C. C. SMALL, DEC'D.

J. M. SMALL, ADMINISTRATRIX.

HEEL ARRANGING MECHANISM.

APPLICATION FILED SEPT. 16, 1918.

1,386,659.

Patented Aug. 9, 1921.

3 SHEETS—SHEET 1.

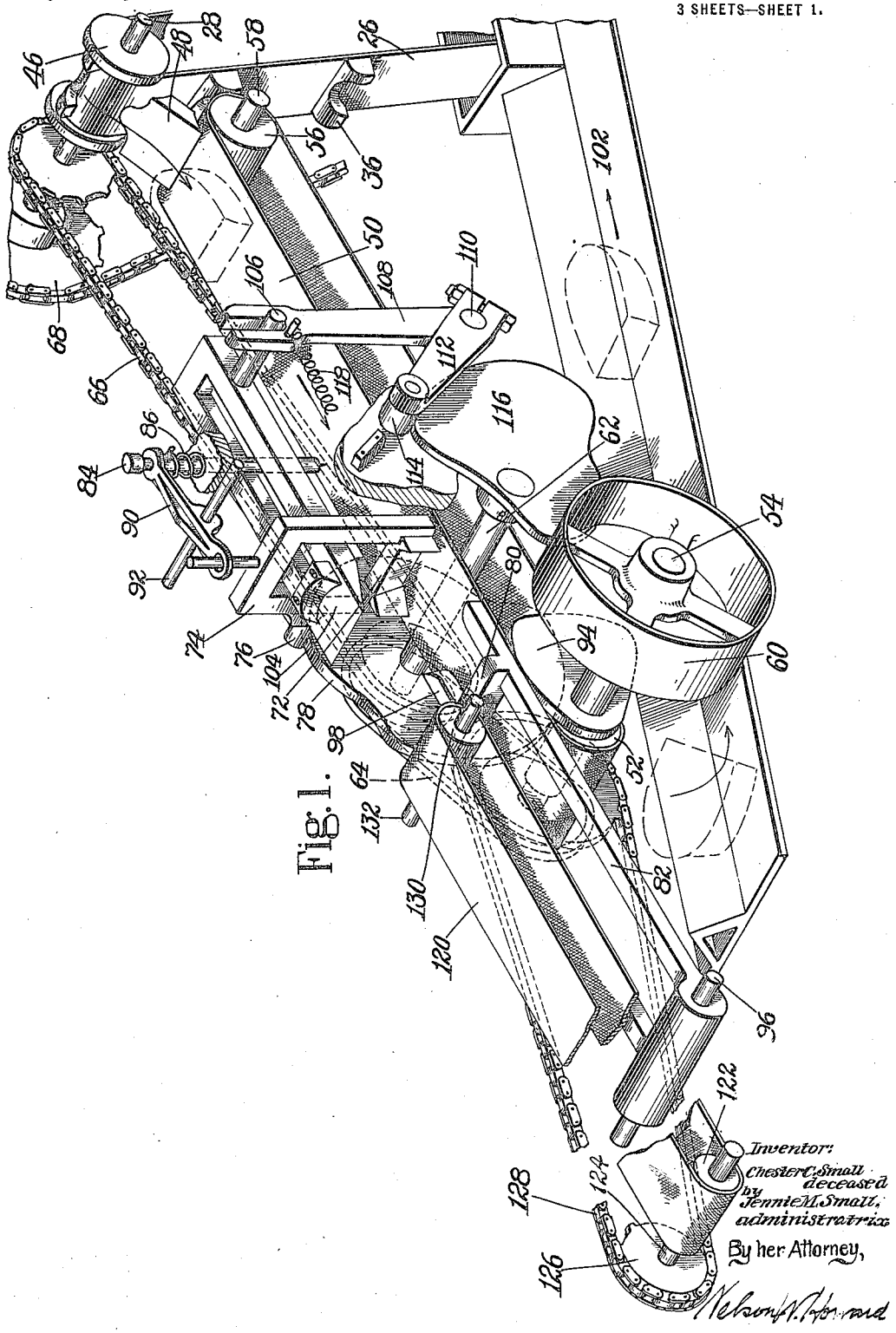


Fig. 1.

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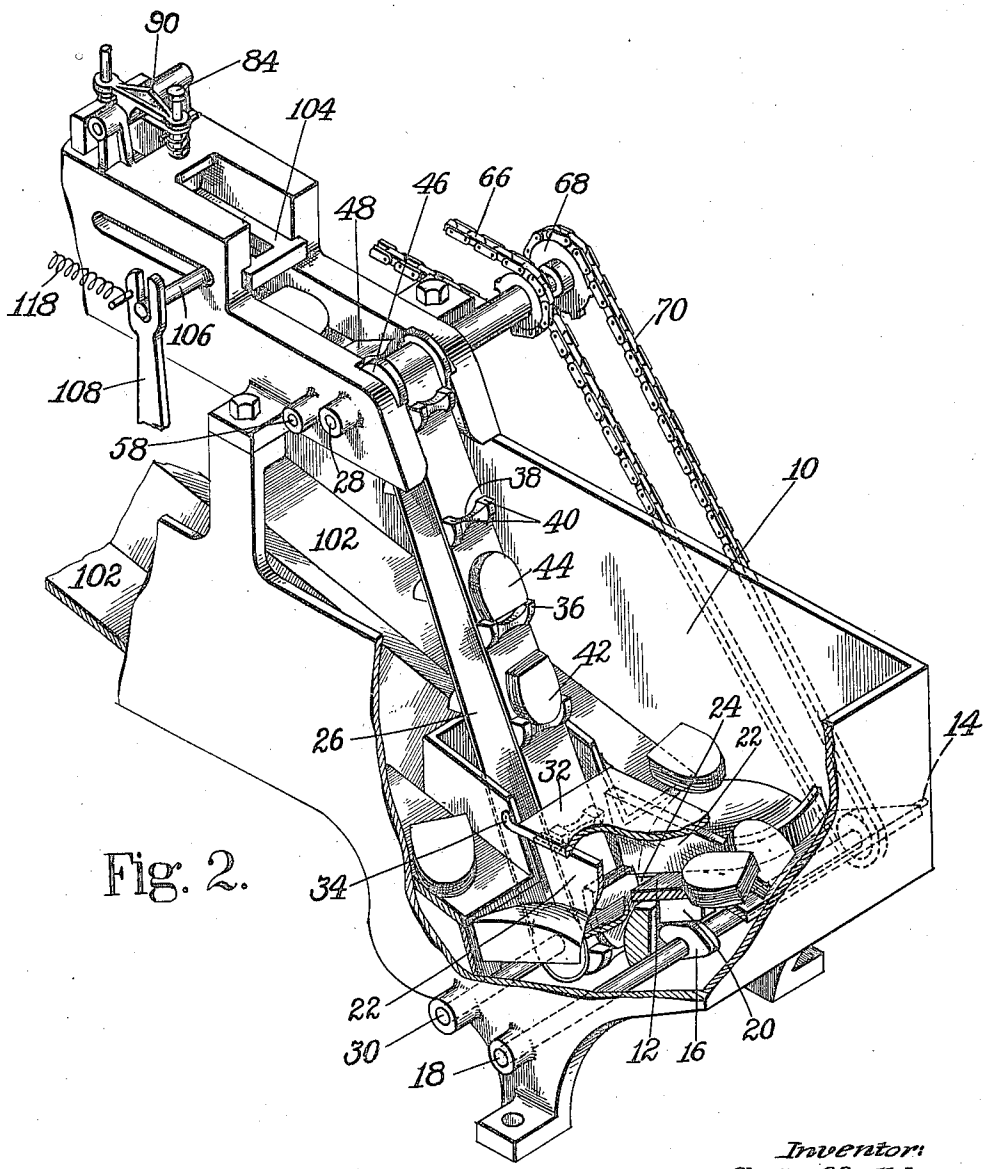


Fig. 2.

Inventor:
Chester C. Small, deceased,
By Jennie M. Small, administratrix
By her Attorney,
Nelson A. Howard

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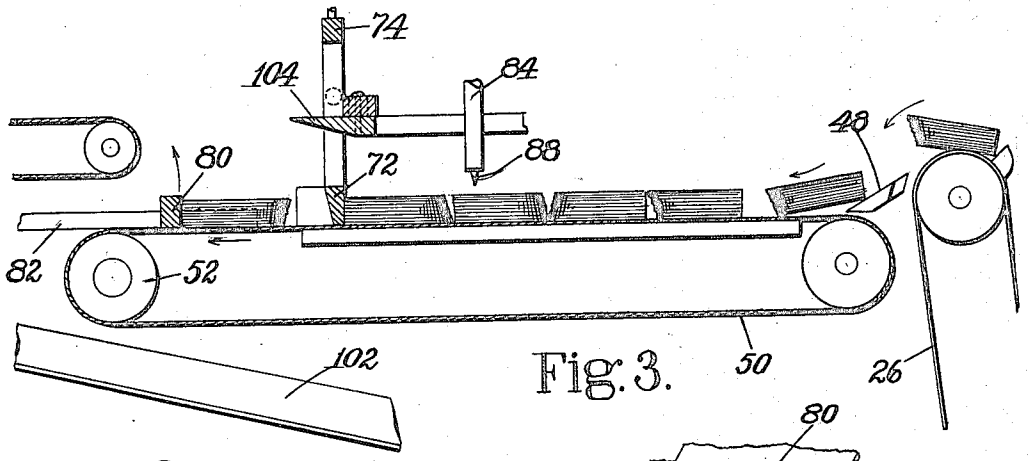


Fig. 3.

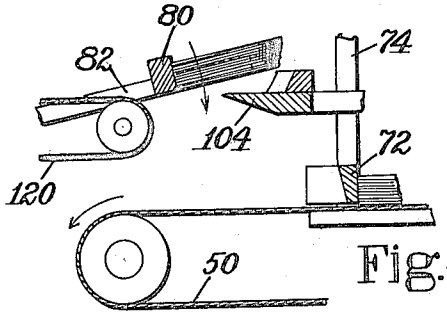


Fig. 4.

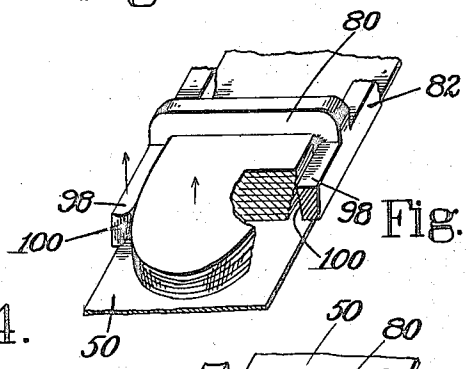


Fig. 7.

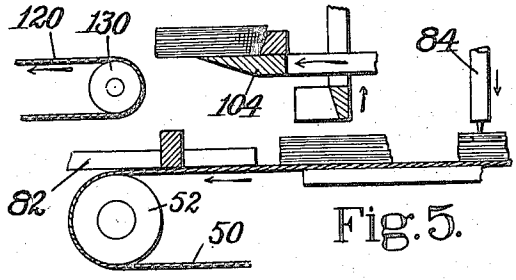


Fig. 5.

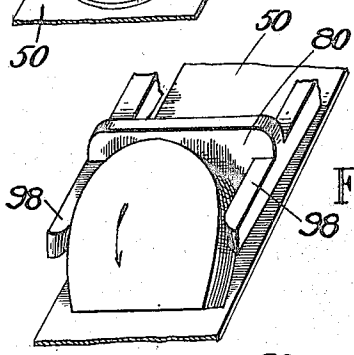


Fig. 8.

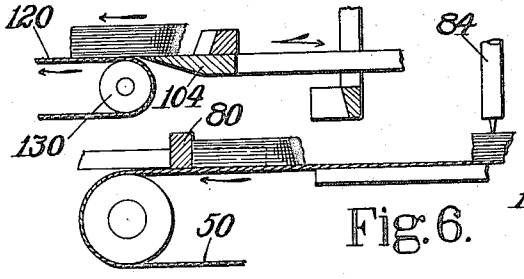


Fig. 6.

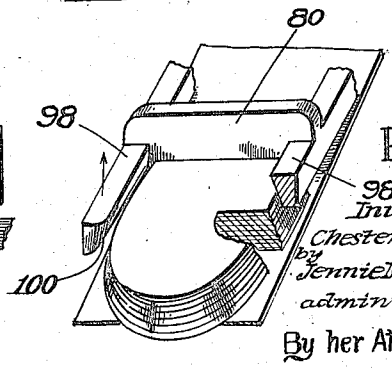


Fig. 9.

Inventor:
Chester C. Small
deceased
by Jennie M. Small
administratrix:
By her Attorney,
Nelson Mahoney

UNITED STATES PATENT OFFICE.

CHESTER C. SMALL, DECEASED, LATE OF NEWTON HIGHLANDS, MASSACHUSETTS, BY JENNIE M. SMALL, ADMINISTRATRIX, OF NEWTON HIGHLANDS, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HEEL-ARRANGING MECHANISM.

1,386,659. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed September 16, 1918. Serial No. 254,288.

To all whom it may concern:

Be it known that CHESTER C. SMALL, deceased, late of Newton Highlands, in the county of Middlesex and State of Massachusetts, invented certain Improvements in Heel-Arranging 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 heel arranging mechanisms and, particularly, to a machine or mechanism capable of receiving heels in a miscellaneous or indiscriminate mass and assorting and presenting them in orderly arrangement.

Manufactured heel blanks are usually stored in bins, boxes, or barrels, and when it is desired to present them to a heel compressor or other machine which is to operate upon them, they are removed from such receptacles and presented by hand to the machine. This element of hand labor not only introduces a substantial item of expense into the operation to be performed, but also limits the productiveness of the machine to the speed of the individual operator.

It has been proposed, heretofore, to provide machines for operating upon heels with magazines constructed to hold a stack of heel blanks which would be fed automatically from the stack to the operating mechanism of the machine. Some such machines have, indeed, been built but, inasmuch as the magazines had to be loaded with blanks by hand, it has been found as a rule that a single operator could not care for more than one machine, and the expected advantage has not been gained.

The object of the present invention is to provide automatic mechanism to which heels may be supplied indiscriminately in bulk and which will operate to arrange the heels in uniform and orderly array, and, if desired, present them automatically to a machine which is to operate upon them or, alternatively, deliver them to a magazine in which they may be stored, or which may be placed upon an operating machine in cooperative relation to the feeding mechanism thereof. With this object in view, an important feature of the invention resides in the provision of mechanism for receiving heels presented indiscriminately and arranging them with a corresponding element—for example, the longitudinal axis—similarly disposed. By the employment of this principle one is enabled to separate heels from a confused mass and arrange and place them in orderly array. It is believed to be new in the art to handle heel blanks mechanically in this way, and it is intended to claim this feature of the invention broadly.

In this connection, a further feature of the invention resides in the provision of means for removing heels, one by one, from a mass of blanks contained in a hopper or other receptacle, separating and rejecting those heels which are not arranged as desired, and advancing the properly arranged heels all the same side up and with the same end foremost; that is, all pointing or facing in the same direction. Preferably, the rejected heels are returned to the hopper and again acted upon, this operation being repeated until they are received in the proper position to be advanced.

As a feature of the mechanism for selecting the properly presented heels and segregating them from those which are improperly presented, means is provided for balancing each heel in transit, the heels which point the wrong way overbalanging and returning to the hopper, while those which face properly continue on their way. The balancing device may, furthermore, be so constructed that heels which are wrong side up will fall away from it and return to the supply hopper.

The features above enumerated may advantageously be combined with endless belt conveyers acting to remove the heels from the mass, present them to the selecting devices and advance those which are properly arranged to a point where they are to be operated upon.

These and other features of the invention will best be understood and appreciated by reading the following description of one simple embodiment of the invention in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of the machine showing the means for re-

ceiving and assorting heels removed from mass;

Fig. 2 is likewise a perspective view showing the opposite end of the machine and particularly the hopper for receiving the heels and the elevator for removing them one at a time;

Figs. 3, 4, 5 and 6 are diagrammatic views illustrating successive steps in the operation of the mechanism in transferring a properly positioned heel from the conveying to the delivery belt; and

Figs. 7, 8 and 9 are perspective views of the selecting device illustrating its operation upon variously positioned heels.

Referring now to the drawings, 10 indicates a receptacle or hopper into which heels may be poured indiscriminately. The bottom 12 of the hopper is loosely pivoted at 14 and the cam 16, mounted upon a rotating shaft 18, engages a block 20 secured to the under side of the bottom of the hopper, continually agitating the bottom of the hopper and the mass of heels resting thereon. Guides 22 are so placed within the hopper that the heels are permitted to gravitate one at a time toward a space 24, where one heel at a time may fall into flat engagement with an elevator belt 26 which is continuously driven by a shaft 28 and maintained taut by an idle shaft 30. A cover plate 32, hinged at 34, normally covers the space adjacent to the elevator 26, preventing the accumulation of a mass of heels against the elevator. This cover plate may be readily lifted to afford access to the space beneath when it is desired to clear the hopper of heels.

Mounted upon the elevator 26 is a series of lifters 36 preferably hollowed out as shown at 38 and provided with flat abutment portions 40. The shape of these lifters is such that one of them will engage and lift a heel resting flat against the elevator belt 26 and arranged with its axis longitudinally thereof. If the heel happens to be disposed with its curved end downward, that end will engage and be supported by the curved portion 38 of the lifter, as shown at 42 in Fig. 2; if the heel be disposed breast downward, its breast end will be engaged by the flat abutment portions 40 and the heel will be lifted in the position shown at 44. If the heel should not lie flat against the belt 26 it will not be lifted from the hopper at all, and the spacing and arrangement of the guides 22 is such that the heel is not permitted to reach the belt lying crosswise thereof. It will thus be apparent that the first step in the operation of the machine consists in separating single heels from the mass and arranging them longitudinally of the elevator without regard to which side up they may be or which way they may point or face.

As the motion of the elevator continues, the heels are successively carried up over a drum 46 upon the shaft 28 which guides and drives the elevator belt. As a heel passes over the drum it slides down an incline 48, Fig. 1, and is deposited upon an endless belt conveyer 50, which runs continuously, being driven by a drum 52 upon the main driving shaft 54 of the machine and being maintained taut by a drum 56 upon an idle shaft 58. The driving shaft 54 also carries a pulley 60 which may receive power from any convenient source.

The shaft 54 drives a counter shaft 62 through a sprocket chain 64, and the counter shaft 62 in turn drives the elevator shaft 28 through a sprocket chain 66. A sprocket wheel 68, secured upon the end of the shaft 28, is connected by a chain 70 to a sprocket upon the end of the shaft 18, thus rotating the said shaft to agitate the mass of heels in the hopper. The various elements of the power transmission just described are preferably so proportioned that the conveyer 50 moves at a greater speed than the elevator 26, the purpose being to insure against heels piling up at the bottom of the incline 48.

Referring now to Fig. 3, as the line of the heels upon the conveyer advances toward the left, the foremost heel engages a stop bar 72 which stops the advancing movement of that heel and those behind it, although the conveyer belt continues to move. The stop bar 72 is carried by a vertically movable frame 74, provided with a cam roll 76, operated upon by a cam 78 fixed upon the counter shaft 62. As the counter shaft rotates, the cam 78 lifts the stop bar 72, permitting the foremost heel to be advanced until it engages an abutment 80 forming a portion of a balancing and selecting device 82.

Simultaneously with the elevation of the stop bar 72, a vertically movable plunger 84, normally elevated by a spring 86, and having a sharpened point 88 at its lower end, is depressed by a lever 90, which is pivoted at 92 and operated against the tension of the spring 86 by the engagement with the opposite end of the lever of the upper end of the frame 74. It will be apparent that the construction just described acts, in effect, as an escapement, permitting the foremost heel in the row back of the stop 72 to be advanced into engagement with the abutment 80, but holding the next heel and those following it against forward movement. The stop 72 is again immediately lowered, the plunger 84 being simultaneously raised by the spring 86, and the line of heels being advanced by the conveyer 50. Fig. 3 illustrates the condition at this time.

A cam 94 upon the driving shaft 54 now operates to lift the balancing and selecting device 82, which is pivoted at 96, to the position shown in Fig. 3. The selecting device is provided with projecting jaws 98, the heel

engaging faces of which are undercut, as shown at 100, see Fig. 7. These jaws are so spaced and shaped relatively to the width and taper of the heel being handled that the selecting device will support and lift only those heels which are presented to it with the larger face, that is to say, the base lift, upward. This condition is illustrated in Fig. 7. Fig. 9 shows the condition when the heel reaches the selecting device with its small face, that is, the top lift, uppermost. In this event, the taper of the heel and of the space between the jaws 98 is in the same direction and the selecting device will not support and lift the heel, which is advanced by the conveyer 50 until it passes over the drum 52 and falls into a chute 102, by which the heel is conducted back into the hopper 10 where it joins the mass of heels and eventually is again picked up by the elevator. The length of the jaws 98, projecting from the abutment 80, is such relatively to the length of the heel being handled that if a heel reach the device curved end foremost, the weight of the breast end of the heel, which contains more material than the rear end, will cause the heel to overbalance and fall out of the jaws even though the heel may be right side up. This condition is illustrated in Fig. 8, and a heel which is thus overbalanced and falls out of the jaws is deposited upon the conveyer 50 and dropped into the chute 102, by which it is returned to the hopper, as already described.

It will be apparent that the balancing device 82 performs the second important step in the operation of the machine, namely, to select from the previously longitudinally arranged heels only those which point or face in the same direction and are the same side up, separating and rejecting the remainder and permitting them to be returned to the hopper.

When a heel has been lifted by the balancing device into the position shown in Fig. 4, a carrier 104 advances to the position shown in the said figure to receive the heel. The carrier 104 is mounted for horizontal sliding movement and is connected by a laterally projecting pin 106 to one arm 108 of a bell crank lever pivoted at 110 to the machine frame. The second arm 112 of the lever carries a cam roll 114 which engages a cam 116 mounted upon the counter shaft 62, the roll being held to the cam by a spring 118. The cam 116 is so timed relatively to the cam 94 that the carrier 104 is advanced to a position beneath the heel immediately after the heel has been lifted by the balancing device 82. The balancing device then descends to its former position, leaving the heel upon the carrier, as shown in Fig. 5. The cam 116 is so formed that the carrier 104 is now advanced to deposit the heel upon a delivery belt 120, as shown in Fig. 6. The belt 120 is driven by a drum 122 upon a shaft 124, which carries a sprocket wheel 126 connected by a chain 128 to a driving sprocket upon the shaft 54, and the belt 120 is maintained taut by a drum 130 upon an idle shaft 132. The gearing between the shaft 54 and the shaft 124 is preferably so proportioned that the delivery belt 120 moves faster than the conveyer belt 50 to insure against the possibility of any piling up of heels at the beginning of the delivery belt.

The delivery belt may be arranged to conduct the heels to any desired point such, for example, as to a machine which is to operate upon the heels, or to a stacking device for inserting them into a magazine or the like.

While the figures of the drawings show diagrammatically the successive steps of a single cycle of the operation of the machine, and only a single cycle of such operation has been described in detail, it is to be understood that the operation is a continuous one, the operating parts being in proper timed relation to each other to cause them to continue to assort and arrange successive heels as long as the machine is kept running and heels are supplied to the hopper.

It should be understood also that while a simple illustrative embodiment of the invention is disclosed and described herein, the invention itself is a generic one and may be embodied in a large variety of constructive forms, and the claims appended hereto are not intended to be limited to the specific construction shown but are to be construed broadly.

The terms "heel" and "heel blank" are, for convenience, used throughout this specification and the following claims to denote the article being handled. It should be clearly understood, however, that these terms are not to be construed specifically as defining a complete or finished heel but are intended to designate broadly either a complete heel or a heel section, lift, or blank which may be assembled with other sections, lifts or blanks to form a complete heel.

Having described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:—

1. A heel arranging mechanism comprising means for separating heels from an indiscriminate mass, and means for disposing them in orderly arrangement.

2. A heel arranging mechanism comprising means for imparting movement to heels in an indiscriminate mass, and means for disposing them in orderly arrangement.

3. A heel arranging mechanism comprising, in combination, means for receiving a mass of heels in indiscriminate arrangement, and means for separating and removing heels from the mass one at a time.

4. A heel arranging mechanism comprising, in combination, means for presenting

heels in indiscriminate arrangement, and means for separating heels from those presented and disposing them in orderly arrangement with respect to one of their elements.

5. A heel arranging mechanism comprising, in combination, means for presenting heels indiscriminately, and means for disposing the heels in orderly arrangement with respect to one of their elements.

6. A heel arranging mechanism comprising, in combination, means for presenting heels indiscriminately, and means for arranging the heels with a corresponding element of each similarly disposed.

7. A heel arranging mechanism comprising, in combination, means for presenting heels indiscriminately, and means for arranging the heels with their longitudinal axes all in the same direction.

8. A heel arranging mechanism comprising, in combination, means for receiving heels either side up indiscriminately, and means for delivering therefrom heels with the same side up.

9. A heel arranging mechanism comprising, in combination, means for receiving heels breast foremost and curved end foremost indiscriminately, and means for delivering therefrom heels with the same end foremost.

10. A heel arranging mechanism comprising means for receiving heels presented either end foremost indiscriminately and selecting therefrom heels with the same end foremost, and means for presenting heels to said mechanism.

11. A heel arranging mechanism comprising, in combination, means for presenting heels indiscriminately, and means for delivering the heels all with the same side up and the same end foremost.

12. A heel arranging mechanism comprising, in combination, means for receiving heels presented indiscriminately, means for removing the heels from the receiving point, and means for selecting from the heels thus removed those that are positioned in a predetermined way and rejecting the remainder.

13. A heel arranging mechanism comprising, in combination, means for removing heels from an indiscriminate mass, and means for selecting from the heels thus removed those positioned in a predetermined way and returning the remainder to the mass.

14. A heel arranging mechanism comprising, in combination, means for receiving heels in an indiscriminate mass, means for delivering heels from the mass successively with their longitudinal axes all arranged in the same direction, and means for selecting from the heels thus delivered all those with the same side up and the same end foremost.

15. A heel arranging mechanism comprising, in combination, means for receiving heels in an indiscriminate mass, means for delivering heels from the mass successively with their longitudinal axes all arranged in the same direction, and means for selecting from the heels thus delivered all those with the same side up and the same end foremost, and returning the remaining heels to the mass.

16. A heel arranging mechanism comprising, in combination, a receptacle for a mass of heels indiscriminately arranged, means for delivering heels one at a time in the direction of their longitudinal axes, and means for selecting and separating from the heels thus delivered all those positioned in a predetermined way.

17. A heel arranging mechanism comprising, in combination, a hopper for an indiscriminately arranged mass of heels, means for removing heels successively from the hopper, and means for insuring presentation of heels from the mass to the removing means with a corresponding element of each heel similarly disposed.

18. A heel arranging mechanism comprising, in combination, a hopper for an indiscriminately arranged mass of heels, means for removing heels successively from the hopper, and means for insuring presentation of heels from the mass to the removing means so that they shall be removed in the direction of their longitudinal axes.

19. A heel arranging mechanism comprising, in combination, means for receiving heels presented indiscriminately and arranging them with their longitudinal axes all in the same direction, and means for selecting therefrom heels of which the top lift faces otherwise than in a predetermined direction.

20. A heel arranging mechanism comprising, in combination, means for receiving heels presented indiscriminately and arranging them with their longitudinal axes all in the same direction, and means for selecting therefrom heels of which the top lift faces otherwise than downward.

21. A heel arranging mechanism comprising a selecting device constructed and arranged to select only those heels which are presented to it with the top lift facing in a predetermined direction, and means for presenting heels to said device.

22. A heel arranging mechanism comprising, in combination, a selecting device constructed and arranged to select only those heels which are presented to it with the top lift facing in a predetermined direction, and means for presenting heels to said device with their top lifts facing in different directions indiscriminately.

23. A heel arranging mechanism comprising a selecting device constructed and arranged to select only those heels which are presented to it with the larger face upward,

and means for presenting heels to said device.

24. A heel arranging mechanism comprising, in combination, a selecting device constructed and arranged to select only those heels which are presented to it with the larger face upward, and means for presenting heels to said device either side up indiscriminately.

25. A heel arranging mechanism comprising a selecting device having jaws for engaging the sides of the heel, said jaws having inclined heel engaging faces and being formed to support heels presented to the jaws with their sides inclined oppositely to said faces.

26. A heel arranging mechanism comprising a selecting device presenting a heel receiving space tapering in one direction and constructed and arranged to support heels tapering in the opposite direction.

27. A heel arranging mechanism comprising a selecting device presenting a tapering heel receiving space.

28. A heel arranging mechanism comprising a selecting device presenting an upwardly tapering heel receiving space.

29. A heel arranging mechanism comprising a selecting device provided with means for balancing heels presented either end foremost indiscriminately and retaining only those presented with the heavier end foremost.

30. A heel arranging mechanism comprising a balancing device provided with an abutment, and jaws for engaging opposite sides of a heel projecting from the abutment, the parts being so proportioned relatively to the heels being handled that a heel placed between the jaws with its heavier end against the abutment will be supported and a heel similarly placed with its lighter end against the abutment will overbalance and drop away from the device.

31. A heel arranging mechanism comprising, in combination, a hopper constructed to receive heels in miscellaneous or indiscriminate arrangement, an elevator coöperatively related to the hopper to remove heels therefrom, means in the hopper for insuring the presentation of heels one at a time to the elevator, a heel balancing and selecting device, and conveying mechanism connecting the elevator and the balancing device.

32. A mechanism for handling heels including a plurality of serially arranged heel transferring devices, one of said devices being operated at a higher speed than the one preceding, whereby accumulation of heels at the point of delivery from one device to the next is prevented, and means for operating upon the heels during the period of such delivery.

33. A mechanism for handling heels comprising a plurality of serially arranged, continuously running belts, each of said belts being operated at a higher speed than the one preceding, whereby accumulation of heels at the point of delivery from one belt to the next is prevented, and means for operating upon the heels during the period of such delivery.

34. A heel arranging mechanism comprising a movable elevator provided with a lifter constructed and arranged to engage and lift only heels presented to it with their longitudinal axes disposed in its direction of movement.

35. A heel arranging mechanism comprising an endless belt elevator, and lifters upon the elevator constructed and arranged to engage and lift only heels resting flat against the belt with their longitudinal axes disposed in its direction of movement.

36. A heel arranging mechanism comprising, in combination, a selecting device, means for presenting heels one by one to the selecting device, means for lifting the selecting device after a heel has been presented to it, and means for removing the heel from the selecting device after the latter is lifted.

37. A heel arranging mechanism comprising, in combination, a heel balancing device constructed and arranged to select heels presented in a predetermined position, means for presenting heels in a plurality of positions to said device, means for lifting said device with a selected heel supported thereby, and means for removing the heel from the device.

38. A heel arranging mechanism comprising, in combination, a hopper for receiving heels in bulk, an elevator constructed and arranged to remove heels from the hopper with their longitudinal axes disposed in one direction, a conveyer arranged to receive the heels from the elevator, a selecting device arranged to receive the heels from the conveyer and constructed to separate from the heels those disposed in a predetermined way, and a delivery conveyer arranged to receive the selected heels and remove them.

In testimony whereof I have signed my name to this specification.

JENNIE M. SMALL,
Administratrix of the Estate of Chester C. Small, deceased.