that the desired result may be obtained without the use of the rotatable carrier and it will be understood that the invention is not limited to the use of the rotatable carrier except as definitely specified in certain of the combination claims.

The several features of the invention including certain details of construction and combinations of parts will be understood from the following description and be pointed out in the claims.

Figure 1 shows so much of a machine of the type shown in said patent and application, partly in section and viewed from the right hand side, as is necessary to illustrate this invention; Fig. 2 shows a position when the driving cam shaft has been turned 90°; Fig. 3 shows the tack clearers; Fig. 4 shows a front view of the cam and of the clearer mechanism; Fig. 5 is a horizontal section through the driving cam shaft.

The machine frame has bearings for the driving shaft 2 and for the hopper shaft 4 by which the oscillatory hopper 5 is supported and actuated. On the driving shaft is a cam block having an eccentric 6 embraced by a bushing 8 having plane upper and lower faces proportioned to fit between flanges 9, 9 of a vertically reciprocatory plate 10 that is confined against endwise displacement lengthwise of the shaft by a plate 12.

The plate 10 drives a reciprocatory rack bar 15 through a connection which is capable of yieldingly actuating the bar in both directions and comprises a rod 16 extending through an ear 17 on the bar and having an upper reduced portion carrying a sleeve 18 flanged to confine it above the ear, a spring 19, and a long upper sleeve 20 that is flanged at its lower end and extends upwardly through a second ear 21 on the bar and is confined on the rod by a nut. Upward movement of the plate is transmitted by the rod 16 and sleeve 18 yieldingly through the spring 19 and through the sleeve 20 to the ear 21 to the rack bar 15 while downward movement is transmitted yieldingly in a similar way as will be ob-

vious. The rack bar engages a toothed section of the hopper shaft 4 on which the hopper is fast and therefore the hopper is oscillated yieldingly in both directions whereby there is imparted to the hopper an elastic swinging movement. This machine, the driving shaft 2 of which is geared up to turn at high speed, is actuated in two steps as explained in said Letters Patent and comes to rest automatically at the end of each step. This driving connection for the hopper starts the hopper easily or without shock, the power derived from the quick half rotation of eccentric 6 being stored in the spring 19 and expended in completing the hopper movement after the driving shaft and other parts of the machine may have come to rest and the provision for yielding in both directions permits the hopper to turn more than a half revolution by its momentum and then to swing back again and come to rest easily and without shock. The action has the same advantageous characteristics in the downward as well as in the upward movement of the rack bar. This arrangement enables the hopper, which is provided with internal buckets to lift tacks and empty them upon the chutes as explained in the prior Letters Patent, to drop the tacks on the chutes satisfactorily and without the flinging action which tends to result from a positive drive in a high speed machine.

The front end of the hopper has a cam face 25, as in the prior construction, and a horizontally reciprocatory pawl carrier 26 sliding in ways in the right hand end face of the chute bracket 27 has a roll standing against said face. In the upper portion of the pawl carrier 26 is a plunger 28 carrying a pawl 30 and containing a spring 32 through which the plunger and pawl are driven yieldingly from the carrier and the hopper cam face 25. The pawl engages a three toothed ratchet disk 34 on the right hand end of clearer shaft 35 and turns the shaft one-sixth of a revolution. A second pawl 36 on carrier 26 is arranged below the ratchet disk in position to then interlock with another tooth of the disk, see Fig. 2, and a return spring 38 pushes the carrier 26 toward the hopper and turns the clearer shaft another sixth revolution to bring the third ratchet tooth in front of pawl 30. This provides an independently yielding actuation of the clearer shaft from the hopper which is first yieldingly actuated. Also there is a slight pause or relief in the movement of the clearer shaft midway of each stroke of the clearers carried by the shaft and this occurs while the clearer is in the middle of its stroke and allows it to settle down under the head of a tack to get a good hold, as in dotted lines, Fig. 3, on a tack which may be stuck preparatory to throwing the tack back into the hopper when it completes its stroke by expansion of spring 38.

The clearer shaft 35 has a sleeve 39 fast to it in which are formed as many series of guideways as there are chutes to be cleared and each series comprises three guideways set at angles of 120° to each other. In each guideway a clearer 40 is confined to slide endwise by gravity as the shaft is turned and has a finger for each tack groove in the chute. The chute cover 44 is formed with a curved top face to guide the clearer in wiping engagement therewith to the upper end portion of the chute and into the tack groove and the pause referred to preferably occurs just after the clearer passes from the cover to the chute and preparatory to a further wiping action over the chute. This allows the clearer to dwell among the tacks long enough to settle down into position to be able to throw misplaced tacks off the chute during the next quick advance movement which the clearer has. The same result may be obtained by adjusting the sleeve 39 on the shaft 35 through 60° so that a clearer will come to rest among the tacks, between oscillatory movements of the hopper. If this adjustment is made the pause between the movements effected by the two pawls will allow time for the tacks to settle back down the chute before the second clearer 40 comes among them. The endwise sliding movement of one of the clearer plates in its guideway is limited by a slot and screw as shown in Fig. 3. The other two plates preferably are formed as shown in Fig. 3 with lugs 41 on their heel ends adapted to contact with shoulders 43 on the guide faces of the carrier to limit the movement of said plates outwardly. The reverse movement of each of said plates is limited by contact of its heel end with the following plate as shown at the upper right hand side of Fig. 3. This construction saves the machine work of providing screws and slots for each of the plates.

The clearer shaft 35 may conveniently be provided with a hand wheel, as shown in Fig. 4, constituting means for manually actuating the clearing devices independently of the automatic operation of the machine.

Having described the preferred construction embodying these improvements, I claim as new and desire to secure by Letters Patent of the United States:—

1. A tack supplying mechanism having, in combination, a cylindrical drum hopper mounted to oscillate about its own axis, a chute extending into the hopper and to which tacks are raised and delivered by the rotation of the hopper, a high speed intermittently actuated driving shaft, and connections from the shaft to the hopper directly transmitting movement yieldingly

both forwardly and backwardly to the hopper and allowing the oscillatory movement of the hopper to be completed after the driving shaft has come to rest.

2. A tack supplying mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied by the hopper, a high speed driving shaft which is actuated in two steps with automatically produced dwells between the steps, and connections from the shaft to the hopper transmitting movement yieldingly both forwardly and backwardly to the hopper and comprising an eccentric on the shaft, a rack bar connected with the hopper, a connecting rod extending through a portion of the rack bar at two points, a spring on the rod between said points, and flanged collars abutting on the rod and on the bar to drive the latter through the spring in either direction, substantially as described.

3. A tack supplying mechanism having, in combination, a cylindrical drum hopper mounted to oscillate about its own axis, a chute extending into the hopper and to which tacks are raised and delivered by the rotation of the hopper, a high speed intermittently actuated driving shaft, connections from the shaft to the hopper directly transmitting movement yieldingly both forwardly and backwardly to the hopper, and mountings for the hopper all arranged to permit the hopper to turn in one direction or the other after the actuation of the cam shaft has terminated.

4. A tack supplying mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied by the hopper, means for intermittently turning the hopper, a clearer for dislodging tacks intermittently from a portion of the chute, a reciprocatory pawl carrier arranged to be actuated by the hopper, pawls on the carrier arranged to advance the clearer a portion of an operative stroke during the forward reciprocation of the carrier and to complete the stroke on the return of the carrier.

5. A tack supplying mechanism having in combination, an oscillatory hopper, a chute to which tacks are supplied by the hopper, means for intermittently turning the hopper, a clearer for dislodging tacks intermittently from a portion of the chute, and operating means from the hopper to the clearer arranged to cause the clearer to dwell during its stroke with opportunity to settle down back of a tack, for the purpose described.

6. In a tack supplying mechanism, a rotatable clearer shaft, a pivotally movable hopper having a cam face and a connection between the shaft and the cam face comprising a ratchet disk on the shaft, a pawl carrier movable in one direction by the cam face, a thrust pawl yieldingly mounted in the carrier to turn the ratchet during such movement, a pulling pawl mounted on the carrier, and a spring effecting return movement of the carrier and thereby actuating the last mentioned pawl.

7. A tack supply mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied by the hopper, means for intermittently turning the hopper, a clearer shaft, a series of clearers arranged about the shaft for successive coöperation with the chute and each slidingly mounted thereon, and a driving connection from the hopper to the shaft arranged to permit a brief dwell in the movement of the shaft after the clearer has engaged the chute and before it leaves the chute.

8. A tack supply mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied by the hopper, means for intermittently turning the hopper, a clearer shaft, a series of clearers arranged about the shaft for successive coöperation with the chute and each slidingly mounted thereon, and a driving connection from the hopper to the clearer shaft including a reciprocatory slide and arranged to advance the clearer yieldingly through a part of its operative stroke while the slide advances and to advance the clearer yieldingly through another part of its stroke while the slide returns whereby a dwell is provided in the stroke of the clearer.

9. A tack supplying mechanism having, in combination, a hopper, a chute arranged to receive tacks from the hopper, and means for clearing tacks from the upper end of the chute, said means comprising a carrier, clearer plates slidingly mounted on the carrier, and means for actuating the carrier to bring the clearer plates successively into wiping contact with the chute.

10. In a machine of the class described, a hopper, a chute to receive tacks from the hopper, means for clearing tacks from the throat of the chute, said means comprising a rotary carrier, an annular series of clearer plates each of which is slidingly mounted on said carrier, and means for actuating the carrier to bring the plates successively into wiping contact with the chute for dislodging tacks from the throat of the chute.

11. In a machine of the class described, a hopper, a chute to receive tacks from the hopper, means for clearing tacks from the throat of the chute, said means comprising a carrier, clearer plates slidingly mounted on said carrier, means for actuating the carrier to bring the plates successively into wiping contact with the chute for dislodging tacks from the throat of the chute, and means for manually actuating the tack clearing means.

12. In a machine of the class described, a hopper, a chute to receive tacks from the

hopper, means for clearing tacks from the throat of the chute, said means comprising a carrier, a plurality of clearer plates slidingly mounted thereon, stops for limiting the movement of said sliding plates, and means to actuate said carrier for bringing the plates successively into position to rest by gravity upon the chute and for moving said plates along said chute to dislodge tacks therefrom.

13. A tack supplying mechanism having, in combination, a hopper, a chute arranged to receive tacks from the hopper, and means for clearing tacks from the upper end of the chute, said means comprising a carrier, means for turning the carrier, a clearer plate mounted to slide in the carrier into operative relation to the chute as it is turned down and to slide reversely on its carrier as it is turned up away from the chute, and means for limiting the sliding movement of the plate on its carrier.

14. In a machine of the class described, a hopper, a chute to receive tacks from the hopper, means for clearing tacks from the throat of the chute comprising an annular series of relatively movable clearer plates arranged for successive coöperation with the chute, and means for actuating them.

15. A tack supplying mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied from the hopper, means for intermittently turning the hopper, a clearer for dislodging tacks from a portion of the chute, and operating connections from the oscillatory hopper to the clearer arranged to allow the clearer to come to a dwell among the tacks in the chute in position preparatory to dislodging tacks and thereafter to impart to the clearer a quick movement for throwing off tacks.

16. A tack supplying mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied from the hopper, means for intermittently turning the hopper, a clearer for dislodging tacks from a portion of the chute, and operating connections from the oscillatory hopper to the clearer, said parts being arranged to be so positioned that the clearer shall dwell among the tacks in the chute between oscillatory movements of the hopper and receive a quick movement for throwing off tacks after the hopper begins to move.

17. A tack supplying mechanism having, in combination, an oscillatory hopper, a chute to which tacks are supplied from the hopper, means for intermittently turning the hopper, a series of clearers arranged to engage the chute successively for dislodging tacks, operating connections from the oscillatory hopper to the clearers arranged to permit a clearer to dwell among the tacks on the chute between oscillatory movements of the hopper and to cause that clearer to have a quick movement to throw off tacks when the hopper is started, said machine having provision for causing a pause in the movement of the clearers before the next clearer comes into position to obstruct the passage of tacks along the chute.

18. A machine of the class described having, in combination, a tack hopper, a cam shaft which has an intermittent rotatory movement, and connections between the shaft and the hopper constructed and arranged to store up energy during the movement of the shaft for turning the hopper as and for the purpose described after the shaft comes to rest, a tack clearer mechanism, and connections driven by movement of the hopper for actuating the clearer mechanism, said last-mentioned connections serving to retard the movement of the hopper and extend its operation beyond the period of actuation of the cam shaft.

19. A machine of the class described having, in combination, a tack hopper, a cam shaft which has an intermittent rotatory movement, and connections between the shaft and the hopper constructed and arranged to store up energy during the movement of the shaft for turning the hopper as and for the purpose described after the shaft comes to rest, and means independent of the cam shaft for retarding the speed at which the hopper is turned.

20. A machine of the class described having, in combination, a tack hopper, a cam shaft which has an intermittent rotatory movement, and connections between the shaft and the hopper comprising a reciprocating plate, a bar having ears, and a connection which is capable of yieldingly actuating the bar endwise in both directions and comprises a rod extending through one ear on the bar and having an upper reduced portion, a sleeve carried thereon and flanged to confine it above the ear, a spring between the ears, and a long upper sleeve that is flanged at its lower end and extends upwardly through the second ear on the bar and is confined on the rod, said parts being arranged to operate substantially as described.

21. A machine of the class described having, in combination, a tack hopper mounted for substantially complete rotation first in one direction and then in the reverse direction, a cam shaft which has an intermittent rotatory movement, and connections between the shaft and the hopper constructed and arranged to store up energy during the movement of the shaft for turning the hopper as and for the purpose described after the shaft comes to rest.

22. A machine of the class described having, in combination, a rotatable carrier having a plurality of intersecting guide faces on its perimeter, and clearer plates confined to

slide on said guide faces in directions transverse to the axis of the carrier as the carrier is rotated, one of the plates having a pin and slot connection with the carrier to limit its sliding movement and the other plates having a shoulder and lug stop connection with the carrier to limit their sliding movements outwardly and being arranged to abut against the next following plate to limit their inward sliding movement.

23. A machine of the class described having, in combination, a tack chute, a carrier, a clearer plate mounted to project from the carrier and means for actuating the carrier to move the clearer plate upwardly along the chute in wiping contact therewith in a path substantially parallel with the chute, said parts being constructed and arranged to maintain the clearer plate out of contact with the tacks in the chute during its return movement for again wiping upwardly along the chute.

24. A machine of the class described having, in combination, a tack chute, a rotary carrier, a clearer plate mounted to project from the carrier and to have a limited sliding movement in and out in a plane of non-intersection with the axis of the carrier, and means for actuating the carrier to bring the clearer plate intermittently into wiping contact with the chute.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RONALD F. McFEELY.

Witnesses:

CHARLES H. HOYT,

BARTHOLOMEW T. McDONOUGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."