Aug. 31, 1948. R. H. LAWSON 2,448,101

MACHINE FOR TURNING THE PLATFORM COVERS OF PLATFORM SHOES

Filed March 22, 1946 2 Sheets-Sheet 1

Fig. 1

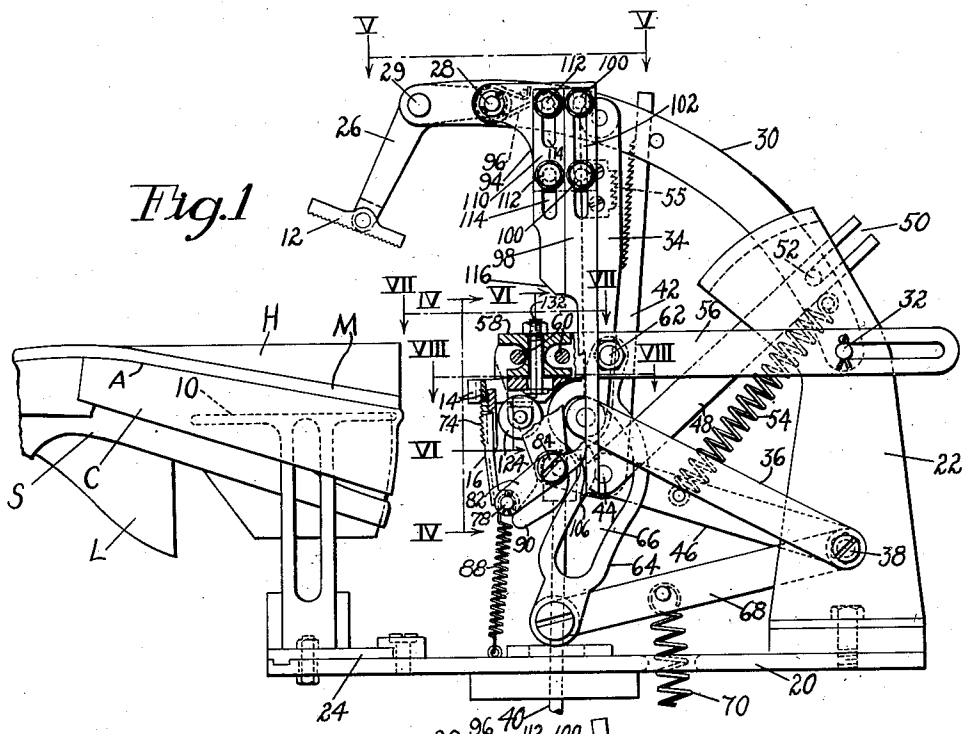
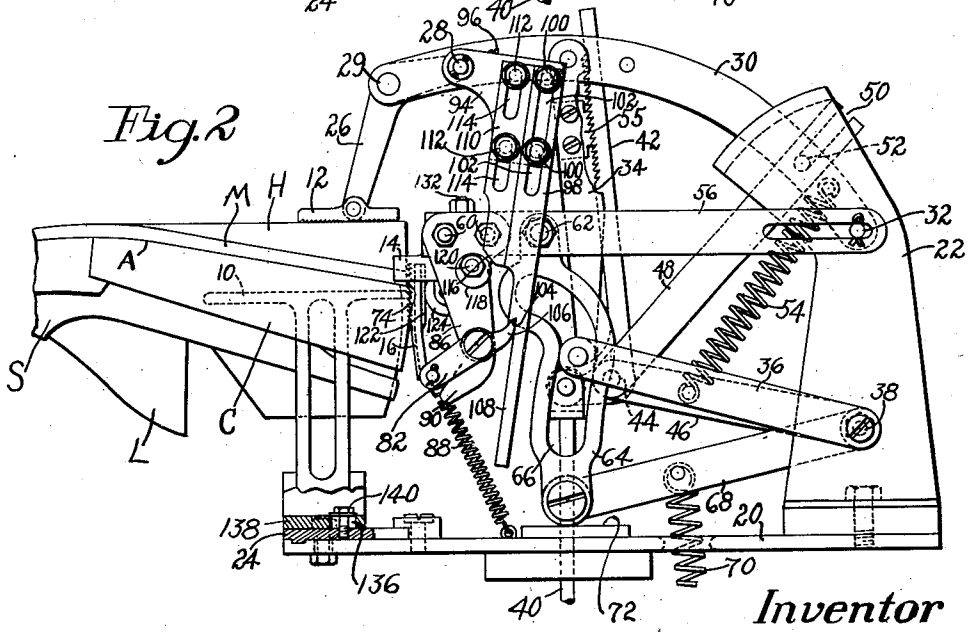


Fig. 2



Inventor

Robert H. Lawson

By His Attorney

Wm. H. Lawson

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Fig. 5

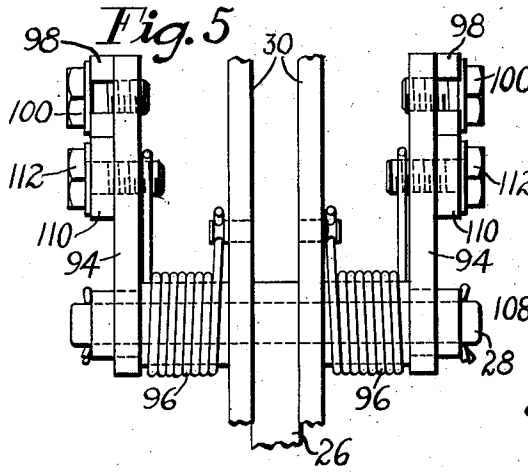


Fig. 4

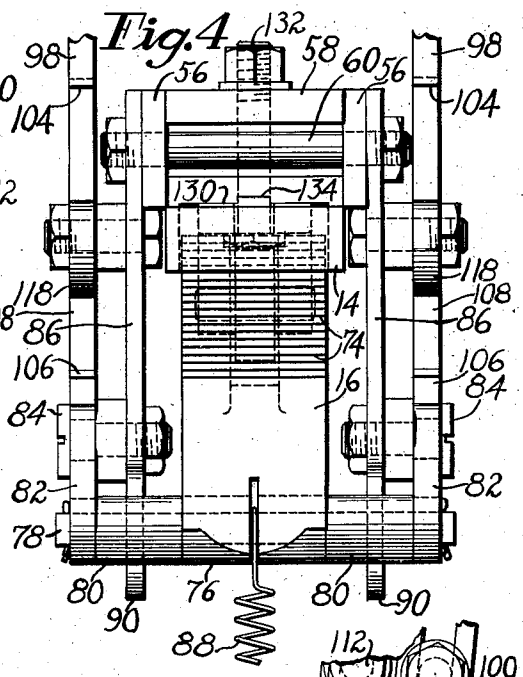


Fig. 6

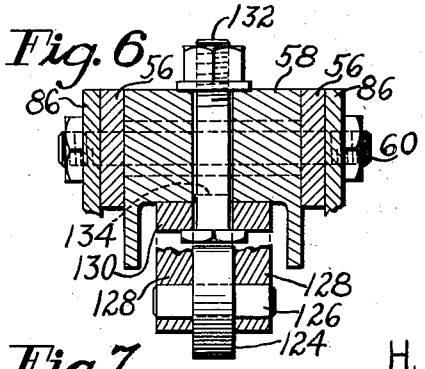


Fig. 7

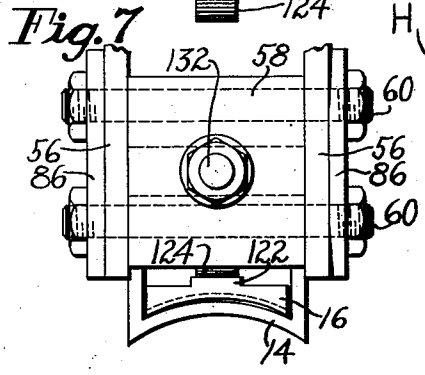


Fig. 8

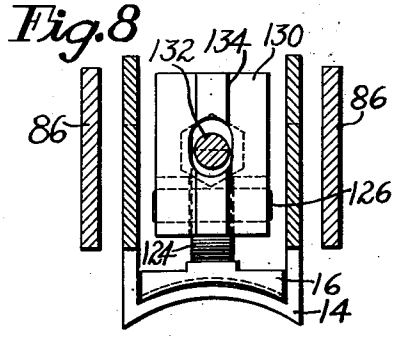
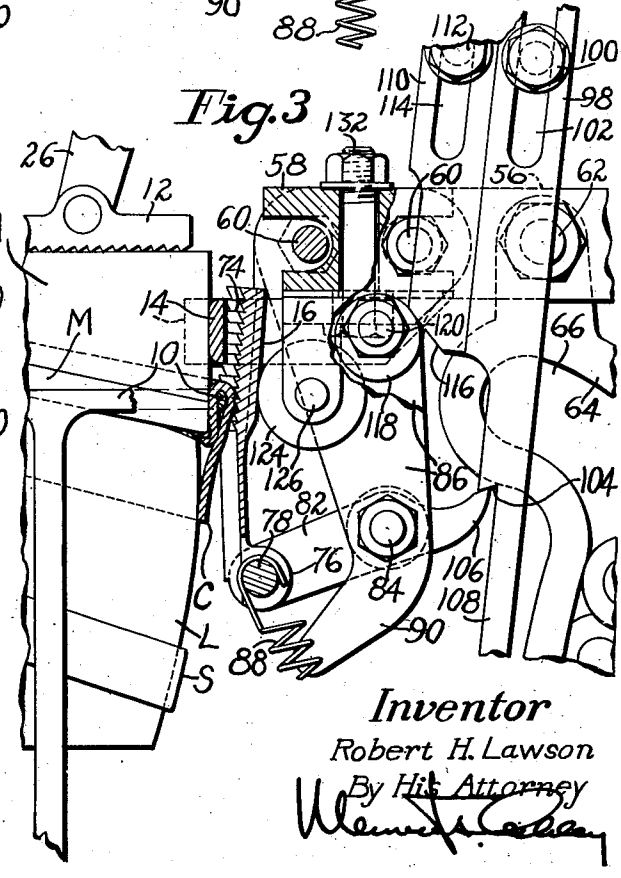


Fig. 3



Inventor

Robert H. Lawson

By His Attorney

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UNITED STATES PATENT OFFICE

2,448,101

MACHINE FOR TURNING THE PLATFORM COVERS OF PLATFORM SHOES

Robert H. Lawson, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application March 22, 1946, Serial No. 656,457

16 Claims. (Cl. 12—1)

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This invention relates to machines for turning the platform covers of platform shoes and is herein disclosed as embodied in a machine of the type illustrated and described in my copending application Serial No. 566,592, filed December 4, 1944, now U. S. Patent No. 2,422,737. That machine, like the one disclosed in the present application, is provided with a U-shaped turning tool adapted to fit around the end of an inverted shoe and to engage within the unturned platform cover. The turning operation is performed by urging the shoe downwardly into the U-shaped tool by means of a plunger operating against the shoe bottom. The machine disclosed in said prior application was provided with a tensioning device to adapt it to work upon platform covers of flimsy material, such as thin woven fabric. This tensioning device consisted of a snubber which pressed the platform cover against the turning tool while the operation was taking place. However, when the platform cover is made of relatively stiff material, such as leather, excessive tension is developed even without snubbing and unless such tension can be relieved, the covers are likely to become torn or otherwise damaged.

It is an object of the present invention to provide a platform cover turning machine suitable for turning platform covers of relatively stiff material, such as leather. In accordance with a feature of the invention, the illustrated machine is provided with a tool frictionally engageable with the cover to assist in turning the cover. This tool is operated in conjunction with the plunger above mentioned for urging the cover around the U-shaped turning tool. A somewhat similar friction tool is disclosed also in my copending application Serial No. 719,587, filed December 31, 1946.

These and other novel features of the invention are illustrated in the drawings and are hereinafter described and claimed.

Referring to the accompanying drawings,

Fig. 1 is a side elevation of the operating instrumentalities of the machine in normal position before depression of the treadle;

Fig. 2 is a view similar to Fig. 1, showing the shoe engaging instrumentalities in contact with the shoe and about to begin their operation;

Fig. 3 is an enlarged side elevation, partly in section, showing the shoe engaging members at the beginning of their operation;

Fig. 4 is a front elevation, as seen from the line IV—IV of Fig. 1, of some of the parts shown in Fig. 3;

Fig. 5 is a plan view, as seen from the line V—V

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of Fig. 1, of certain parts of the mechanism for operating the friction member;

Fig. 6 is a vertical section taken through the line VI—VI of Fig. 1.

Fig. 7 is a plan view of the friction member and also of the member which pushes the shoe forward; and

Fig. 8 is a horizontal section taken on the line VIII—VIII of Fig. 1.

Many of the parts of the illustrative machine are similar to corresponding parts of the machine shown in Figs. 18 and 19 of Letters Patent No. 2,422,737 already mentioned. The following description of these similar parts will therefore be brief, inasmuch as reference may be had to the prior application for a fuller understanding of their construction and operation.

The shoe engaging members of the illustrative machine comprise a heel turning tool 10, a toe turning tool (not shown), a shoe bottom engaging plunger 12, a tool 14 which serves to push a shoe forwardly during the operation, and a friction tool 16 which operates to assist the plunger 12 in turning a platform cover C of a shoe S over the tool 10. The shoe S, as shown herein, is mounted on a last L and it has a platform comprising a midsole M and a wedge heel H. The platform cover C is attached along one of its margins to the body portion of the shoe by a line of stitching which, in Figs. 1 and 2, appears to coincide with a line A representing the upper (as distinguished from the tread) surface of the midsole M. This line of stitching secures the platform cover to the usual sock lining which is attached to the midsole M and to the upper of the shoe. The supporting structure of the machine consists of a hollow column (not shown) adapted to rest upon the floor and a supporting shelf 20 which carries an upstanding bracket 22 in the form of a pair of spaced parallel plates. The heel and toe turning tools above mentioned are stationary while the operation is being performed, but they are mounted for movement to enable either to be moved into its operative position while the other is moved out of operative position. These tools are U-shaped or horseshoe shaped to enable them to fit around the respective ends of the shoe and they have their operative portions composed of resilient metal arranged in a substantially horizontal plane. These tools are mounted upon a slide 24 which is guided for sliding movement on the forward marginal portion of the shelf 20 to enable either tool to be brought into operating position.

The plunger 12 is carried upon a bent lever 26

fulcrumed for limited swinging movement on a pin 28 which extends between a pair of parallel arms 30. A pin 29, secured in the arms 30, extends through a hole in the lever 26 large enough to permit some degree of swinging movement of the lever. The arms 30 are pivoted for free swinging movement upon a pin 32 secured in the bracket 22. Pivotally connected to the arms 30 and depending therefrom are a pair of parallel links 34 the lower ends of which are pivotally connected to the forward ends of a pair of parallel links 36, the rear ends of the links 36 being pivotally mounted upon a pin 38 secured in the bracket 22.

The upper end of a treadle rod 40 is pivotally connected to a short, forwardly extending arm of a bell-crank lever 42, this bell-crank lever being fulcrumed upon a pin 44 which constitutes the pivotal connection between a pair of parallel links 46 and a pair of parallel bars 48. The rear ends of the links 46 are fulcrumed upon the pin 38 and the rear upwardly extending ends of the bars 48 are provided with slots 50 which engage a pin 52 carried by the arms 30. A tension spring 54 having one end anchored to the arms 30 and the other end anchored to the links 46 normally maintains the links 46 and thereby, through the bars 48, the arms 30 in upward position. Formed upon the bell-crank lever 42 are ratchet teeth which are engageable with a ratchet 55 carried by the links 34 to move the links 34 and thereby the arms 30 downwardly. Depression of the treadle, operating through the rod 40, serves to swing the bell-crank lever 42 into ratchet engaging position. However, during the initial portion of the downward movement of the treadle rod 40 the arms 30 will, for reasons fully explained in my prior application aforementioned, descend faster than the links 42 until the plunger 12 is arrested by engagement with the bottom of the platform of a shoe. Further downward movement of the treadle rod will now operate directly through the ratchet to draw the arms 30 downwardly and thereby depress the plunger, causing the platform cover to be turned over the tool 10.

The tool 14 serves to push the shoe forward for the purpose of enabling the platform to clear the turning tool 10 so that the shoe may descend within the tool 10. The tool 14 is mounted upon the forward end of a carrier consisting of a pair of parallel bars 56 having slotted rear portions which slide upon the pin 32. The tool 14 is concave to engage the curved end of the platform and is integral with a block 58 which is clamped between the parallel bars 56 by a pair of clamping bolts 60 passing through enlarged openings in the block 58 to permit adjustment. The bars 56 are also pivotally connected by a pin 62 to the upper ends of a pair of parallel cam plates 64 having cam slots 66. The lower ends of the cam plates 64 are pivotally connected to the forward end of a link 68 the rear end of which is pivotally mounted on the pin 38. A tension spring 70 yieldably holds the cam plates down with their lower ends resting upon a plate 72 mounted on the shelf 20. Cam rolls engaging the slots 66 are carried upon the pivotal connections between the links 34 and 36, the slots being so shaped as to give the pushing tool 14 the desired forward movement during the early part of the down stroke of the plunger 12.

The machine as thus far described is, with the exception of the friction tool 16, similar to the machine described in Letters Patent No. 2,422,737 already mentioned.

The friction tool 16 (Figs. 3 and 4) consists of a plate having a concave work engaging face across which extend upwardly directed ratchet teeth 74. The lower end of the tool 16 has a hub 76 which is supported on a pin 78 between a pair of spacer rolls 80. The pin 78 is secured in and extends between a pair of parallel levers 82 fulcrumed upon a pair of coaxial studs 84 carried by a pair of parallel plates 86. The clamping bolts 60 serve also to secure the plates 86 against the outer faces of the bars 56. A tension spring 88 having its lower end anchored in the shelf 20 and its upper end hooked to the pin 78 normally holds the friction tool 16 down in a stop position determined by the engagement of the spacer rolls 80 with a forward extension 90 on each of the plates 86.

Pivotally mounted upon the pin 28 are a pair of plates 94. Torsion springs 96 surrounding the pin 28 serve normally to urge the plates 94 in a clockwise direction, as viewed in Figs. 1 and 2. Extending downwardly from each of the plates 94 is a bar 98, each of the bars 98 being adjustably secured to the associated plate 94 by a pair of clamping screws 100 extending through a longitudinal slot 102 formed in the bar 98. Formed on each of the bars 98 is a shoulder 104 (Fig. 3) which engages a pointed, rearwardly extending tail 106 of its associated lever 82. It is evident that downward movement of the arms 30 will bring the shoulders 104 into engagement with the tails 106 and thereby rotate the levers 82 in a clockwise direction, raising the friction tool 16. Each of the bars 98 has a portion 108 extending downwardly below the shoulder 104 to provide a stop surface engageable with the associated lever 82 for limiting the clockwise movement of the plate 94 under the influence of the torsion spring 96. As shown in Fig. 3, the shoulders 104 are undercut, the planes of the surfaces of these shoulders which engage the tails 106 being substantially tangent to a circle having its center in the axis of the pin 28. The upward thrust of the tails 106 will not, therefore, tend to rotate the plates 94 about the pin 28.

Also secured upon each of the plates 94 is a plate 110 extending downwardly substantially parallel to the bar 98. Each plate 110 is secured to its associated plate 94 by a pair of clamping screws 112 extending through longitudinal slots 114 formed in the plate 110. The lower end portion of each plate 110 is formed to provide an inclined cam surface 116 which, as the plunger 12 continues its descent, will engage an eccentric disk 118 secured in each of the plates 86. A clamping bolt 120 secures its associated disk 118 in any desired position of adjustment upon its associated plate 86 and may be loosened to permit turning of the disk to cause earlier or later engagement with the cam surface 116. Upon the engagement of the cam surfaces 116 with the disks 118 the plates 94 and thereby the bars 98 will be swung in a counterclockwise direction against the force of the torsion springs 96, causing the shoulders 104 to disengage from the tails 106 and permitting the spring 88 to pull the tool 16 down.

The upper portion of the tool 16 is guided for heightwise movement in an opening formed in the tool 14. This opening permits some degree of swinging movement forwardly and rearwardly of the tool 16 about its supporting pin 78. On the back of the tool 16 is a rib 122 (Fig. 7) which may be backed by a roll 124 mounted to rotate idly upon a pin 126 (Fig. 8) secured in a pair of

ears 128 depending from a block 130. A clamping bolt 132 (Fig. 6) extending through the block 130 and the block 58 secures the block 130 to the block 58 for adjustment of its position forwardly and rearwardly. The block 130 (Fig. 6) has an upwardly extending tongue 134 engaging a groove in the under surface of the block 58 to position the block laterally. Forward adjustment of the roll 124 enables it to hold the friction tool 16 in operative position wherein the friction tool acts upon the platform cover of the shoe while the plunger 12 is being depressed. Rearward adjustment of the rool 124 by relieving the backing pressure against the tool 16 permits the tool 16 to swing idly away from the work piece.

In some cases it is undesirable to have the member 14 operate against the toe end of the shoe. To prevent such operation, the block 58 is adjusted rearwardly on the bars 56 and the heel turning tool 10 is adjusted rearwardly on the slide 24 to keep it within operating distance of the tool 14. When these adjustments have been made, the toe turning tool (not shown) will be too far forward of the tool 14 to be within operating distance of it. In such cases the forward component of thrust of the plunger 12 (explained in Letters Patent No. 2,422,737) still operates upon the toe end of the shoe. To enable the heel turning tool 10 to be adjusted rearwardly, a pair of parallel slots 136 (one of which is shown in Fig. 2) extending forwardly and rearwardly are formed in a base plate 138 which carries the tool 10. A pair of clamping screws 140 extending through the slots 136 and threaded into the slide 24 enable the tool 10 to be secured in any desired position of forward and rearward adjustment.

In the operation of the machine, depression of the treadle first causes a rapid descent of the plunger 12 to bring the plunger into engagement with the bottom of the platform of a shoe supported upon one of the turning tools, for example, the heel turning tool 10. The resistance which the plunger encounters upon engaging the shoe bottom causes the ratchet teeth on the lever 42 to engage the ratchet 55 and thereby causes the plunger to descend under the direct pull of the treadle rod. In the meanwhile, the cam 64, acting through the bars 56, has caused the tool 14 to advance into engagement with the end of the shoe and push the shoe forwardly to enable the platform to clear the turning tool 10 as it descends within the turning tool. The operation so far is similar to that of the machine already described in Letters Patent No. 2,422,737.

In the present machine the same movement of the bars 56 which advances the tool 14 into engagement with the end of the shoe serves also to advance the friction tool 16 into engagement with the platform cover. Any desired pressure of the friction tool against the cover can be obtained, regardless of the thickness of the cover, by adjustment forwardly or rearwardly of the block 130 which carries the backing roll 124. The area of the cover initially engaged by the tool 16 includes the portion of the cover adjacent to its attached margin, that is, adjacent to the stitching A. Now, while the shoe is being pushed down by the plunger 12 and while the friction tool 16 is held pressed against the cover, the descent of the arms 30 causes the shoulder 104 to engage the tail 106 of the lever 82 and thereby raise the friction tool heightwise of the shoe and toward the plane of the shoe bottom. The frictional force of the tool 16 thus exerted upon the cover tends to form the cover into a bight which begins at the

attached margin and progresses, relatively to the downwardly moving shoe, in the direction of movement of the tool 16. As the cover is thus turned by the joint action of the plunger 12 and friction tool 16, it is backed by the stationary U-shaped turning tool 10 which resists the pressure of the tool 16 and which fills the bight of the cover as the cover slides over it. The plunger 12, in pushing the body portion of the shoe down through the U-shaped tool 10, serves necessarily to prevent upward movement of the body portion of the shoe with the friction tool 16.

The bar 98 should be adjusted heightwise to cause the upward movement of the tool 16 to take place at about the same time the shoe begins to move downwardly under the action of the plunger 12. The duration of such upward movement of the tool 16 depends upon the heightwise adjustment of the plate 110 and also upon the adjustment of the eccentric disk 118, the latter being employed for purposes of fine adjustment. In some cases it is desirable to continue the upward movement of the tool 16 until the free edge of the platform cover has passed over the turning tool 10. In other cases, however, it is desirable to release the tool 16 before the platform cover has been fully turned because in some cases a slight tension applied during the latter stage of the turning operation is desirable. This tension may be obtained by adjusting the plate 110 downwardly to such a position as to cause it to disengage the shoulder 104 from the tail 106 at the desired instant, whereupon the inclined face of one of the teeth 74 of the tool 16 will bear downward under the influence of the spring 88 to snub the platform cover against the turning tool 10. Such snubbing action, while of no consequence if the spring 88 is moderately weak, may be intensified to any desired extent by using a stronger spring.

It will be observed that the bars 98, the plates 110, and the levers 82, and also the eccentric disks 118, are all in duplicate, requiring separate adjustments for the right and left sides of the machine. The duplication of these members is unnecessary so far as their function is concerned inasmuch as a single set on either side would be sufficient, the only purpose of such duplication being to obtain better balance.

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

1. A platform cover turning machine comprising a turning tool adapted to engage within an unturned platform cover of a shoe, a member engageable with the bottom of the shoe, means for effecting relative movement in a direction heightwise of the shoe between the turning tool and the bottom engaging member to turn the cover over the turning tool, and means acting upon the cover to assist in turning the cover.

2. A platform cover turning machine comprising a turning tool adapted to engage within an unturned platform cover of a shoe, a member engageable with the bottom of the shoe, means for effecting relative movement in a direction heightwise of the shoe between the turning tool and the bottom engaging member to turn the cover over the turning tool, and means frictionally engageable with the cover to assist in turning the cover.

3. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger en-

gageable with the bottom of the shoe, a friction tool engageable with the cover outside the turning tool, and means for depressing the plunger to urge the shoe downwardly to cause the cover to be turned over the tool and for raising the friction tool while the cover is being turned to cause the friction tool to urge the cover upwardly and thereby assist in the turning operation.

4. A platform cover turning machine comprising a generally U-shaped turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, a concave friction tool engageable with the cover outside the turning tool, and operating means constructed and arranged to move the plunger and thereby the shoe downwardly to cause the cover to be turned over the turning tool, said operating means being also constructed and arranged to move the friction tool upwardly in engagement with the cover to relieve strain in the cover as it turns over the turning tool.

5. A platform cover turning machine comprising a generally U-shaped turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, a concave friction tool engageable with the cover outside the turning tool, operating means constructed and arranged to move the plunger and thereby the shoe downwardly to cause the cover to be turned over the turning tool, said operating means being also constructed and arranged to move the friction tool upwardly in engagement with the cover to relieve strain in the cover as it turns over the turning tool, and means for varying the time during which the friction tool acts on the cover.

6. A platform cover turning machine comprising a generally U-shaped turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, a concave friction tool engageable with the cover outside the turning tool, operating means constructed and arranged to move the plunger and thereby the shoe downwardly to cause the cover to be turned over the turning tool, said operating means being also constructed and arranged to move the friction tool upwardly in engagement with the cover to relieve strain in the cover as it turns over the turning tool, and means for varying both the time of engagement and the time of release of the friction tool.

7. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover at one end of an inverted shoe, a plunger engageable with the bottom of the shoe, a friction tool engageable with the cover outside the turning tool, a carrier upon which said friction tool is mounted for heightwise movement, a support upon which said carrier is mounted for movement toward and from the shoe in a direction lengthwise thereof, and operating means constructed and arranged to depress the plunger to urge the shoe downwardly and thereby cause the cover to be turned over the turning tool, said operating means being also constructed and arranged to move said carrier toward the shoe and to move the friction tool upwardly on the carrier, the movement of the carrier serving to bring the friction tool into engagement with the platform cover and the upward movement of the friction tool serving to relieve the platform cover of strain as it turns over the turning tool.

8. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe at one end of the shoe, a plunger engageable with the bottom of the platform of the shoe at that end of the shoe, a lever upon which said plunger is mounted, means for swinging the lever downwardly to depress the plunger and thereby the shoe to cause the cover to be turned over the tool, a member engageable with the edge surface of the platform at said end of the shoe, a carrier for said member, a support upon which said carrier is mounted for movement in a direction lengthwise of the shoe, cam means constructed and arranged upon downward swinging of the lever to move the carrier lengthwise of the shoe to cause said member to push the shoe forward far enough to enable the portion of the platform extending over the tool to clear the tool, and friction means on said carrier for urging the platform cover over the turning tool to assist the plunger in turning the platform cover.

9. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, an arm on which said plunger is mounted, means for depressing the arm and thereby the plunger to urge the shoe downwardly to cause the cover to be turned over the tool, a friction tool engageable with the cover outside the turning tool, and mechanism operated by said arm for raising said friction tool in frictional engagement with the cover to urge the cover upwardly and thereby assist in the turning operation while said arm is being depressed.

10. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, an arm on which said plunger is mounted, means for depressing the arm and thereby the plunger to urge the shoe downwardly to cause the cover to be turned over the tool, a friction tool engageable with the cover outside the turning tool, a spring normally holding said friction tool down, a lever by which said friction tool may be raised, and a bar mounted on said arm for engaging said lever to raise the friction tool when the arm is depressed.

11. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engageable with the bottom of the shoe, an arm on which said plunger is mounted, means for depressing the arm and thereby the plunger to urge the shoe downwardly to cause the cover to be turned over the tool, a friction tool engageable with the cover outside the turning tool, a spring normally holding said friction tool down, a lever by which said friction tool may be raised, a bar mounted on said arm for engaging said lever to raise the friction tool when the arm is depressed, and means for securing said bar to said arm in various positions of heightwise adjustment to enable the time of the engagement of the bar with the lever to be varied.

12. A platform cover turning machine comprising a stationary turning tool adapted to engage within a downwardly extending unturned platform cover of an inverted shoe, a plunger engage-

able with the bottom of the shoe, an arm on which the plunger is mounted, means for depressing the arm and thereby the plunger to urge the shoe downwardly to cause the cover to be turned over the tool, a friction tool engageable with the cover outside the turning tool, mechanism operated by said arm for raising said friction tool in frictional engagement with the cover to urge the cover upwardly and thereby assist in the turning operation while said arm is being depressed, and a member secured on said arm with provision for heightwise adjustment thereon, said member being constructed and arranged to disengage said raising mechanism and thereby terminate the operation of the friction tool at a stage of the turning operation predetermined by the heightwise adjustment of said member.

13. In a platform cover turning machine, means for turning an unturned platform cover attached along one of its margins to the body portion of a shoe, comprising a friction tool engageable with the unturned cover at a locality adjacent to said attached margin, and means for effecting relative movement between the tool and the shoe to cause the tool to exert upon the cover a frictional turning force which is directed heightwise of the shoe and toward the plane of the shoe bottom.

14. In a platform cover turning machine, a support for a shoe having an unturned platform cover attached along one of its margins to the body portion of the shoe, a friction tool engageable with the unturned cover, means for bringing said tool into engagement with the cover at a locality adjacent to said attached margin, means for moving the friction tool in a direction which is heightwise of the shoe and toward the plane of the shoe bottom to cause the tool to exert upon the cover a frictional turning force tending to form the cover into a bight which begins at said attached margin and progresses relatively to the shoe in said directions as the platform cover is turned, and means for preventing movement of the body portion of the shoe with the friction tool.

15. In a platform cover turning machine, a support for a shoe having an unturned platform cover attached along one of its margins to the body portion of the shoe, a tool having ratchet teeth for frictional engagement with the unturned cover at an end of the shoe, means for bringing said tool into initial engagement with the cover at a locality adjacent to said attached margin, means for moving the tool in a direction which is heightwise of the shoe and toward the plane of the shoe bottom, thereby causing the tool to exert upon the cover a frictional force tending to form the cover into a bight which begins at said attached margin and progresses relatively to the shoe in said direction as the platform cover is turned, and a member engageable with the shoe bottom to prevent the body portion of the shoe from moving with the friction tool.

16. In a platform cover turning machine, a tool adapted to engage within an unturned platform cover attached to the body portion of a shoe, a friction tool engageable with the exposed surface of the unturned cover, means for pressing the friction tool against said exposed surface where the cover is backed by the first-mentioned tool, means for moving the friction tool in a direction which is heightwise of the shoe and toward the plane of the shoe bottom to cause the friction tool to exert upon the cover a frictional force tending to turn the cover by sliding it over the first-mentioned tool, and means for preventing movement of the body portion of the shoe with the friction tool.

ROBERT H. LAWSON.

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