Oct. 9, 1923. 1,469,840

C. D. KNOWLTON

FEED MECHANISM

Filed Oct. 31, 1919 2 Sheets-Sheet 1

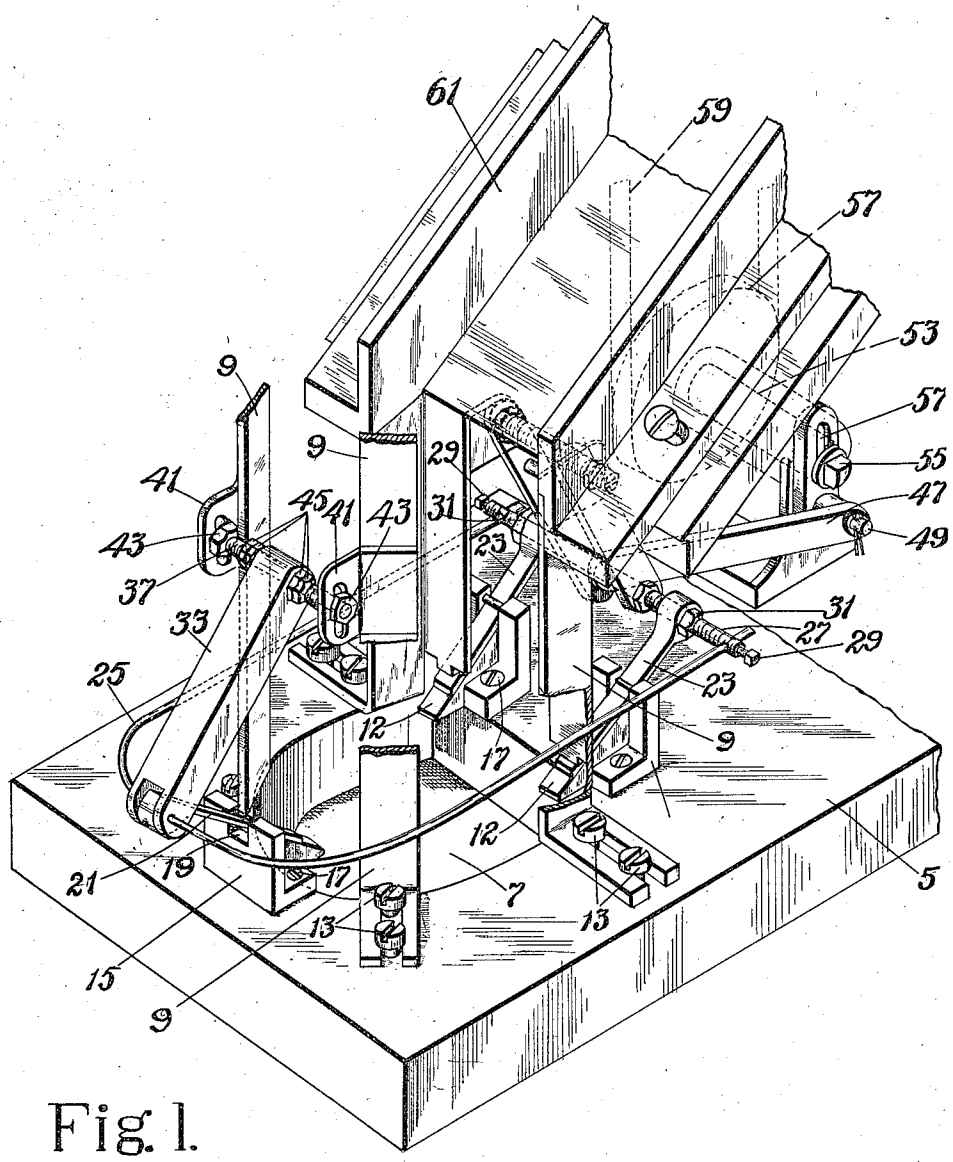


Fig. 1.

INVENTOR—
Cutler D. Knowlton
By his Attorney,
Nelson W. Howard

Oct. 9, 1923. 1,469,840

C. D. KNOWLTON

FEED MECHANISM

Filed Oct. 31, 1919 2 Sheets-Sheet 2

Fig. 2.

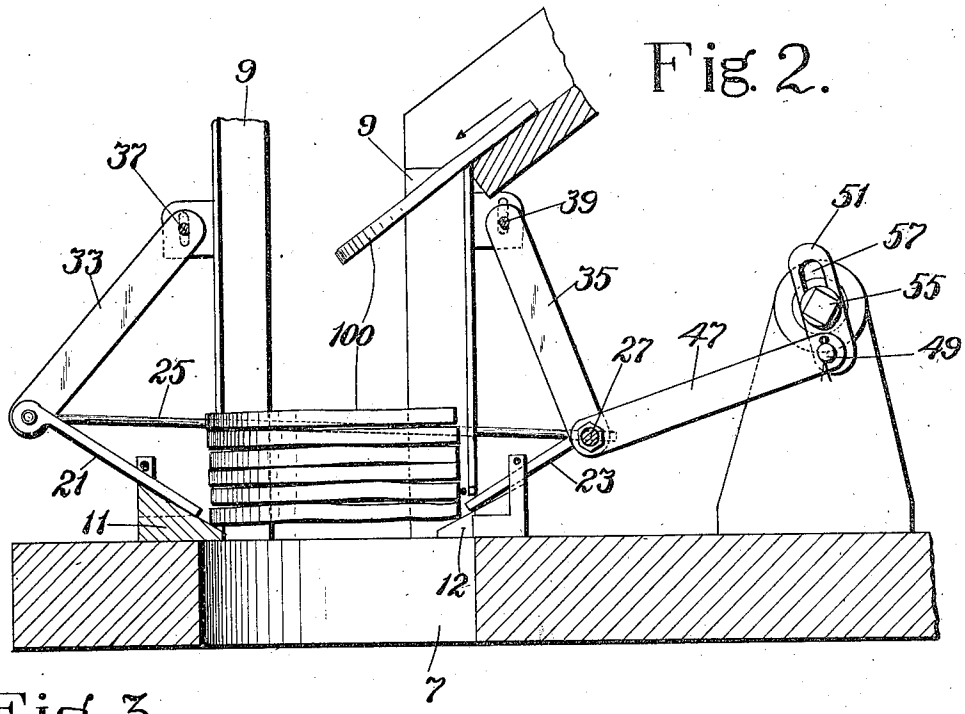


Fig. 3.

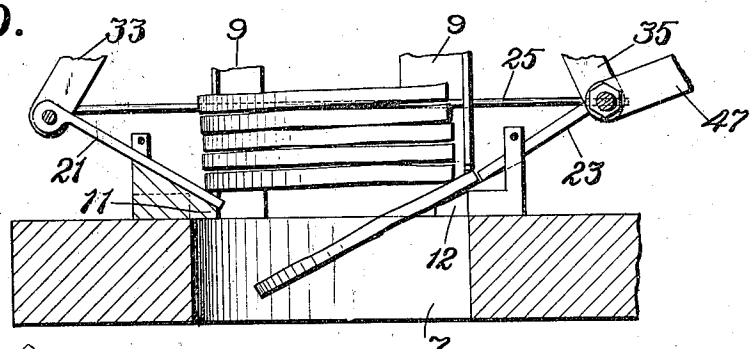
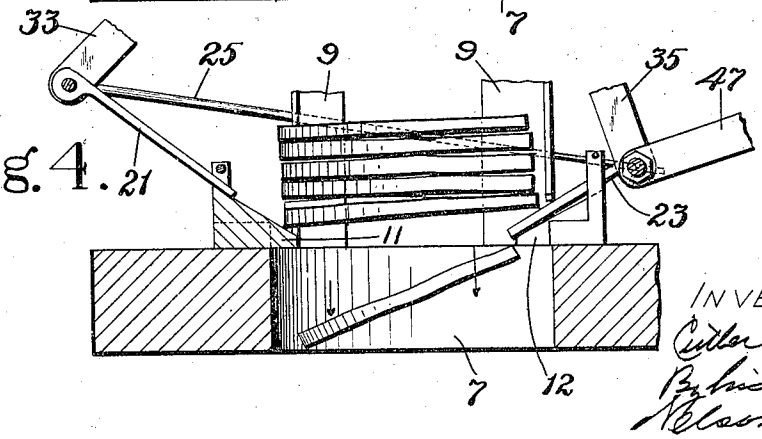


Fig. 4.



INVENTOR-
Cutler D. Knowlton
By his Attorney,
Elsom M. Howard

Patented Oct. 9, 1923. 1,469,840

UNITED STATES PATENT OFFICE.

CUTLER D. KNOWLTON, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FEED MECHANISM.

Application filed October 31, 1919. Serial No. 334,773.

To all whom it may concern:

Be it known that I, CUTLER D. KNOWLTON, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Feed 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 feed mechanisms and is herein illustrated as embodied in a machine for feeding articles one by one from one end of a stack.

In handling heel lifts which are to be used in the manufacture of boots and shoes it is common to stack the lifts in a magazine and to feed them one by one from the magazine to some machine, for example a splitting machine, which is to perform an operation upon them. A usual mechanism comprises a magazine for holding the stack of lifts and a reciprocating feed slide which operates upon that lift which is lowermost and pushes it from beneath the stack so that as each succeeding lift becomes the lowermost lift, it is fed forward. A mechanism of this type requires comparatively heavy moving parts to operate successfully and is adapted for use only on lifts or articles which are flat. When warped or curled lifts are encountered either the feed slide does not properly engage the rear end of a given lift as it should or the forward end of the lift strikes the front wall of the magazine.

The general object of the present invention is to overcome these difficulties as well as to provide an improved mechanism with lighter moving parts for feeding articles whether or not they are distorted.

According to one feature of the invention the stack of articles is supported on stationary means adapted to resist force applied in the direction of the length of the stack, and means are provided for manipulating the article which is in contact with the supporting means to move it past the supporting means in the general direction of the length of the stack. In the illustrative machine the stack rests by gravity upon the supporting means, and the articles are fed from the supporting means one by one by reciprocating feed members and dropped into a chute or passageway which may direct them to any desired machine. A mechanism of this type may have lighter moving parts than those of the old type and is more desirable in feeding articles to certain mechanisms, for example to a conveyor.

According to another feature of the invention the supporting means comprises three spaced members through the space between which the articles are fed. In the illustrative machine the three spaced members engage the article respectively at a point on one edge and at two points on the opposite edge. Consequently, irrespective of whether a particular article is warped or not, the locations of three points on its edge tend to become fixed as soon as the article rests upon the support. The reciprocatory feed member then engage opposite edges of the article alternately at those points so as to move the article first in one direction to free it from one supporting member and then in the opposite direction to free it from the remainder of the supporting members whereupon the article drops into the passageway which has been referred to above.

These and other features of the invention including certain details of construction and combinations of parts will be described as embodied in an illustrative machine and pointed out in the appended claims.

Referring now to the accompanying drawings,—

Fig. 1 is a perspective of a machine in which the present invention is embodied.

Figs. 2, 3 and 4 are views, principally in section, showing the feed members in different positions occupied by them during the operation of the machine.

The base 5 of the machine has formed in it a passageway 7 through which the lifts are to be fed one by one, the lifts being delivered from the passageway to a suitable part, for example a rotatable table or other conveyor. Located above the passageway 7 is a magazine, said magazine comprising walls or guides 9 and supporting members 11 and 12. The guides have slotted, right-angled extensions at their lower ends and are adjustably fastened to the base 5 by screws 13. The supports are triangularly arranged so as to engage the lowermost lift of the stack at three localities, one at or near one edge and two at or near the opposite edge. Each support has a supporting face inclined at an

angle of about forty-five degrees and is fast to or integral with a holder 15, each holder being fastened to the base 5 by screws 17 and having in its upper edge a rectangular groove 19 which is in line with the inclined face of the corresponding supporting member. Extending through the grooves with their ends in contact with the inclined surfaces of the supporting members are feed members 21 and 23.

The illustrative machine is designed to operate upon heel lifts 100 which, as shown in Figures 2, 3 and 4, are stacked in the magazine, the lifts being held in substantial alinement by the guides 9, and the stack being supported by engagement of the supporting members 11 and 12 with the under side of the lowermost lift. The member 11 engages a locality at or near the rear edge of the lowermost lift, and the members 12 engage two localities at or near the opposite or front edge of the lift. In consequence of this three-point support, the lift, whether warped or not, is in contact with the three supporting members and will be engaged by the feed members when they are operated. It is, of course, conceivable that a lift might be warped to such an extent that it would contact with only two of the supporting members but such extreme distortion is rare; and even then if the distortion were not too extreme the lift would be fed.

The feed members 21 and 23 are pivoted to a frame 25 which might be any one of various shapes but is herein shown as U-shaped with a rod 27 adjustably fastened by set screws 29 to the legs of the U. Upon this rod are pivoted the feed members 23, while the feed member 21 is pivoted to the base of the U. The rod 27 is threaded; and nuts, two of which are shown at 31, are provided for properly adjusting and positioning the feed members 23 on the rod 27. The frame 25 is suspended by links 33, 35, said links being pivoted at their lower ends upon the frame and at their upper ends respectively upon rods 37, 39. The rod 37 extends through vertical slots formed in ears 41 which are carried by two of the guides 9 and is adjustably held in position by nuts threaded on the rod, two of said nuts being shown at 43. The position of the link 33 on the rod 37 may be adjusted and fixed by means of nuts 45. The mounting of the links 35 is similar to that of the link 33 and will not be described in detail. It will be noted, however, that the frame 25 is suspended by the links 33 and 35, and that when the frame is reciprocated the feed members 21, 23 are moved in unison first in one direction and then in another. The reciprocation of the frame 25, and with it of the feed members 21, 23, is accomplished by a connecting rod 47 which is pivoted at one end upon the rod 27 of the frame and at the other upon a pin 49 carried by a crank arm 51. The crank arm is adjustably fastened to a rotary shaft 53 by a cap screw 55 which passes through a slot in the crank arm and is threaded into the shaft. A pulley 57, fast to the shaft 53 and driven by a belt 59 serves to rotate the shaft. Mechanism for applying power to the belt and for withdrawing it therefrom when desired has not been shown, but may be of any suitable type.

In the manufacture of heel lifts it is customary first to die them out and then to subject them to the operation of some other machine—if they are top lifts, commonly to a skiving machine or to a top lift compressor. In the drawings a chute 61 is shown into which the died out lifts may be delivered and from which they fall into the magazine as indicated in Fig. 2. And, as has been explained above, they are to be delivered from the magazine one by one by the mechanism which has been described above.

Assuming that the magazine has been filled or partially filled with a stack of lifts, as shown in Fig. 2, and that the parts of the machine occupy the positions shown, the operation of the machine is as follows: The frame 25 is pulled to the right thereby causing the feed member 21 to slide down the supporting member 11, engage the rear edge of the lowermost lift and push the lift to the right into the position shown in Fig. 3. This movement of the feed member 21 frees the lift from engagement with the supporting member 11 and permits the rear of the stack to descend until the rear of the next-to-the-lowermost lift rests upon the feed member 21. At this time the position of parts is that shown in Fig. 3, the lift having assumed an inclined position which is determined by the inclination of the supports 12. The frame 25 is then moved to the left during which movement the feed member 21 is withdrawn from beneath the stack, and the feed members 23 push the lowermost lift to the left thereby freeing it from the supporting members 12 and permitting it to fall into the passageway 7 as shown in Fig. 4. On the next movement of the frame 25 to the right, the parts of the machine pass through the positions shown in Fig. 2 and the cycle is complete. So long then, as the frame continues to reciprocate, the lifts will be delivered one by one from the bottom of the stack through the space between the supporting members 11 and 12. In the illustrative machine the thickness of the feed members and the spaces between the lower ends of the guides 9 and the inclined supporting members are such that only one lift is delivered at a time but it should be understood that the dimensions of these parts may be varied if desired.

Although the invention has been set forth as embodied in a particular machine, it

should be understood that the invention is not limited in the scope of its application to the particular machine which has been shown and described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A machine of the class described, having in combination, a magazine for holding a stack of articles in substantial alinement with one another having stationary means located to support one end of the stack and adapted to resist force applied in the direction of the length of the stack, and means for manipulating the article which is in contact with said supporting means while maintaining said article undistorted to move it past said supporting means in a path which extends in the same general direction as does the stack.

2. A machine of the class described, having in combination, a magazine for a stack of articles having stationary means upon which the lowermost article rests and by which the stack is supported, and means for manipulating the lowermost article to free it from engagement with the supporting means and permit it to fall directly into a position below the stack, while maintaining the angular position of the stack unchanged.

3. A machine of the class described, having in combination, guides for holding a stack of articles with their edges in substantial register with one another, spaced stationary supporting members arranged to contact with an article at one end of the stack and adapted to prevent movement of the stack along the guides and means for manipulating the article at the end of the stack to permit it to pass without distortion between the supporting members.

4. A machine of the class described, having in combination, means for holding a stack of articles, said means including stationary means for supporting the stack by engagement with an article at one end of the stack, and means for causing relative movement between the last-named article and the stack first in one direction to free one portion of the article from the supporting means and then in another direction to free the remaining portion of the article from the supporting means.

5. A machine of the class described, having in combination, means for holding a stack of articles, said means including stationary means for supporting the stack by engagement with an article at one end of the stack, and means for moving the last-named article first in one direction to free one portion of the article from the supporting means and then in another direction to free the remaining portion of the article from the supporting means.

6. A machine of the class described having, in combination, means for holding a stack of articles, said means including three stationary supporting members arranged in triangular pattern against which one end of the stack rests, and means for causing movement between the members and the article in contact with them to free the article from the member and permit it to pass through the space between them.

7. A machine of the class described, having in combination, means for holding a stack of articles, said means including three supporting members against which one end of the stack rests, and means for causing relative movement between the members and the article in contact with them first in one direction and then in the opposite direction to free the article from the supporting members.

8. A machine of the class described, having in combination, means for holding a stack of articles, said means including three triangularly arranged supporting members against which one end of the stack rests, and means for causing relative movement between the members and the article in contact with them first in one direction and then in the opposite direction to free the article from the supporting members.

9. A machine of the class described, having in combination, guides for holding a stack of articles in substantial alinement with one another, a support having three localities separated by an unbroken space and arranged to contact with an article at the end of the stack whereby the stack is maintained on one side of the support, and means for manipulating the article at the end of the stack to move it through the space to the other side of the support.

10. A machine of the class described, having in combination, guides for holding a stack of articles in substantial alinement with one another, a support having three separate localities arranged to contact with an article at the end of the stack whereby the stack is maintained on one side of the support, and means for moving the article at the end of the stack first in one direction and the in another to move it past the support.

11. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine comprising guides for holding the articles in substantial alinement with one another, and a triangularly arranged three-point support for the stack, opposed feed members, and means for causing said members to free the article which is in contact with the support first from certain of the points and then from the remainder.

12. A machine of the class described, having in combination, means for holding a stack of articles, a plurality of feed mem-

bers arranged on opposite sides of the stack and adapted to engage an article of the stack, and positively actuated means for causing relative movement between the stack and members to cause the article to be engaged by the members and separated from the stack.

13. A machine of the class described, having in combination, means for supporting a stack of articles, oppositely acting members for engaging an article of the stack, and means for positively operating the members to cause the article to be separated from the stack.

14. A machine of the class described, having in combination, means for supporting a stack of articles, opposed pushers for engaging an article of the stack, and means for positively operating the pushers to cause the article to be separated from the stack.

15. A machine of the class described, having in combination, means for supporting a stack of articles, pushers for engaging the lowermost article of said stack, and positively actuated means for moving the pushers alternately into engagement with said article, to cause said article to be separated from the stack.

16. A machine of the class described, having in combination, means for supporting a stack of articles, and means for positively pushing one of the articles, first in one direction and then in substantially the opposite direction to separate the article from the stack.

17. A machine of the class described, having in combination, a magazine for a stack of articles, two members arranged on opposite sides of the stack and adapted to engage an article of the stack, and means for causing each article of the stack to be engaged alternately by the members and moved first in one direction and then in another to separate it from the stack.

18. A machine of the class described, having in combination, a magazine for a stack of articles, a plurality of feed members, and means for causing certain of said members to engage one end of each article in said stack and move it in one direction, and for causing the rest of said members to engage the opposite end of each article and move it in substantially the opposite direction to separate the articles successively from the stack.

19. A machine of the class described having, in combination, a magazine for a stack of articles, opposed feed members for operating upon opposite sides of an article at one end of the stack, and means for moving the feed members together first in one direction and then in the other in such manner as to cause them to engage alternately the end article and move it first in a given direction and then in the opposite direction.

20. A machine of the class described having, in combination, a magazine for a stack of articles, feed members located on opposite sides of the stack, a member connecting the feed members in such manner as to hold them at all times spaced apart a distance sufficient to permit an article to pass between them, and means for reciprocating the connecting member.

21. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine including guides for holding the articles in substantial alinement and spaced inclined supports for engaging separated localities on the lowermost article, feed members slidable along said supports, and means for causing the members to operate alternately upon each article as it becomes the lowermost article and free it from the supports.

22. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine including guides for holding the articles in substantial alinement and spaced supports for engaging separated localities on the lowermost article, feed members slidable on the supports, and means for causing the feed members to operate alternately upon the lowermost article to separate it from the stack.

23. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine including guides for holding the articles in substantial alinement and spaced supports for engaging separated localities on the lowermost article, feed members slidable on the supports, and means for causing the feed members to operate alternately upon the lowermost article to move it through the space between the supports.

24. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine including guides for holding the articles in substantial alinement and spaced supporting means for engaging opposite ends of the lowermost article, the means for supporting one end of the last-named article being inclined to the horizontal, means for manipulating the last-named article to free the other end of the article whereby the freed end of the article will drop, and means for thereafter freeing the first-named end which is in contact with the inclined supporting means.

25. A machine of the class described, having in combination, a magazine for a stack of articles, said magazine including guides for holding the articles in substantial alinement and three spaced supports for engaging separated localities on the lowermost article, feed members slidable on the supports, and a reciprocating member upon which the feed members are pivoted.

26. A machine of the class described, hav-

ing in combination, a stationary support for an article, said support comprising spaced members adapted to engage separated localities on the article, and means for causing relative movement between the support and the article first in one direction and then in another to move the article through the space between the members.

27. A machine of the class described, having in combination, a support for an article, a plurality of feed members located on opposite sides of the article and positively operated means for causing relative movement between the support and members to free the article from the support.

28. A machine of the class described, having in combination, means including three spaced members for supporting an article, and means for manipulating the article to feed it through the space between the members.

29. A machine of the class described, having in combination, a support having three spaced members adapted to contact with an article at separated localities, a plurality of feed members, and means for causing the feed members to free the article first from certain of the supporting members and then from the remainder.

30. A machine for feeding warped blanks from a stack, having in combination, spaced members arranged to support the stack by engagement with points near two opposite edges of the lowermost blank whereby the locations of a plurality of points in the opposite edges of the lowermost blank are determined for each blank as it becomes the lowermost one irrespective of the manner in which the blank is warped, feed members, means for operating the feed members, and means for controlling the paths of the members to cause them to engage the lowermost blank at the determined locations.

31. A machine of the class described, having, in combination, means for holding a stack of blanks superposed in substantial alinement with one another, said means including three triangularly arranged spaced members held from movement with respect to one another, all located at substantially the same level and arranged to contact with the under face of the lowermost blank, and means for producing relative movement between the lowermost blank and the supporting members first in one direction and then in another to separate said blank from the stack.

32. A machine of the class described, having, in combination, means for holding a stack of blanks superposed in substantial alinement with one another, said means including three triangularly arranged spaced members held from movement with respect to one another, all located at substantially the same level and arranged to contact with the under face of the lowermost blank, and means for moving the lowermost blank first in one direction and then in another to free it from contact with the supporting members.

33. A machine of the class described, having, in combination, a magazine for holding a stack of blanks in substantial alinement with one another, a plurality of stationary members located to support the stack by engaging marginal portions of an end blank, said members being spaced apart a distance less than the corresponding dimension of the blank and means for manipulating the blank while maintaining it undistorted to feed it through the opening between the spaced supporting members.

34. A machine of the class described having, in combination, a magazine for holding a stack of blanks having immovable spaced supports for engaging one side of an end blank and thereby supporting the stack against movement through the magazine, a plurality of pushers arranged to engage alternately opposite edges of the end blank, and means for operating the pushers first to free the blank from one or more of the supports and then to free it from the remaining supports and permit it to pass bodily through the space between them.

35. A machine of the class described, having, in combination, a magazine for holding a stack of blanks having three separated supports for engaging the under side of the lowermost blank and thereby supporting the stack, a plurality of pushers, means for maintaining the pushers in a fixed spaced relation, and means for reciprocating the pushers in directions substantially transverse to the length dimension of the stack to move the lowermost blank first in one direction to free it from one or more of the supports and permit one end of it to fall between the supports and then in another direction to free it from the remaining supports and permit it to fall bodily between the supports.

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

CUTLER D. KNOWLTON.