F. V. HART.

MEANS FOR FEEDING ARTICLES IN STACKED RELATION.

APPLICATION FILED OCT. 16, 1916.

1,352,745. **Patented Sept. 14, 1920.**

2 SHEETS—SHEET 1.

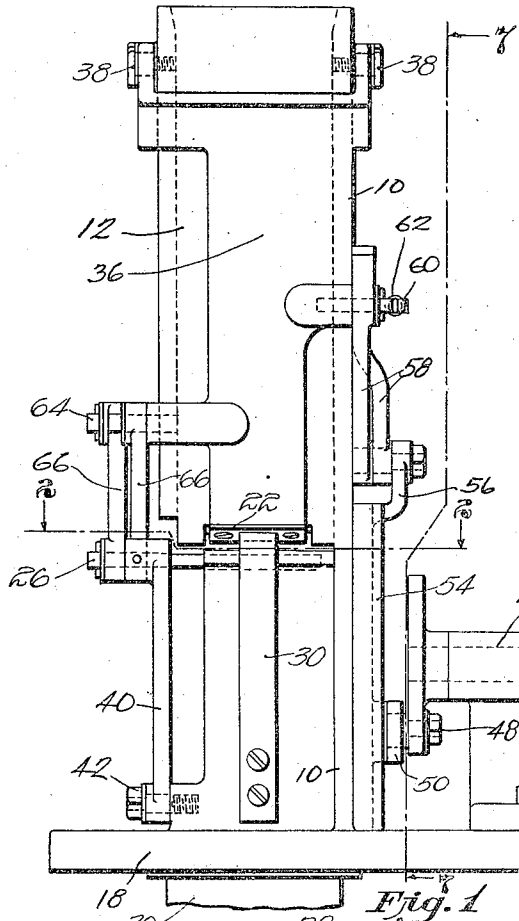


Fig. 1

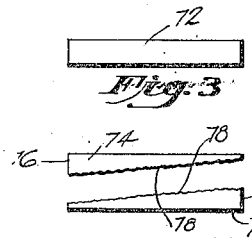


Fig. 3

Fig. 4

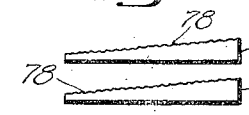


Fig. 5

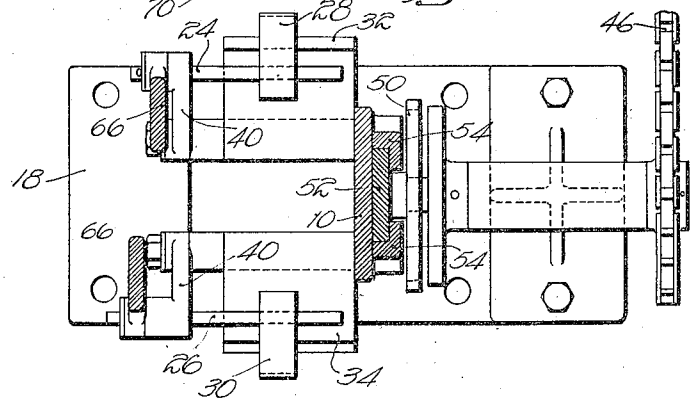


Fig. 2

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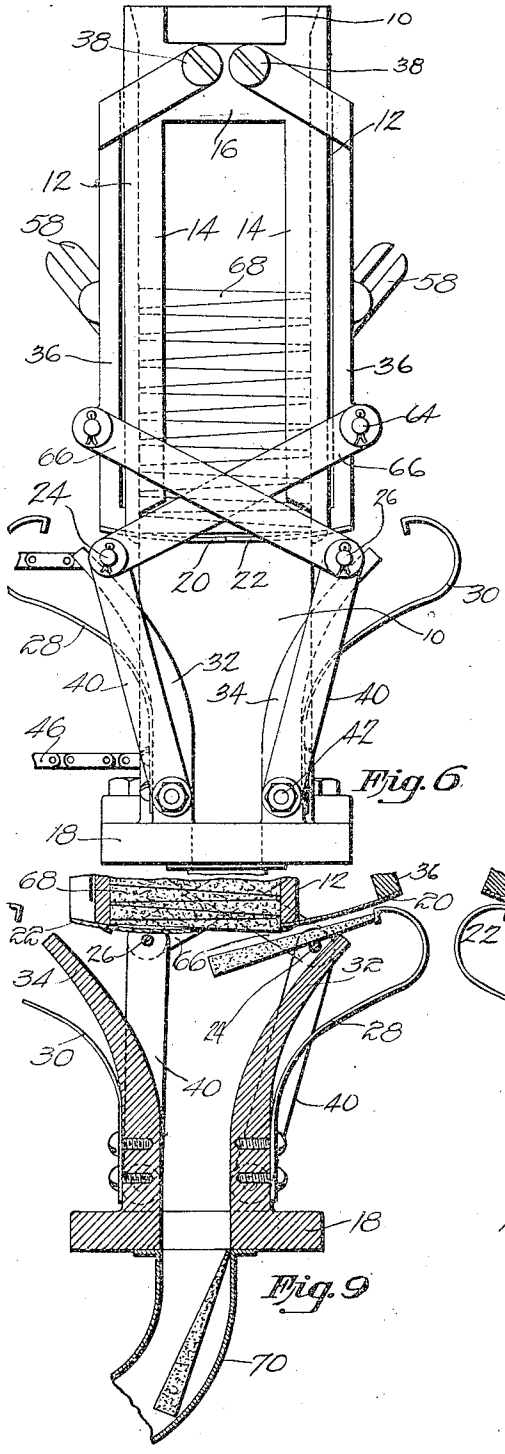


Fig. 6

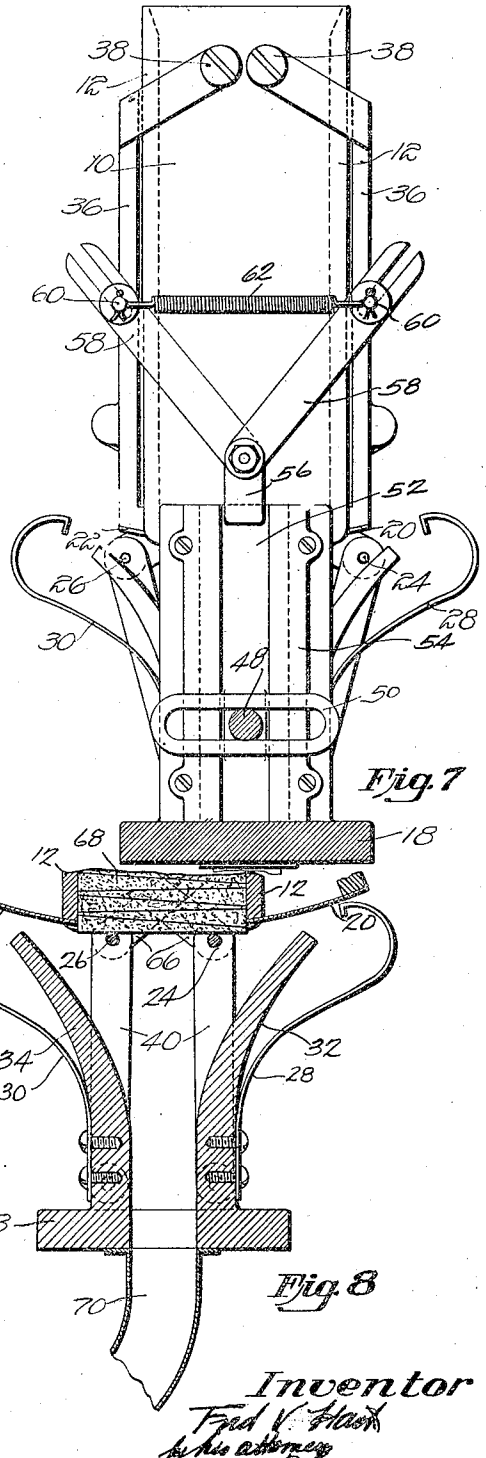


Fig. 7

Fig. 9

Fig. 8

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UNITED STATES PATENT OFFICE.

FRED V. HART, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MEANS FOR FEEDING ARTICLES IN STACKED RELATION.

1,352,745. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed October 16, 1916. Serial No. 125,953.

To all whom it may concern:

Be it known that I, FRED V. HART, 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 Means for Feeding Articles in Stacked Relation; 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 means for feeding pieces or articles of sheet heel material successively from a stack.

The invention is particularly adapted for use in feeding pieces of sheet heel material which are wedge-shaped or tapering in one of their dimensions, and therefore not uniform in thickness. In feeding articles or pieces of sheet material, it is common to arrange them in a stack, and to discharge them successively from one end of the stack. This mode of operation is easily carried out where each article is of uniform thickness from one extremity to another, so that the articles will stack in parallel positions when lying one against another. When the articles to be fed are not of uniform thickness, however, but are tapered or wedge-shaped in one dimension, such articles will not stack properly if lying loosely one against another with their similar extremities together.

One object of the present invention is to provide mechanism by which articles of sheet material tapering or wedge-shaped, or otherwise irregular in one dimension, may be stacked together and then delivered successively from one end of the stack, all in similar positions with respect to their thicker and thinner extremities.

In an application for Letters Patent of the United States, filed May 22, 1916, Serial No. 99,259, (renewal Ser. No. 202,643) by the present inventor, a feed-mechanism has been disclosed which is adapted to operate upon wedge-shaped articles of sheet heel material which have been stacked with their similar extremities together, the method employed in the mechanism of said application involving the use of special means for supporting the thinner edges of the articles in suitably spaced relation and out of contact with each other, in order that they may stack properly. In some cases, however, it is more convenient to stack the articles with dissimilar extremities alternating, *i. e.*, with the thicker extremity of the article interposed between the thinner extremities of the adjacent articles, and in accordance with the present invention, the articles are so arranged. The articles, when so arranged, may be readily stacked with their central planes in parallelism without the necessity of any special provision for supporting their thinner extremities, but it will be apparent that if they be discharged one by one in the usual manner from the end of the stack, they will occupy, as so discharged, alternate positions with respect to their thicker and thinner extremities.

Broadly considered, therefore, the present invention contemplates acting upon tapering or non-uniform articles of sheet material that are stacked in alternate or dissimilar relation in such manner that they are all caused to occupy similar positions with respect to their thicker and thinner extremities. In the specific machine hereinafter described, this result is attained by turning the articles about axes parallel to their surfaces after they are discharged from the stack. The invention, as defined by the claims, however, is not so restricted, but is of sufficient scope to include turning the articles about other axes and either before or during their discharge from the stack.

The mechanism of the present invention is well adapted for use in cases where wedge-shaped blanks, such as those used in the construction of shoe-heels, are produced in pairs by severing uniformly thick blanks or strips each into two pieces by a cut inclined to the original surfaces of the blank or strip. In such a case, the pair of blanks so produced may be stacked one upon the other in the relative position in which they are produced by the severing operation, so that not only are the thicker and thinner extremities alternated, but also the inclined surfaces produced by the severing operation are together or in contact.

With reference to blanks so arranged, a broad feature of the present invention resides in operating upon the pieces in a manner to insure that they occupy similar positions, not only with respect to their thicker

and thinner extremities, but also with respect to their two non-analogous surfaces.

While, for illustrative purposes, this feature is set forth as embodying mechanism for turning the articles subsequent to their discharge from the stack, the invention, in its broad aspect and as defined by the appended claims, is independent of the sequence in which the turning movement and the discharging operation is effected.

To the foregoing ends, the invention resides in the mechanism for feeding articles of sheet material in stacked relation hereinafter more particularly described, and illustrated in the accompanying drawings.

In the drawings Figure 1 is a side-elevation of a feed-mechanism constructed in accordance with the present invention;

Fig. 2 is a plan view, partially in section on the line 2—2 in Fig. 1;

Fig. 3 is a cross-section of a piece of sheet-material of uniform thickness;

Fig. 4 is a cross-section showing the material of Fig. 3 divided into two wedge-shaped pieces of a character which the illustrated machine is adapted to feed;

Fig. 5 shows the two pieces of Fig. 4 turned into similar positions with respect to their analogous edges, as these pieces are discharged by the feed-mechanism;

Fig. 6 is a front-elevation of the machine of Fig. 1;

Fig. 7 is a rear-elevation in section on the line 7—7 in Fig. 1; and

Figs. 8 and 9 show, in vertical section looking from the rear toward the front, two different positions of the feed-mechanism and the articles fed thereby.

In the specific form of the invention illustrated in the drawings, the articles operated upon are substantially rigid wedge-shaped pieces of sheet-material, such as those employed for the wedge-lifts of certain types of shoe-heels. These pieces are preferably stacked in strictly alternate positions, that is, with the thicker edge of one blank in engagement with the thinner edge of the next blank, and are then discharged one by one from the end of the stack, and each piece, as it is discharged, is supported momentarily near its thinner edge, so that by the action of gravity the thicker edge is caused to fall while the blank swings about a line at which it is supported, the result being that the lift descends into a discharge-chute or passage with its thicker edge foremost in each case.

The invention is illustrated as embodied in a feed-mechanism comprising a vertical magazine in which the blanks are stacked. This magazine has a rear-wall 10 and two side-walls 12. The front of the magazine is to a considerable extent open, but is partly closed by vertical flanges 14, projecting inwardly from the side-walls 12, and by a cross-bar 16 near the top of the magazine. The open space at the front of the magazine permits access for convenience in stacking the blanks therein and observing the quantity of blanks remaining in the stack. The rear-wall 10 extends downwardly to a base 18, and constitutes means for supporting the magazine.

The means for controlling the discharge of the blanks comprise two pushers 20 and 22 in the form of thin plates, and two supporting-members, in the form of pins 24 and 26, which coöperate with the pushers 20 and 22 in controlling the discharge of blanks from the stack. The pins also participate in the operation of turning the blanks, and this operation is facilitated and completed by two spring-fingers 28 and 30 and two curved guide-walls 32 and 34.

The pushers 20 and 22 are fixed on the lower ends of upright levers 36, located on opposite sides of the magazine, and the upper ends of these levers are pivoted to the magazine by means of pivot-screws 38, so that the levers may be swung outwardly from the sides of the magazine. The pins 24 and 26 project rigidly, in horizontal position, from the upper ends of two arms 40 by which they are supported, these arms being pivoted at their lower ends, on studs 42 on the guide walls 32 and 34, and these walls being formed integrally with the base 18. The spring-fingers 28 and 30, which may be formed of resilient strips of metal, are also secured to the guide-walls.

For the purpose of actuating the mechanism, a drive-shaft 44 is journaled, in horizontal position, in a bearing supported on the base 18, and this drive-shaft is connected, by means such as a sprocket-chain 46, with any suitable source of power. At its forward end, the shaft carries a crank-disk in which a crank-pin 48 is fixed, and this pin plays in a horizontal guideway 50 formed on a slide 52. This slide moves vertically in ways 54 fixed to the rear-wall 10 of the magazine, and the slide is provided, at its upper end, with an arm 56 which is pivotally connected with two bars 58. The bars are slotted at their upper ends so as to embrace pivot-pins 60 projecting, respectively, from the levers 36. A tension-spring 62 connects the levers and tends to swing them toward each other and into the position shown in Fig. 7.

The pins 24 and 26 are actuated by connection with the levers 36. For this purpose, pivot-pins 64, projecting forwardly from the levers, are connected, by crossed links 66, with the two pins respectively, so that each pin participates in the movement of the opposite lever 36, the pins being guided in an approximately horizontal direction by the arms 40 swinging about their pivots 42.

In Figs. 6, 8 and 9, the blanks 68 are shown as stacked in strict alternation with their central planes in parallelism, the thicker edge of each blank being in engagement with the thinner edges of the blanks immediately above and below. At the time the magazine is first loaded with blanks, as shown in Figs. 6 and 7, the weight of the stack is supported by the pushers 20 and 22, the lowermost blank resting directly upon the pushers. By the rotation of the drive-shaft, the slide 52 is then raised, and the bars 58 swing both of the levers 36 outwardly, so that the pushers are swung outwardly from the bottom of the stack to a position somewhat beyond that shown in Fig. 8. By the same movement of the levers 36, the pins 24 and 26 are swung inwardly, so that they lie beneath the stack. Accordingly, since the lowermost blank is no longer supported by the pushers, the stack descends until the lowermost blank rests upon the pins, as in Fig. 8.

The slide 52 next descends, and the spring 62 tends to cause the levers 36 and the pushers to swing inwardly again to their original positions. This swinging movement is interfered with, however, by engagement of the ends of the pushers with the edges of the blanks. The relation of the parts is such that the lowermost blank lies with its thinner edge entirely clear of the side-walls 12 of the magazine (see Fig. 8). Accordingly this blank is free to be moved horizontally in its own plane and in the direction of its thinner edge, and this occurs owing to the pressure against its thicker edge of one of the pushers. As shown in Fig. 8, the lowermost blank is in position to be ejected toward the right by the pusher 22, and this pusher accordingly swings inwardly under the influence of the spring 62. At the same time, the blank next to that at the bottom of the stack is engaged, at its thicker edge, by the pusher 20. The thinner edge of this blank, however, is not in position to permit the blank to move, since it is in engagement with the side-wall of the magazine. Accordingly the pusher 20 is prevented, at this time, from moving inwardly, and the pusher 22 alone moves. In doing so, it also moves the pin 24, causing this pin to travel to the right, as shown in Fig. 9, with the blank. This movement continues until the thicker edge of the blank has passed beyond the pin 26, while at the same time the thinner edge of the blank is pushed against the spring-finger 28 and bends it outwardly. As soon as the blank has passed beyond the pin 26, the effect of gravity causes the thicker edge of the blank to fall away from the pusher 22, while at the same time, the spring-finger pushes against the thinner edge moving the blank inwardly in its own plane so as to clear this edge from the pin 24 and prevent it from jamming between the pin and the lower surface of the pusher 20. In Fig. 9, the blank is shown in the act of falling, and it falls upon the curved guide-wall 32, which continues the turning movement of the blank so as to insure that it shall be discharged with the thicker edge downward. The base is shown as provided with an opening through which the blank is discharged into a guide chute 70, by which it may be directed to any machine in which the blank is to be utilized or operated upon.

The next reciprocation of the slide 52 causes the pusher 22 to be withdrawn from beneath the stack of blanks, at the same time pulling the pin 24 inwardly to its original position. The stack of blanks then descends in the magazine until it again rests on the pins 24 and 26 bringing the thinner edge of the lowermost blank, still engaged at its thicker edge by the pusher 20, below the wall 12 and permitting this blank to be ejected in the manner just described. When the pusher 20 is operating to eject blanks, the blank turns about the pin 26 and is urged into the guide chute 70 by the spring-finger 30.

While it is necessary that the blanks be so arranged in the magazine that the thicker and thinner edges alternate to provide, at each side of the stack, a substantially equal number of thick and thin edges, it is not necessary that there be a strict alternation. On the contrary, the blanks may be so stacked as to bring the corresponding edges together in several adjacent blanks without preventing the production of a suitable stack, and the present machine will operate regardless of such irregularities in the stacking of the blanks, for in every case the lowermost blank of the stack will be discharged in one direction or the other, automatically, according to the location of its thicker and thinner edges, and will then be turned automatically so as to bring its thicker edge below. It should be understood, therefore, that in the claims the terms "alternating" and "alternately" are not used in a strict sense, and are not exclusive of an arrangement in which the alternation is more or less irregular.

The invention has been particularly described in so far as it relates to feeding articles of sheet material all in the same position with respect to their thicker and thinner extremities. In some cases, however, it is desirable that the position be uniform with respect also to the lateral surfaces or faces of the articles. Reference has been made to the use of such a machine in connection with the wedge-lift for shoe-heels. One method by which such wedge-lifts may be manufactured is to produce a strip of leather-board or other suitable sheet-material, such as the strip 72 shown in Fig.

3, and to divide this strip into two wedge-shaped pieces by splitting it on an inclined plane, as shown in Fig. 4. In each of the strips so produced, there is a surface 74 which is at a right-angle to the thicker edge 76 of the strip and a surface 78 which is at an acute angle to the edge 76. The strip is then divided into shorter pieces or lifts. In utilizing one of these wedge-lifts in a heel it is desirable that it be placed with the surface 78 at the top, since this causes the edge 76 to lie at an angle more nearly approximating the angle of the pitch of the heel, so that the material may be more economically utilized than if the lift were in inverted position. Accordingly, in feeding such wedge-lifts, it is desirable to feed them all in positions which are similar, not only as to the thicker and thinner edges, but also as to the two non-analogous faces of the lifts. In accordance with the present invention, this is accomplished by stacking the lifts in the magazine in pairs, in the relative position shown in Fig. 4. When so stacked all of those lifts which have their thicker edges 76 at the right, for example, will have their inclined surfaces 78 at the top, while all those lifts which have their thicker edges at the left will have their inclined surfaces 78 at the bottom. Upon considering the mode of operation of the illustrated machine, it will be apparent that when the lifts are so arranged, each lift will be discharged with its surfaces 74 and 78 in a given position, owing to the fact the lifts of each pair are swung in opposite directions after their discharge from the magazine.

While the illustrated mechanism embodying the present invention shows a magazine for receiving such small tapering articles of sheet material as wedge-lifts for shoe-heels, it is to be understood that, broadly considered, the invention is of utility in handling tapering articles of sheet material of various dimensions and is not limited to any particular shape or size of blank, the true scope of the invention being found defined in the appended claims.

The nature and scope of the invention having been indicated, and its preferred embodiment specifically described, what is claimed as new, is:

1. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding the articles in a stack in face-to-face relation with their thicker and thinner extremities alternating, and means for delivering articles from the stack successively and all in similar positions with respect to their thicker and thinner extremities.

2. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, a means for holding a stack of such articles in dissimilar positions; and means for withdrawing the articles successively from the stack and for turning the articles, so withdrawn, into similar positions with respect to their thicker and thinner extremities.

3. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding a stack of such articles with their thicker and thinner extremities alternating; and means for withdrawing the articles successively from the stack and turning the articles so withdrawn alternately in opposite directions, so as to bring them all into similar positions with relation to their thicker and thinner extremities.

4. A shoe machine for feeding tapering articles of sheet heel material, having in combination, means for holding the articles in a stack with their thicker and thinner extremities alternating; and means for withdrawing articles successively from the end of the stack and for swinging them, about axes transverse to the direction of extension of the stack, to bring the articles into similar positions with respect to their thicker and thinner extremities.

5. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding a stack of articles arranged in pairs with the thicker extremity of each article contiguous to the thinner extremity of the article paired therewith; and means for discharging articles successively from the end of the stack and for turning one article, of each pair, into a similar position, with respect to its thicker and thinner extremities, to that in which the other article of the pair is discharged.

6. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding a stack of such articles with their thicker and thinner extremities alternating; and means, for withdrawing articles successively from the stack, operating automatically, in accordance with the positions occupied by the several articles, to turn the articles so withdrawn all into similar positions with respect to their thicker and thinner extremities.

7. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding such articles stacked in pairs, with analogous faces of each pair together and non-analogous extremities contiguous; and means for delivering articles from the stack successively and all in similar positions with respect to their faces and their extremities.

8. A shoe machine for feeding articles of sheet heel material having dissimilar faces, having, in combination, means for holding the articles in a stack with analogous faces of the articles together; and means for delivering articles successively

from the end of the stack and for turning alternate articles so delivered into positions similar with respect to said faces, to those in which the intermediate pieces are delivered.

9. Mechanism, for feeding tapering articles, having, in combination, means for holding a stack of such articles with their thicker and thinner extremities oppositely disposed; and means for expelling the articles successively from the end of the stack by lateral movements in opposite directions according to the positions of the several articles, and for thereafter turning the articles so expelled in one direction into positions similar to those of the articles expelled in the opposite direction, with respect to their thicker and thinner extremities.

10. Mechanism, for feeding tapering articles, having, in combination, means for holding a stack of such articles with their thicker and thinner extremities oppositely disposed; means for expelling articles successively, from the end of the stack, each in the direction of its thinner extremity; and means for turning the articles, so expelled, all into similar positions with respect to their thicker and thinner extremities.

11. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, a stack-holder in which the articles may descend by gravity; a support for the lowermost article in the stack; means for expelling articles successively from the bottom of the stack by a transverse movement in the directions of their thinner extremities; and means for turning each article, so expelled, into a predetermined position through the action of gravity on the article.

12. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, means for holding said articles in face-to-face alternately stacked relation; means for supporting the lowermost article in the stack; and means for delivering articles successively from the bottom of the stack, said means being constructed and arranged to release and drop each article so delivered but to so control its fall as to turn the articles all into similar positions with respect to their thicker and thinner extremities.

13. Mechanism, for feeding tapering articles, having, in combination, a stack-holder in which the articles may descend by gravity; a supporting member for supporting the lowermost article in the stack; an expelling-member for expelling the lowermost article in a lateral direction from the bottom of the stack; and means for moving the supporting-member, to a position beneath the advanced extremity of the article so as to serve as a fulcrum upon which the article may turn in falling.

14. A shoe machine for feeding tapering articles of sheet heel material, having, in combination, a stack-holder in which the articles may descend by gravity; means for expelling the articles successively from the bottom of the stack and each in the direction of its thinner extremity; and means including converging guide walls for directing each article so expelled into a position of discharge with its thicker extremity lowermost.

15. A shoe machine for feeding uniformly tapering articles of sheet heel material having, in combination, means for holding said articles in face-to-face alternately disposed stacked relation, and means for delivering the successive articles from one end of the stack.

16. A shoe machine for feeding uniformly tapering articles of sheet heel material having, in combination, means for holding said articles in face-to-face alternately disposed stacked relation, and means acting positively upon the successive articles for removing them from one end of the stack.

17. A shoe machine for feeding tapering articles of sheet heel material having, in combination, means for holding said articles in face-to-face stacked relation with their thicker and thinner ends alternating, and means for delivering the successive articles from one end of the stack and for causing all the delivered articles to occupy similar positions with respect to their thicker and thinner ends.

18. Mechanism for feeding tapering articles having, in combination, means for holding said articles in face-to-face stacked relation with their thicker and thinner ends alternating, and means for expelling the articles successively from one end of the stack by lateral movements in opposite directions in accordance with the positions of the several articles.

19. A shoe machine for feeding stacks of sheet heel material having, in combination, means for holding a stack of said articles disposed in face to face relation, a plurality of supports upon which the lowermost article in the stack rests, means for actuating the lowermost article in one direction into an inclined position in which it is free of one of said supports and means for actuating said article in substantially the opposite direction to remove it from the other support.

20. Mechanism for feeding substantially rigid articles of sheet material having, in combination, means including members spaced apart a distance less than the corresponding dimension of the articles for supporting an article at separated marginal points, and means for pushing the article in substantially its own plane first in one

direction and then in another to feed it past the supporting members and through the space between them.

21. Mechanism for feeding substantially rigid articles of sheet material having, in combination, means including members spaced apart a distance less than the corresponding dimension of the articles for supporting an article at separated marginal points, and a plurality of pusher members for alternately engaging opposite edges of the article and actuating it in substantially the plane of the article in opposite directions to free it from the supporting members and feed it through the space between them.

22. Mechanism for feeding substantially rigid articles of sheet material having, in combination, means including members spaced apart a distance less than the corresponding dimension of the articles for supporting an article at separated marginal points, and means for engaging the article and actuating it in substantially the plane of the article in different directions to feed it through the space between the supporting members.

23. Mechanism for feeding substantially rigid articles of sheet material having, in combination, means including members spaced apart a distance less than the corresponding dimension of the articles for supporting an article at separated marginal points, and means for causing opposite relative movements between the article and the supporting members in the general direction of the plane of the article to successively free the article from the supporting members and feed it through the space between them.

24. Mechanism for feeding substantially rigid articles of sheet material having, in combination, means including members spaced apart a distance less than the corresponding dimension of the articles for supporting the stack of superposed articles at separated marginal points upon the lowermost article of the stack, and means for engaging the successive lowermost articles of of the stack and actuating them in substantially the planes of the articles in different directions to separate them successively from the stack and drop them through the space between the supporting members.

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