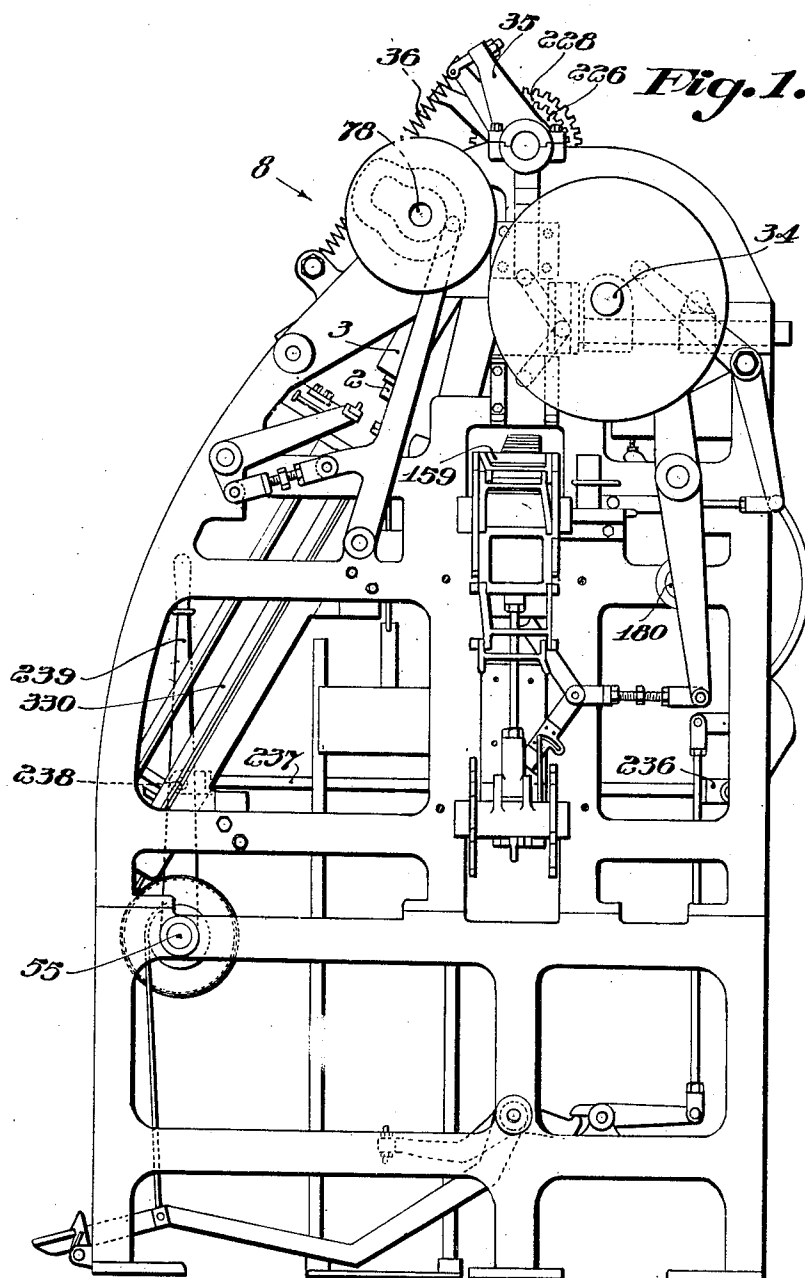


1,355,296.

E. E. WINKLEY,
APPARATUS FOR HANDLING BLANKS.
APPLICATION FILED NOV. 1, 1915. RENEWED DEC. 9, 1918.

Patented Oct. 12, 1920.
3 SHEETS—SHEET 1.



Inventor.

Eugene E. Winkley
by his attorney
Phillips, Van Horn & Allen

E. E. WINKLEY.

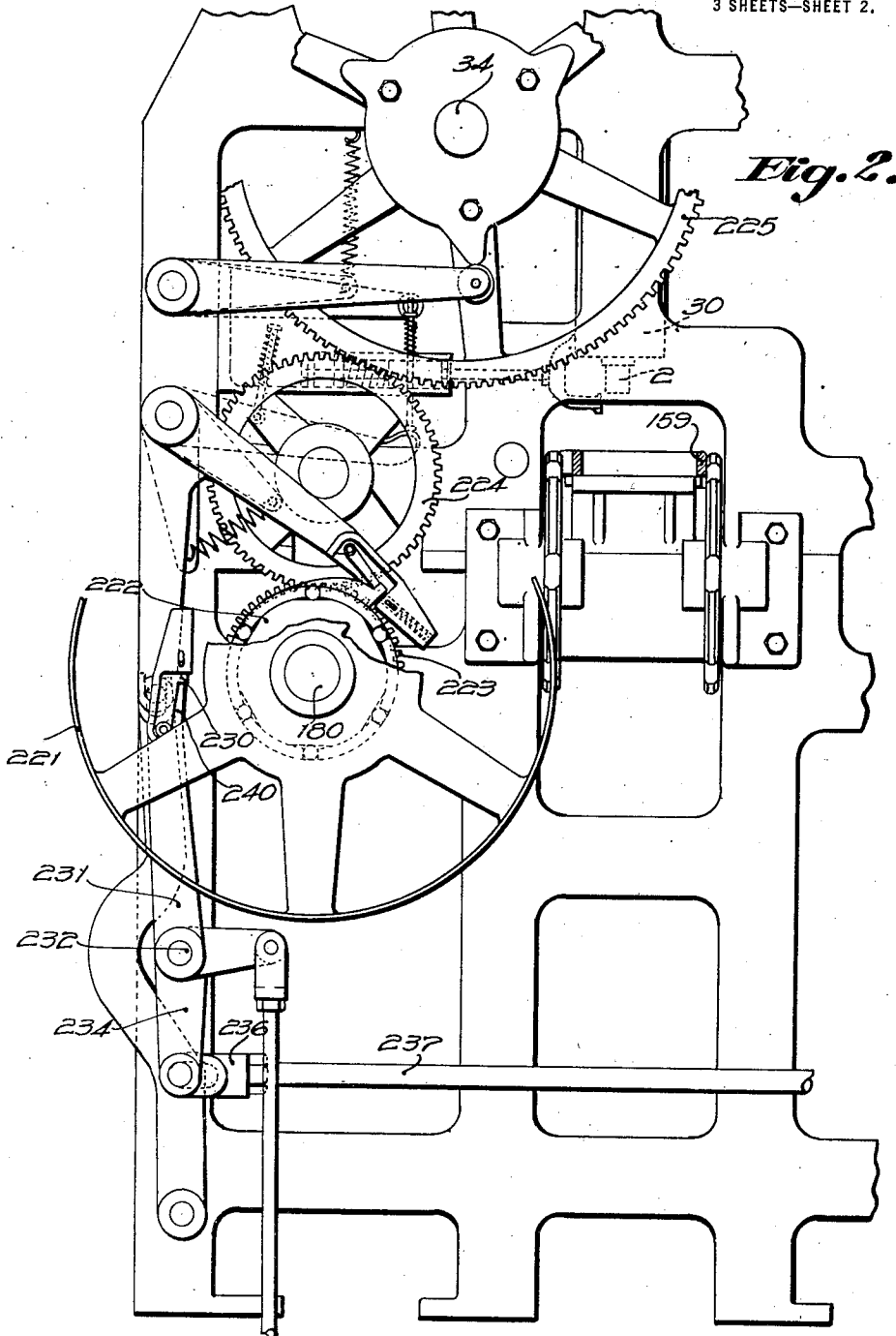
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3 SHEETS—SHEET 2.



Inventor:

E. E. Winkley
by his attorneys
Phillips, Hartman, & Cook

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3 SHEETS—SHEET 3.

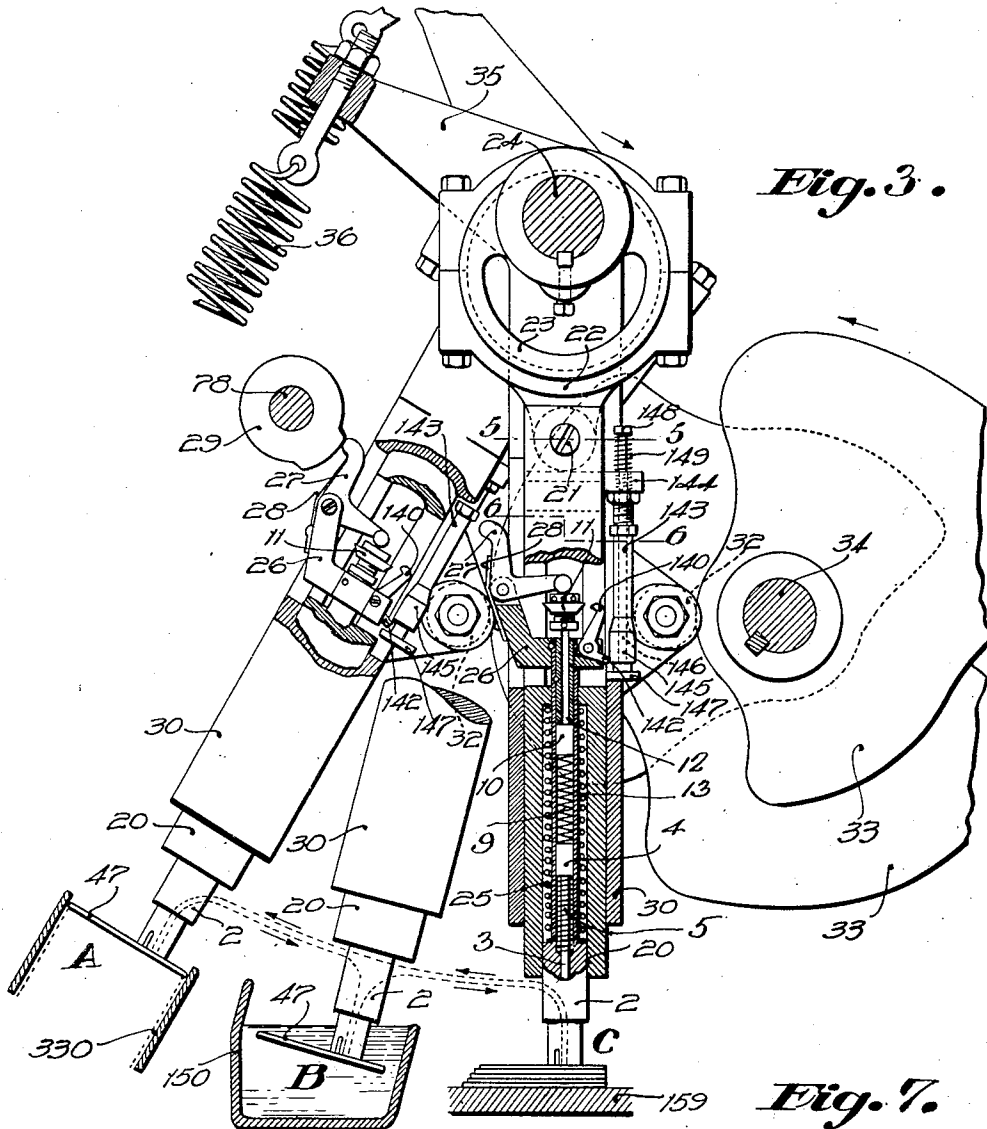


Fig. 3.

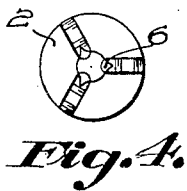


Fig. 4.

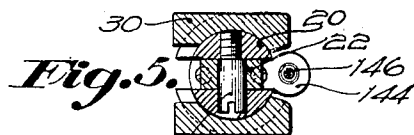


Fig. 5.

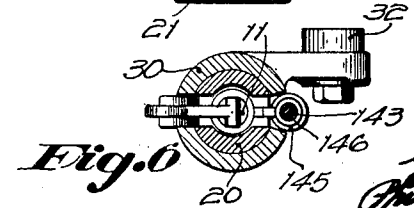


Fig. 6.

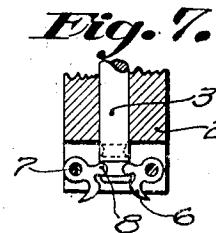


Fig. 7.

Inventor:

E. E. Winkley
by his attorney
Phillip, Newman & Co.

UNITED STATES PATENT OFFICE.

ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

APPARATUS FOR HANDLING BLANKS.

1,355,296.

Specification of Letters Patent.

Patented Oct. 12, 1920.

Original application filed August 26, 1910, Serial No. 579,109. Divided and this application filed November 1, 1915, Serial No. 59,031. Renewed December 9, 1918. Serial No. 266,018.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Handling Blanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mechanism for feeding, or transferring, or otherwise handling blanks or articles of various kinds and characteristics, and more particularly to an improved mechanism by which said blanks or articles, to be moved from one place or position to another, may be positively engaged and carried without other support. As the invention may readily be adapted to successfully handle various pieces or blanks in different arts and of different characteristics, in the following specification the term "blank" will be used as inclusive of any article or piece which the mechanism is adapted to handle.

One of the objects of the present invention is to provide a blank-handling mechanism of general utility which may be expeditiously employed with facility for handling blanks or pieces of stock of different materials, characteristics, sizes and forms, used in various arts and manufactures as may be desired, and which shall be particularly adaptable for use in cases where the blanks must be handled with firmness, reliability and rapidity, and be positively engaged and retained by the blank-handling mechanism for a period of time.

Accordingly, one feature of the invention resides in the provision of a blank-handling mechanism having a plurality of blank-impaling devices or claws which are actuated preferably yieldingly in divergent directions to engage and obliquely and expansively penetrate the surface of a blank to be handled. Having thus impaled the blank, the impaling devices are retained in operative position by suitable latching means while the mechanism is moved to transfer the impaled blank to a position of deposit, where the devices are released and withdrawn and the blank may be stripped therefrom and deposited.

The feature of the invention relating to the yielding operation of the impaling devices is of special importance in adapting the mechanism to successfully act upon blanks of different materials and density characteristics, for the reason that the impaling or penetrating action is thus enabled to accommodate itself to the particular qualities and properties of the material without subjecting the mechanism to undue stress. For instance, if the material is relatively soft and yielding, the impaling devices may be introduced therein their full length, whereas if the stock is hard and comparatively dense, the penetration of the devices is accordingly arrested when only partially inserted, the yielding element serving to take up the excess of movement of the actuating mechanism and to relieve the apparatus from undesirable strain.

The feature of the invention relating to the divergent disposition and expansive operation of the impaling devices contributes to the general utility of the blank-handling mechanism, inasmuch as the apparatus is thus adapted to work upon blanks of thin, flimsy and pliable materials which have insufficient rigidity and stability in themselves to maintain their form when operated upon by blank-handling devices of the prior art, such for example as shown and described in Patent No. 760,791, granted May 24, 1904 to Horton. In the patented structure referred to, the impaling devices are convergently introduced into relatively stiff and rigid blanks of wood. Such an arrangement of impaling devices would obviously be useless in handling material of the character under consideration, since the material would immediately bend, buckle and crumple up beyond control. For handling such material, the present invention is especially effective and reliable, for the reason that the expansively operated impaling devices penetrate the blank in substantially opposite directions, the one from the other, whereby the material is held firmly and in unaltered form between them.

Other objects of the invention and features by which they are attained will be readily understood by those skilled in the art from the following description of the preferred embodiment of the invention illustrated, as adapted for use in a heel-building

machine, in the accompanying drawings, in which:—

To the accomplishment of the above object the invention comprises the features and combinations of parts hereinafter described and particularly pointed out in the appended claims.

The accompanying drawings illustrate the preferred form of the invention as adapted for use in a heel building machine in which:

Figure 1 is a left-side elevation of a heel building machine employing the blank handling mechanism;

Fig. 2 is a partial right-side elevation of the machine of Fig. 1, on a larger scale and broken away to show the parts in a position of rest;

Fig. 3 is a side elevation, partly in section of the blank handling mechanism;

Fig. 4 is an end view, from beneath, of one of the pickers which seize the blanks;

Fig. 5 is a horizontal section on the line 6—6 of Fig. 3 of one of said pickers;

Fig. 6 is a horizontal section on the broken line 7—7 of Fig. 3; and

Fig. 7 is a central vertical section of said picker.

As illustrative of one field in which a great number of diversely shaped and differently sized blanks of various characteristics and forms are handled, the art of manufacturing shoes may be cited. In many processes in this art various pieces of stock are handled, a particular instance being the process of building heels in which pieces known as "lifts" are handled a number of times. Owing to the great number and the variety of different forms and characteristics of these several blanks to be handled in the production of a quantity of shoes, a means for facilitating the handling of blanks is a particular desideratum in the shoe making art. This application is a division of applicant's Patent No. 1,286,472 granted Dec. 3, 1918 for a heel building machine, in which the present invention is described but not claimed.

The invention comprehends a blank handling mechanism so designed that a blank is grasped with a claw-like action by a picker and impaled firmly thereon. In the form of the invention illustrated in the drawings, referring more particularly to Fig. 3, the blank handler comprises a tubular body or casing 2 in which is slidable a plunger 3 having a head 4 against which reacts an expansion spring 5. To seize or grasp a blank to be handled the casing is provided with a picker comprising a plurality of claws 6 mounted in radial slots in its lower end. These claws are mounted on pivots 7 and have radial lugs 8 entering an annular groove in the end of the plunger 3 for co-action therewith. The spring 5 operates normally to move the plunger 3 inwardly

and thus rock the claws 6 to withdraw their points upwardly into the slots and within the end face of the casing 2. To project the claws downwardly and outwardly and cause them to expansively impale or claw into a blank to be picked up, the plunger 3 is forced downwardly and the claws are positively rocked on their pivots 7. The claws are thus forced into the blank in divergent directions so that they act against each other. The picker is therefore rendered very effective and reliable in firmly gripping and holding the blank, and moreover is especially adapted to operate upon thin, flimsy and pliable blanks, as has already been pointed out. This downward movement of the plunger may be effected by direct pressure on the plunger but preferably the force is applied through the medium of a yieldable device to protect the claws 6 from excess pressure after they have entered a sufficient distance in the blank to be grasped. The distance to which the claws 6 penetrate the blank depends upon the nature and density of the material, it being apparent that if the material be sufficiently soft and yielding the claws may be introduced their full length. Accordingly, if the character of the material is hard and dense, the degree of insertion of the claws is relatively restricted and the yieldable device functions to relieve the mechanism from excessive strain. This device consists of a compression spring 9 of greater strength than the spring 5 which is interposed between the plunger head 4 and an upper claw actuating plunger 10 having a stem 12 slidably mounted in and projecting through the upper end of the casing 2. This plunger 10 carries an adjustable operating head 11. The spring 9 when expanded maintains the member 10 in outer position without compressing the spring 5. In operation, pressure is applied to the projecting head 11 of the plunger 10, thence to the stiff spring 9 and by it to the plunger or claw expander 3, which moves downward and compresses the lighter spring 5. This movement rocks the claws and forces them into the material of the blank against which the lower end of the blank handler has been placed. Upon release of pressure on the plunger 10 the interposed spring 9 expands permitting the spring 5 to expand and withdraw the claws out of the blank.

An important feature of the invention relates to the construction and arrangement of the blank impaling claws which provides for a sure retention of the blank while being transferred. To this end the claws are so designed as to exert a coöperative wedge action as they penetrate the blank acting to draw the blank toward the bottom face of the blank handler. It will be observed, see Fig. 8, that each claw 6 is formed

with eccentric outer and inner curved edges converging to a sharp point, the outer edge being on an arc described about the pivot 7 as a center. With this construction each 5 claw widens or increases in thickness rearwardly from its point, and, since the claw is forced into the blank by a turning movement about the pivot in extension of its length, the blank is necessarily drawn upwardly with increasing force as the penetration increases in depth. The degree of the 10 penetration depends on the hardness or density of the blank since the claws are advanced through a yielding medium.

15 The blank handling mechanism is shown in Figs. 1 and 3 as arranged for automatically transferring heel lifts, illustrative of one kind of blank which the transferring mechanism is adapted to handle, from one of a 20 series of stacks in a container 330 to a suitable support 159 in the process of automatically building a heel by the machine illustrated in applicant's prior patent above referred to and of which only that portion 25 will be described herein that relates to the automatic blank transferring mechanism. It is sufficient to state, therefore, that the lifts are stacked in a plurality of magazines 330 for each of which there is provided a blank handler of which three are 30 here shown in Fig. 3, one at each station or stop, A, B and C as described in said prior patent.

The hopper or container 330 may be of 35 any desired construction and arrangement.

In the illustrative machine in which the blank handler of the present invention is adapted for operation, each picker casing 2 is mounted in a slide 20 which is pivotally 40 connected by a pin 21, near its upper end, Fig. 3, with an eccentric strap 22 operated by an eccentric 23 secured on a shaft 24 journaled at the top of the machine. The upper portion of the casing 2 is reduced in size to 45 form a stem 13 which slides in a bearing at the upper end of the slide 20. The stem 13 is surrounded by a compression spring 25 bearing at each end on shoulders formed on the casing and the slide. The spring 25 50 operates to yieldably hold the casing 2 in its lowermost position, it being obvious that the spring will yield and the casing will recede within the slide 20 when a blank is engaged. Pivoted on the bracket 26 carried 55 by the casing stem 13 is a cam-lever 27 which is thrown by a spring 28 so that one of its arms rests continually on the upwardly projecting end of the head 11 of the claw actuating plunger 10. The other or 60 upwardly projecting arm of the lever 27 is adapted to engage and be actuated by a cam 29 secured on a cam shaft 78.

After the blank handler is given the desired movement toward and engages a blank 65 and then removes it from the container, the

blank is transferred by a suitable movement of the blank handler from one station, as A, Fig. 3 to another or others, as B and C, and this movement is effected by any suitable means, according to the disposition to be 70 made of the blank. In the illustrated arrangement the casing and its slide 20 are mounted in a blank handler carrier 30 loosely pivoted upon the shaft 24. Three 75 carriers are shown in the illustrative machine and in order to actuate them they are severally provided with lugs upon which are journaled cam rolls 32, each adapted to engage one of a series of similar cams 33. 80 The cams are fixed upon and rotated by a cam shaft 34, journaled in the frame of the machine, and are arranged in different angular positions on the shaft, uniformly spaced so as to cause the carriers to operate 85 in succession and at equal intervals of time. Each carrier 30 has an arm 35 to which one end of a tension spring 36 is connected, the other ends of the springs being connected to a rod on the machine frame and the springs act to maintain the cam rolls in 90 engagement with their respective cams 33.

The eccentric shaft 24 rotates constantly without effect upon the swinging carriers 30 and at three times the speed of the shaft 34. The eccentrics 23 operate to lower and 95 raise the slides 20 in the carriers, and by the combination of this movement and of the swinging movements imparted to the carriers by their cams 33, the blank handlers, in the illustrative machine are caused to travel 100 in the required paths of movement which are approximately indicated by the dotted lines between stations A, B and C, Fig. 3.

When one of the carriers 30 is swung to the position designated by the reference 105 letter A in Fig. 3, the corresponding cam lever 27 engages one of the cams 29 on the shaft 78, and a raised portion on said cam then swings the lever in such a direction as to cause it to depress its cooperating 110 claw actuating plunger 10 and through the plunger 3 yieldingly force the picker claws 6 downwardly and outwardly into the top blank in the container 330. This action occurs after the eccentric 23 has brought the 115 end of the respective picker casing 2 firmly into engagement with the blank illustrated.

As the claws must be retained in holding position while the blank handler is transferring the blank, and as the transferring 120 movement withdraws the cam lever 27 from engagement with its cam 29, independent means is provided for holding the plunger 10 in depressed position with the claw 6 extended until the proper time for releasing 125 the blank. To this end a latch 140 is pivoted upon the bracket 26 in position to cooperate with the plunger head 11, which is beveled at its under side so as to pass freely by the latch when moving downward. The oper- 130

ation of the latch is controlled by means connected with the picker slide 20. The slide, as shown in Figs. 3 and 5, is provided with a lug 144, to which the upper end of a rod 143 is adjustably fixed. The lower end of this rod is provided with a shoulder 145 adapted to engage an arm 142 projecting from the latch. Within a longitudinal hole in the rod 143 slides a rod 146 having at its lower end a head 147, also adapted to cooperate with the arm 142 on the latch. The rod 146 is normally held in its upper position by means of a compression spring 149 engaging a head 148 on the rod.

The operation of the latch mechanism is as follows: When the picker slide 20 is depressed by the eccentric 23, in the position A of the blank handler, and the extremity of the casing 2 engages the blank 47 (Fig. 3), the spring 25 yields, so as to permit the casing to be arrested while the slide completes its downward movement. This action results in a relative movement between the bracket 26, on which the latch is pivoted, and the latch operating rod 143, whereby the latch is swung into inoperative position, as shown in Fig. 3. At this time, however, the claw projecting cam 29 acts to depress the plunger 10 and cause the claws to impale yieldingly the blank, and also to depress the plunger head 11 into position to be subsequently engaged by the hooked extremity of the latch. During the subsequent withdrawing movement of the picker slide the cam 29 continues to hold the claws in projected position while the expanding spring 25 maintains the picker stem in engagement with the face of the blank in the position A of Fig. 3, and the resulting relative movement of the bracket 26 and the latch-controlling rod causes the head 147 of the rod 146 to engage the arm 142 and swing the latch into locking engagement with the plunger head 11. By the continued upward movement of the slide the blank handler raises the blank from the stack, while the latch acts to hold the claws in their blank impaling position during this movement, and during the subsequent blank transferring movement of the carrier 30.

After the blank handler has withdrawn the topmost blank from the stack, as above described, it next may be moved to the position B of Fig. 3, so as to immerse the blank in paste in a receptacle 150 mounted in stationary position or the blank may be transferred directly to its ultimate destination. The ultimate destination may be any location or support such as the heel support illustrated in Fig. 3, in which figure one of the blank handlers, in the position indicated by the letter C, is shown in the act of depositing a lift upon the top of a partially formed heel or pile of heel lifts on a heel support 159.

The relative movement of the slide 20 and the picker casing 2 causes the arm 142 to engage or release the latch 140 as shown in Fig. 3 and this allows the springs 5 and 9 to freely expand and disengage the claws 6 from the blank. During this disengagement, the lower end of the casing 2, against which the impaled blank is held, functions as a stripper to remove the blank from the claws as they are withdrawn. After depositing the lift as just described, the picker-slide is raised by the eccentric 23, and the carrier 30 is then swung back directly to the position A, thereby completing the cycle of operations of the blank handler.

The power by which the illustrated machine is operated is derived from a pulley 221 (Fig. 2) which is loosely mounted upon a shaft 180 and is connected with any suitable source of power. The pulley drives the shaft through a "Horton" clutch 222, the construction of which is well known and need not be particularly illustrated. The shaft 180 carries a pinion 223, meshing with an intermediate gear 224, which drives a gear 225 fixed to the cam-shaft 34, whereby the latter is rotated. The eccentric-shaft 24 is driven by a gear 226 (Fig. 1) meshing with the gear 225, and the diameters of these gears have the ratio of three to one, whereby the eccentrics are rotated at the proper speed to cause them to operate as hereinbefore described. The cam-shaft 78 is driven by two gears, on this shaft and the shaft 24, respectively one of which 228 is shown in Fig. 1.

In order that the machine may be started and stopped by the operator, the "Horton" clutch is provided with a lug 229, by which it may be tripped in a manner common to such devices. This lug cooperates with a detent 230 mounted in the upper end of an arm 231, which is fixed to a rock-shaft 232 journaled on the frame of the machine. A second arm 234 depends from the rock-shaft and is pivoted through the head 236 to a horizontal connecting-rod 237, which is pivoted at 238, as shown in Fig. 1, to a vertical hand-lever 239 arranged in convenient position to be moved by the operator of the machine. The lower end of the hand-lever is pivoted, for convenience, upon a shaft 55. When the hand-lever is moved to the right (Fig. 1) the detent 230 is brought into the path of movement of the stop-lug 229 on the clutch, and the lug is thus arrested, and the clutch thrown out of operation, thereby bringing the cam-shaft 180 to rest, while the pulley 221 continues to rotate. A latch 240 is mounted upon the arm 231, beneath the detent, to engage the stop-lug and prevent rebound, in a manner common in such devices. When the operator desires to start the machine again, this is accomplished by moving the hand-lever in the direction op-

posite to that above described, thereby releasing the stop-lug and permitting the clutch to operate again.

It will be obvious from the foregoing description that the invention is useful in conjunction with machines for various purposes and for handling blanks of different materials, characteristics and forms, therefore, while for purposes of explanation the description has been confined to a blank handling mechanism with coöperative action in a heel building machine, the features of the invention will be found definitely stated in their true scope in the claims herewith.

It will be clear to those skilled in this class of machines and with the general objects of the present invention in view, that changes may be made in the details of structure and that the invention is not limited to the conjoint use of all its features, the described and illustrated embodiment thereof being intended as an exemplification of its underlying essentials, the features whereof are definitely stated in their true scope in the claims herewith.

What is claimed as new, is:

1. Blank handling mechanism comprising a casing having a blank engaging end face, blank impaling devices movably mounted at the end of said casing and normally housed within it, and means acting through the medium of a yielding device to advance said impaling devices beyond said end face and into the blank.

2. Blank handling mechanism comprising a casing having a blank pressing end face, movable blank impaling devices mounted within the end of the casing, means connected to said devices for projecting them outwardly from the plane of said end face and into the blank, an actuator for said means, and a spring interposed between said means and actuator whereby said impaling devices are advanced into the blank under a yielding pressure.

3. Blank handling mechanism comprising a casing having movable blank impaling devices at one end, a slide supporting said casing, a spring interposed between the slide and the casing, means for advancing the casing into engagement with a blank by pressure on the slide acting through said spring, and means for projecting said impaling devices into the blank after said casing has become engaged therewith.

4. Blank handling mechanism comprising a slide, a casing extended within the slide having a blank pressing face, yielding means between said slide and casing, means to actuate the slide and yieldingly advance the casing into engagement with a blank, blank impaling devices movably mounted in said face, an actuator for said devices for projecting them into a blank, and yielding

means interposed between said actuator and said devices.

5. Blank handling mechanism comprising a casing having a blank engaging end face, blank impaling devices movably mounted at said face, means for advancing the casing into engagement with a blank and for projecting said impaling devices into the blank, and a yielding medium through which said means acts in advancing the casing.

6. A blank-handling mechanism for seizing a blank by its plane surface comprising a plurality of divergently disposed blank-impaling devices adapted to engage the plane surface of the blank to be seized, and means for expansively actuating said devices to cause them to obliquely penetrate the surface of the blank.

7. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for supporting said devices, means for actuating said devices in divergent directions to impale a blank thereon, and means for retaining said devices in impaling relation to said blank.

8. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for supporting said devices, means for actuating said devices in divergent directions to impale a blank thereon, means for retaining said devices in impaling relation to said blank and for releasing said retaining means to permit the withdrawal of said devices from the blank.

9. A blank-handling mechanism comprising a body member, a plurality of expansively acting blank-impaling devices mounted upon the body member, and means carried by said body member for expanding said devices to penetrate the face of a blank and subsequently contracting the devices to release the blank.

10. A blank-handling mechanism comprising a body-member, a plurality of expansively acting blank-impaling devices mounted upon the body-member, and means carried by the body-member for expanding said devices to penetrate the face of a blank, latching the devices expanded while engaged in the blank, and subsequently contracting said devices to release the blank.

11. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for expansively actuating said devices in divergent directions to penetrate and impale a blank, and means for latching said devices in their impaling positions.

12. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for actuating said devices to penetrate and impale a blank, latching means associated with said mechanism, and means for actuating said latching means to positively lock said impaling devices in their impaling positions and to release said

latching means to permit the withdrawal of said devices from the blank.

13. A blank-handling mechanism comprising a plurality of blank-impaling devices, means expansively actuating said devices to cause them to divergently penetrate the surface of a blank and to effect their withdrawal therefrom, and means for engaging the surface of the blank and stripping the blank from said devices when said devices are withdrawn from the blank.

14. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for supporting said devices, means for actuating said devices in divergent directions to impale a blank thereon, means for retaining said devices in impaling relation to said blank, means for releasing said retaining means to permit the withdrawal of said devices, and means for withdrawing said devices from the blank.

15. A blank-handling mechanism comprising a supporting member, arms pivotally mounted thereon and having blank-impaling devices, means for actuating said arms to cause said devices to be moved in divergent directions to impale a blank, and means for restoring said arms to their initial positions to withdraw said devices from the blank.

16. A blank-handling mechanism comprising a plurality of blank-impaling devices, means for actuating said devices to penetrate and impale a blank, a latch associated with said mechanism, and means cooperating with said latch for causing it to positively lock said impaling devices in their impaling positions.

17. Blank-handling mechanism comprising a body member provided with movable blank-impaling devices, an actuating mem-

ber carried by said body member operable to advance said devices into blank-impaling positions, means for locking said member and said devices in blank-engaging positions and for releasing said member to permit said devices to be disengaged from the blank, and means for operating said actuating member to withdraw said devices from the blank when said member and devices are released.

18. Mechanism for handling blanks comprising a body member, divergently disposed impaling devices pivotally mounted thereon, the relation of each device to its pivot being such that the turning movement is in extension of the length of the device, and means for causing said devices to expansively penetrate the blank.

19. Mechanism for handling blanks comprising a body member having a plurality of slots in its blank-engaging face, picker claws severally pivotally mounted in said slots and having eccentric curved edges converging to a sharp claw point, the outer edge being on an arc described about the pivotal point of the claw as a center, and means carried by the body member and engaging said claws for projecting said claws from the slots and into impaling engagement with the blank to be handled.

20. Blank-handling mechanism comprising a body member having a blank-engaging face and a plurality of radially disposed slots therein, a plurality of blank-engaging devices movably mounted one within each slot, and means for actuating said devices to impale the blanks obliquely and radially whereby said blank is seized and supported.

ERASTUS E. WINKLEY.

It is hereby certified that in Letters Patent No. 1,355, 296, granted October 12 1920, upon the application of Erastus E. Winkley, of Lynn, Massachusetts, for an improvement in "Apparatus for Handling Blanks," errors appear in the printed specification requiring correction as follows: Page 2, strike out all commencing with the words "To the," line 3, to and through the word "which," line 10; page 3, line 117, strike out the word "illustrated"; page 5, line 89, claim 7, for the word "fer" read *for*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of November, A. D., 1920.

[SEAL.]

L. B. MANN,

Acting Commissioner of Patents.

Cl. 214—1.