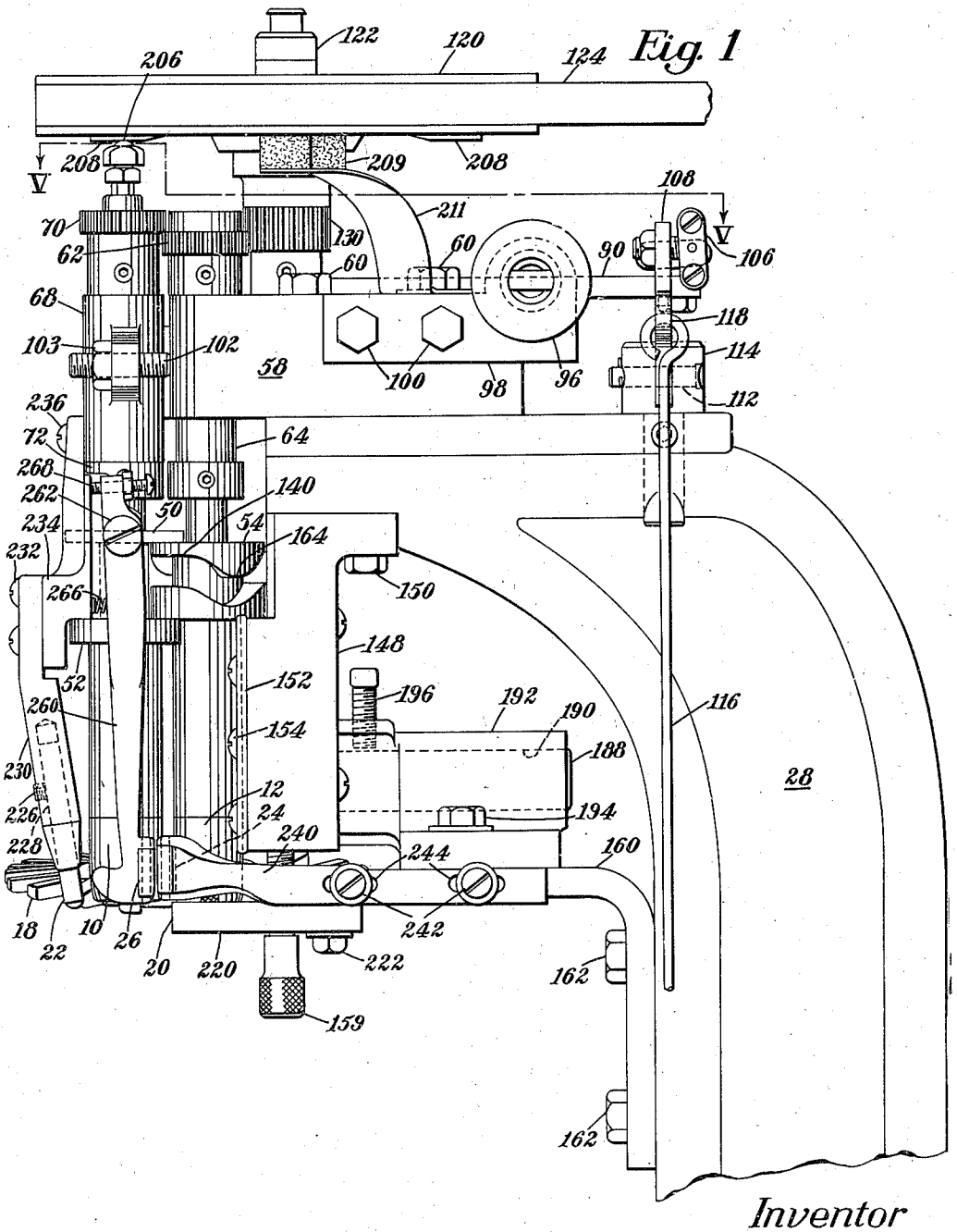
March 1, 1949. C. G. BROSTROM 2,463,017

LASTING MACHINE

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Fig. 1



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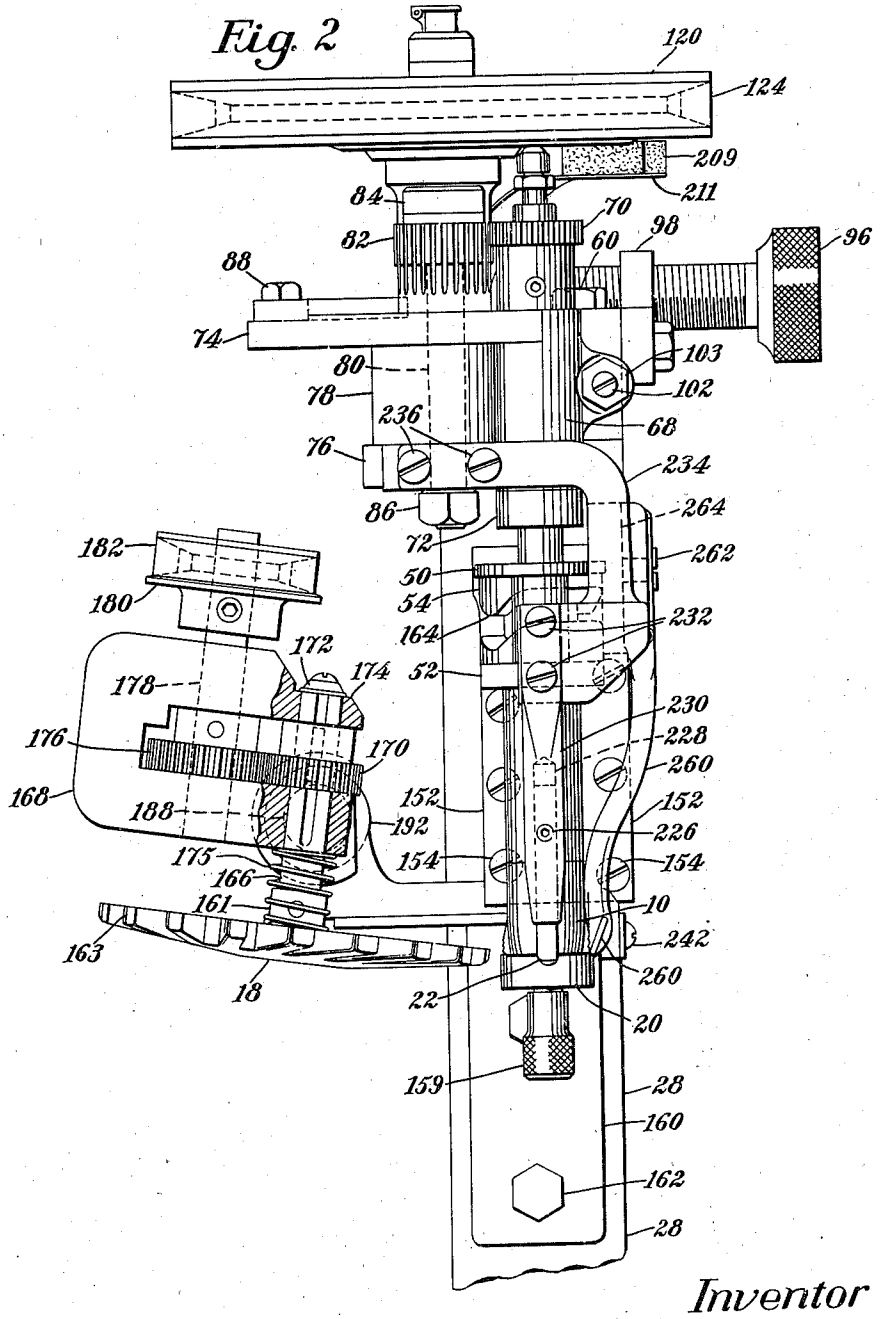
By his Attorney

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LASTING MACHINE

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Fig. 2



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LASTING MACHINE

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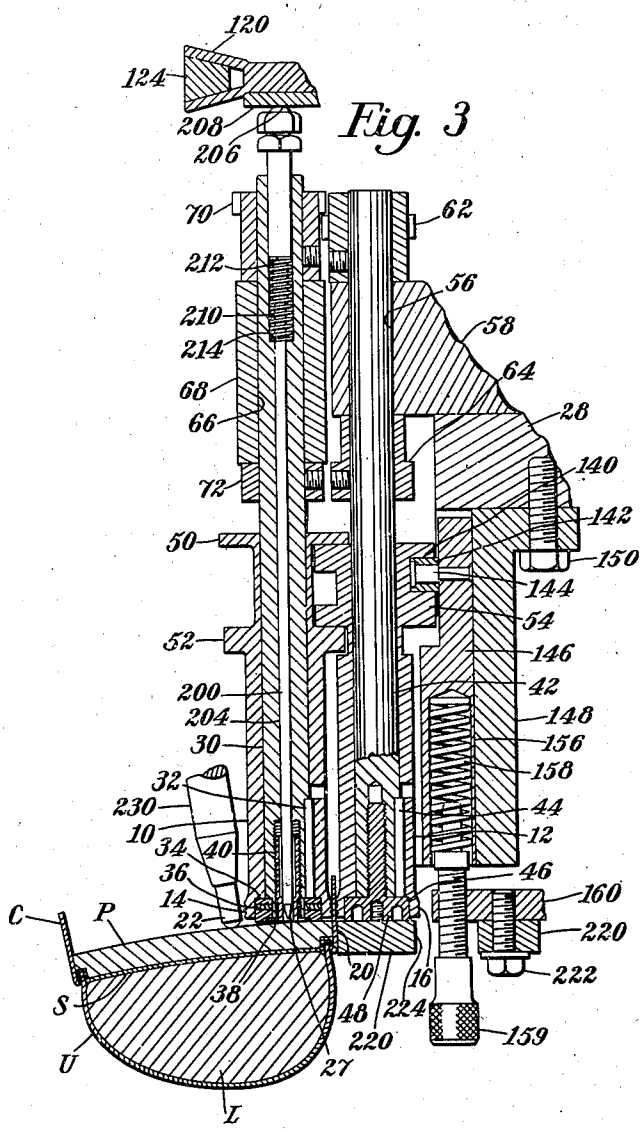


Fig. 3

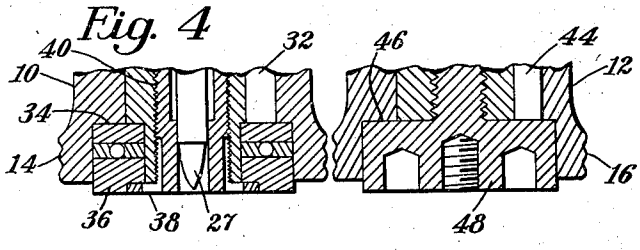


Fig. 4

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LASTING MACHINE

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Fig. 5

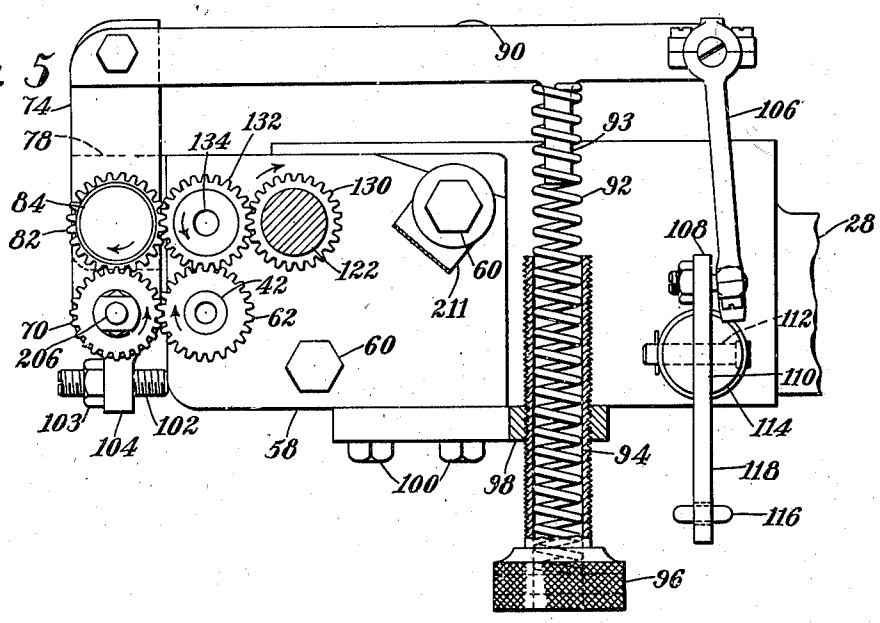
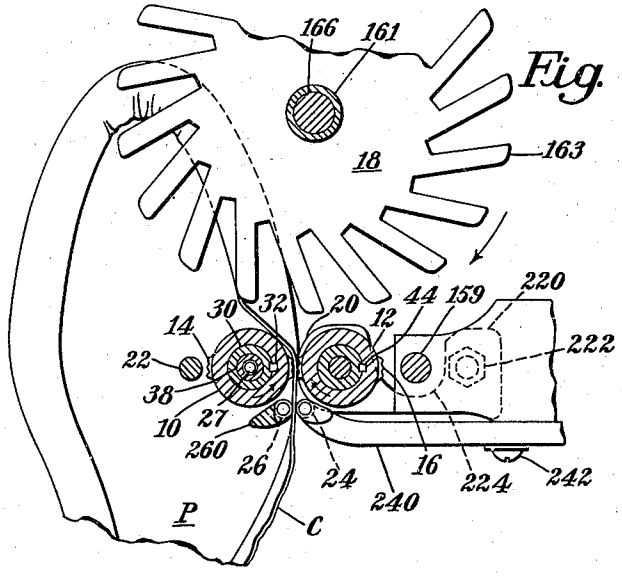


Fig. 6



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Patented Mar. 1, 1949 2,463,017

UNITED STATES PATENT OFFICE

2,463,017

LASTING MACHINE

Charles G. Brostrom, Lynn, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application October 25, 1946, Serial No. 705,597

28 Claims. (Cl. 12—1)

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This invention relates to lasting machines, and is herein illustrated as embodied in a machine for lasting with an adhesive. However, it is to be understood that features of the invention are not necessarily limited to use in machines for lasting with an adhesive or in a machine of the exact construction herein disclosed.

A principal object of the invention is to provide a machine for lasting with an adhesive which is of relatively simple and inexpensive construction, easy to operate and yet dependable and efficient in action. With this end in view, and in accordance with a feature of the invention, the herein illustrated machine has novel and improved means for tensioning the stock to be lasted which are also operable to impart a stress on the stock in a direction tending to feed a shoe. More particularly, the novel tensioning and feeding means comprise a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, and means for rotating and moving these members axially so as to cause the gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each portion, to move axially and rotate thereby to tension the stock, heightwise of the shoe, and to exert a stress thereon tending to feed the shoe. Preferably, and as herein illustrated, these members are moved in an axial direction through mechanism including a spring so that a yielding pull is applied and a uniform tensioning of the stock assured. Means are also provided for adjusting this spring in order to vary the strength of the pull and adapt it to the particular material being lasted. Yieldable means are utilized for moving the aforementioned tensioning and feeding members toward each other to cause the projections thereon to grip the lasting margin of stock, and means are provided for separating these members, against the action of the aforementioned yieldable means, to facilitate the introduction of the stock at the beginning of a lasting operation.

For preventing inadvertent movement of the shoe during intervals between the aforementioned tensioning and feeding actions and while the grip on the stock is released, the herein illustrated machine is, in accordance with a further feature of the invention, provided with means, operating in time relation to the above-mentioned tensioning and feeding means, for engaging the bottom of a shoe to hold it against movement in the direction of feed. More particularly, this means comprises a pricker point, associated with one of the rotatable and axially movable members, together with means for periodically projecting the pricker point into the shoe bottom.

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During the operation of the machine, the shoe is guided and positioned in a widthwise direction relative to the tensioning and feeding means by means of an edge gage and is held against movement in a heightwise direction, in response to the tensioning applied to the stock being lasted, by means engaging the bottom of the shoe. In the herein illustrated machine, the last-mentioned means comprises a shoe-bottom rest and an anti-friction thrust bearing associated with one of the rotatable and axially movable members. As the stock is tensioned, and the shoe fed along, by the axially movable and rotatable members, the lasting margin of the tensioned stock is wiped in over, and pressed against, the bottom of the shoe by means of a continuously operating rotary wiper. For guiding the lasting margin of the stock, and directing it between the rotatable and axially movable tensioning and feeding members, the herein illustrated machine is, in accordance with a further feature of the invention, provided with means for engaging the opposite sides of the stock. Preferably, this means comprises a pair of anti-friction rollers arranged adjacent to the tensioning and feeding means and yieldably urged into contact with the stock.

The above and other objects and features of the invention will be apparent from the following detailed description of a preferred embodiment thereof illustrated in the accompanying drawings, and will be pointed out in the claims.

In the drawings,

Fig. 1 is a view, in side elevation, of a machine embodying the features of the invention;

Fig. 2 is a view, in front elevation, of the machine shown in Fig. 1;

Fig. 3 is a view, in vertical section, showing certain of the operating elements of the machine shown in Fig. 1;

Fig. 4 is a view, in vertical section and on an enlarged scale, of portions of the operating elements illustrated in Fig. 3;

Fig. 5 is a plan view of the machine, with certain parts in section, on the line V—V of Fig. 1; and

Fig. 6 is a plan view showing the operating elements of the machine only, with certain of these elements shown in section, and illustrating the mode of operation of the machine.

Referring now to the drawings, the operating elements of the machine illustrated therein com-

prise a pair of rotatable and axially movable, tensioning and feeding members 10, 12, each provided, respectively, with gripping portions formed by circumferentially spaced projections 14 and 16 and a rotary wiper 18. During the operation of the machine, the shoe is positioned, in a widthwise direction, by means of an edge gage 20 and is held against heightwise movement, in response to the tension applied to the stock being lasted, by means of a shoe-bottom rest 22 and a thrust bearing associated with member 10, while the lasting margin of the stock is guided and directed between the tensioning and feeding members 10 and 12 by means of anti-friction guide rollers 24, 26, see Fig. 6. A pricker point 27 is also provided for holding the shoe against movement, in the direction of feed, during the intervals between the tensioning and feeding actions of the rotatable and axially movable members 10 and 12. The aforementioned operating elements of the machine are supported on the upper end of a cast column 28 which is provided with a lower base portion, not shown. Preferably, the column is of suitable height to rest on a bench and bring the operating elements of the machine to the proper level, but, if desired, it may be higher and adapted to have its base portion rest on the floor.

Referring now particularly to Figs. 3 and 4, the manner in which the members 10 and 12 are rotated and moved axially, for tensioning the stock and exerting a stress thereon for feeding the shoe, will be described. The member 10 is formed as an elongated sleeve that is axially slidable on a shaft 30 to which it is drivingly connected by means of a key 32. At its lower end, the member 10 is formed with a shoulder 34 that engages an anti-friction thrust bearing 36, when the parts are in the positions shown in these figures. This thrust bearing is secured to the lower end of the shaft 30 by means of the head of a hollow screw 38 that is threaded into a bore 40, formed in said shaft. The member 12 is likewise formed as an elongated sleeve that is axially slidable on a shaft 42 to which it is drivingly connected by means of a key 44. The lower end of the member 12 is provided with a shoulder 46 that engages the head of a thrust screw 48 which is threaded into the lower end of this shaft. The upper end of the member 10 is provided with spaced flanges 50, 52 which embrace a cam member 54 formed integrally with the upper end of the member 12.

The shaft 42 is journaled in a bearing bore 56, formed in a block 58 that is secured to the upper end of the column 28 by means of screws 60, 60, see Fig. 5, and is held against axial movement in this bore by means of a gear 62 and a collar 64, each secured to the shaft by setscrews. The shaft 30 is journaled in a bore 66, formed in a bearing block 68, and is held against axial movement therein by means of a gear 70 and a collar 72, each secured to this shaft by setscrews. The bearing block 68 has extending therefrom two arms 74 and 76, which are rotatably mounted on a forwardly extending portion 78 of the block 58 by means of a stud 80, which passes through these arms, the extending portion 78, and also through an idler gear 82 that is supported on the top of the arm 74, see Fig. 2. This stud has a head 84 which is held against the gear 82 by means of a nut 86. Secured to the end of the arm 74, by means of a screw 88, and extending at right angles thereto, is a bar 90 by means of which the arms 74 and 76 may be swung, about

the axis of the stud 80, to separate the members 10 and 12.

The members 10 and 12 are normally urged yieldingly toward each other, as shown in Figs. 3 and 6, by means of a compression spring 92, see Fig. 5. One end of this spring surrounds a projection 93, on the bar 90, while the other end is received in a bore 94, formed in an adjusting screw 96, threaded through an ear 98 that is secured to the block 58 by means of screws 100. A stop screw 102, threaded through an extension 104 of the arm 74, bears against the block 58 to prevent actual contact of the projecting portions 14 and 16 on the members 10 and 12, and a lock nut 103 is provided for holding the screw 102 in adjusted position.

For separating the members 10 and 12, to facilitate the entry of the lasting margin of the stock to be lasted therebetween, the following mechanism is provided. A link 106 is connected to the bar 90 and also to one arm 108, of a bell-crank lever 110, pivotally mounted on a pin 112 that is carried by a block 114 on the column 28, Fig. 5. A treadle rod 116, connected to another arm 118, of the bell-crank lever 110, extends downwardly to a treadle, not shown. When the treadle is depressed, the arms 74 and 76 are swung, in a clockwise direction, Fig. 5, about the axis of stud 80 and against the action of the spring 92, thereby to separate the members 10 and 12. Upon release of the treadle, spring 92 yieldingly moves these members toward each other to the extent permitted by the setting of the stop screw 102.

The members 10 and 12 are rotated by means of a pulley 120, which is journaled on a stud 122, secured to the block 58, and driven by a belt 124, in the following manner. A gear 130, connected to this pulley, meshes with a gear 132 which is journaled on a stud 134 carried by the block 58. The gear 132 meshes with the gear 62, secured to the shaft 42, and also with the idler gear 82, which latter gear meshes with the gear 70 secured to the shaft 30. The arrangement is such that, when the pulley 120 is driven by the belt 124 so as to turn the gear 130 in the direction shown by the arrow in Fig. 5, gears 70 and 62, together with members 10 and 12 will be rotated oppositely and in the direction shown by the arrows in this figure. Referring now to Fig. 6, the projections 14 and 16, on the members 10 and 12 respectively, are circumferentially spaced 180° apart, and the angular relationship of these members in such that their projections cooperate, in succession, to grip and release different portions of the lasting margin of the stock as these members rotate. When the members 10 and 12 are separated, by the depression of the treadle as above explained, the gear 70 moves out of mesh with the gear 62. However, the gear 70 also revolves around the common axis of the stud 80 and in mesh with the gear 82. Hence, when the treadle is released, the gear 70 will again mesh with the gear 62 without disturbing the angular relationship of the members 10 and 12.

For moving the members 10 and 12 axially, while the cooperating projections 14 and 16 thereon are in gripping engagement with the stock in the manner shown in Figs. 3 and 6, the cam 54 is utilized. This cam has a groove 140 in which rides a roller 142 journaled on a pin 144 carried by a slide 146, Fig. 3. This slide is mounted in a bracket 148, secured to the column 28 by screws 150, and is held in place by means

of cover plates 152 and screws 154, see Figs. 1 and 2. Received within a bore 156, in this slide is a compression spring 158, the lower end of which rests on an adjusting screw 159. This adjusting screw is threaded through the front end of an angle bracket 160 which is secured to the column 28 by means of screws 162, Fig. 1. The cam groove 140 is shaped to provide two lift portions 164, and when these portions engage the roller 142, the members 10 and 12 will be elevated, yieldingly against the action of the spring 158. It will be understood that the upward movement of the cam 54 is transmitted to the member 10 by means of the flanges 50 and 52. These lift portions of the cam groove 140 are so positioned that the elevation of the members 10 and 12 will occur during the time that the cooperating projections are in engagement with the stock. As the members 10 and 12 rotate beyond the position shown in Fig. 6, and so that the grip of the projections 14 and 16 on the stock is terminated, and the stock released, the members 10 and 12 are lowered, by the cam 54, to the position shown in Figs. 3 and 4.

These actions are repeated, twice for each revolution of the members 10 and 12, so that stock introduced between these members, e. g., the lasting margin of the cover C of a platform shoe comprising an upper U, sock lining S and platform P, assembled on a last L, is first gripped by cooperating projections 14 and 16 on members 10 and 12, then tensioned vertically by these members as they are moved axially by the cam 54, with a yielding pull due to the action of the spring 158, and simultaneously is stressed in a direction to feed the shoe by the rotation of these members. While, in the herein illustrated machine, the members 10 and 12 are shown as provided with two projections, 14, 14 and 16, 16, respectively, it is to be understood that a larger number of projections may be provided and the cam groove 140 appropriately modified, if desired. Also the circumferential extent of the projections 14 and 16, which are shown as provided with roughened faces to augment their gripping action, may be increased to prolong their grip on the stock.

As the stock is thus tensioned and the shoe fed along, by the rotatable and axially movable members 10 and 12, the lasting margin thereof is wiped inwardly over, and pressed against, the bottom of the shoe, e. g., the bottom face of the platform P, by the rotary wiper 18. It will be understood that the inside face of the cover C and/or the bottom face of the platform P have been previously coated with adhesive so that the lasting margin of the tensioned stock will be secured in lasted position to the platform P. The wiper 18, which is similar in construction to that disclosed and claimed in United States Letters Patent No. 2,397,369, issued on March 26, 1946, in the name of E. Quinn et al., comprises a hub 161 from which extend a circumferential series of inclined teeth 163, the lower faces of which are elements of a very flat cone. The hub 161 is secured to a shaft 166 which is journaled in a housing 168. This shaft is slidable in, and keyed to, a gear 170 and is yieldingly urged downwardly, to the extent permitted by a cap screw 172, bearing against a surface 174 on the housing, by means of a compression spring 175, see Fig. 2. The gear 170 meshes with a gear 176, secured to a shaft 178, also journaled in the housing. The shaft 178 is driven, by means of a pulley 180 and a belt 182, so as to rotate the wiper in the direction of the arrow, Fig. 6, and at a relatively high speed. As is explained in the above-mentioned patent, the leading edges of the teeth 163 on the wiper 18 extend at an angle to their line of movement so that a wiping action having a component of movement in the direction of feed is provided. As shown in Fig. 2, the wiper 18 is arranged to rotate about an axis inclined to the plane of the shoe bottom and so positioned, by cap screw 172 that its operating face is slightly below the level of the bottom of a shoe held up against the shoe-bottom rest 22 and the bottom of the thrust bearing 36 in the manner illustrated in Fig. 3. Accordingly, during the lasting operation the spring 175 is somewhat compressed and a yielding wiping pressure obtained.

The housing 168 is supported for angular movement, to permit adjustment of the wiper 18, in the following manner. A cylindrical portion 188 of this housing extends rearwardly therefrom and is rotatably mounted in a bore 190 formed in a block 192 that is secured to the angle bracket 160 by screw 194, Fig. 1. A setscrew 196 is arranged to bear against the projection 188 thus to hold the housing 168, together with the wiper 18, in adjusted position.

For holding the shoe against inadvertent movement by the operator in the direction of feed, during the intervals between successive actions of the projections 14 and 16 of the members 10 and 12, the pricker point 27 is provided. This pricker point is formed on the lower end of a rod 200 that is slidably mounted in a bore 204, formed in the shaft 30, see Fig. 3. At its upper end, this rod carries an anti-friction ball 206 which is held upwardly against a face cam 208, on the pulley 120, by means of a coil spring 210. This spring is interposed between a shoulder 212, on the rod 200, and a shoulder 214, formed on the shaft 30 by an enlargement of the bore 204 therein. The cam 208 is suitably shaped so as to project the rod 200 downwardly thus to drive the pricker point 27 into the shoe-bottom member, e. g., the platform P, just as the grip of projections 14 and 16 on the lasting margin of the stock is released, and to permit the spring 210 to elevate the rod, and withdraw its pointed end from engagement with the shoe-bottom member, just as the next two projections 14 and 16 are about to grip the stock. Accordingly, the shoe is positively held against movement in the direction of feed while the grip on the stock is released, yet is free to move during the tensioning and feeding actions of the rotatable and axially movable members 10 and 12. A felt pad 209 is provided for lubricating the cam 208. This pad is yieldingly pressed against the cam 208 by means of a spring finger 211 on which it is mounted. The finger 211 is secured to the top of the block 58 by means of one of the screws 60, see Figs. 1 and 3.

The edge gage 20 is formed by a rounded end on a bar 220. This bar is secured to the underside of the angle bracket 160 by means of a screw 222, see Figs. 3 and 6, and is shaped at 224 to provide clearance for the adjusting screw 159. The shoe-bottom rest 22 is adjustably secured, by a setscrew 226, in a bore 228 formed in the lower end of an elongated rod 230. The rod 230 is secured, by means of screws 232, to a U-shaped bracket 234, and this bracket is secured to the arm 76 by means of screws 236, see Figs. 1 and 2.

As suggested above, the lasting margin of the stock, e. g., the cover C, is guided and directed between the rotatable and axially movable mem-

bers 10 and 12 by means of the anti-friction rollers 24 and 26. The roller 24 is mounted in the end of a finger 240 which is adjustably mounted on the angle bracket 160 by means of screws 242, 242, which pass through slots 244, 244, in the finger, see Fig. 1. The roller 26 is mounted on the lower end of an arm 260 which is pivotally supported, by means of a stud 262, in a rearwardly projecting portion 264 formed on the U-shaped bracket 234, see Figs. 1 and 2. A compression spring 266, interposed between this arm and the bracket 234, tends to swing the arm about the stud 262 in a direction to move the roller 26 toward the roller 24, yieldingly and to the extent permitted by the setting of a stop screw 268. By adjusting this stop screw, the clearance space between these two rollers may be varied. As will be readily understood, the roller 26 will be moved away from the roller 24 when the members 10 and 12 are separated, by the depression of the treadle as above explained. Also, the roller 26 may yield away from the roller 24 to accommodate different thicknesses of the stock. Usually, and as herein illustrated, the stop screw 268 is so adjusted that the rollers 24 and 26 nearly touch each other so that a yielding pressure is applied to the lasting margin of the stock as it passes between the rollers 24 and 26.

While the operation of the machine may be readily understood from the foregoing description, it will now be briefly summarized. With the treadle depressed and the members 10 and 12 separated, the shoe is presented to the machine with its bottom face held up against the shoe-bottom rest 22 and the lower face of the bearing 36, its side face against the edge gage 20, and with the lasting margin of the stock to be lasted positioned between the members 10 and 12, as well as between the rollers 24 and 26. The treadle is then released, to permit the spring 92 to move the member 10 yieldingly toward the member 12. As these members rotate and are moved axially, different portions of the lasting margin will be gripped and released, successively, by the projections 14, 16 and each portion will be tensioned, heightwise of the shoe, by the axial movement of the members and the shoe fed along by the stress imposed on the stock due to the rotation of these members. Between these tensioning and feeding actions, and while the stock is released, the shoe will be held against movement, in the direction of feed, by the pricker point 27. The lasting margin of the tensioned stock is wiped inwardly over and pressed yieldingly against the bottom of the shoe by the continuously operating rotary wiper 18. It will be understood that, as the lasting operation proceeds, the shoe upheld in the hands of the operator is guided by the edge gage 20. At the conclusion of the lasting operation, which may be continued around the entire periphery of the shoe bottom, as is usually the case with a platform shoe of the type illustrated herein, or along a portion only of the periphery of the shoe bottom, as may be desired when lasting the upper of conventional shoes, the treadle is depressed to separate the members 10 and 12 thus to terminate their tensioning and feeding actions. That portion of the lasting margin of the stock, which has just been tensioned by the members 10 and 12, may now be wiped in over and pressed against the shoe bottom, by moving the shoe along manually while holding it up against the rotating wiper 18. While the herein illustrated machine is particularly well adapted for performing the

so-called "platform cover lasting operation," it is, as suggested above, equally well fitted for use in lasting the uppers of conventional shoes. Accordingly, in this specification and in the appended claims, the term "lasting" is used in a broadened sense and is intended to include not only the conventional lasting operation but also the analogous cover lasting operation, while the terms "lasting margin" and "lasted margin" are intended to include that portion of a platform cover which corresponds to the like portion of the upper stock of a conventional shoe.

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

1. In a lasting machine, a pair of rotatably and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe.

2. In a lasting machine, a pair of rotatably and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while so gripping each of said portions, to move yieldingly in an axial direction and to rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe.

3. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, and means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe.

4. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move yieldingly in an axial direction and to rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe.

5. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe.

6. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different

portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move yieldingly in an axial direction and to rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe.

7. In a lasting machine, a pair of rotatably and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe, and means adjacent to said members for wiping the lasting margin of the tensioned stock down on, and for pressing it against, the bottom of the shoe.

8. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means adjacent to said members for wiping the lasting margin of the tensioned stock down on, and for pressing it against, the bottom of the shoe.

9. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means adjacent to said members for wiping the lasting margin of the tensioned stock down on, and for pressing it against, the bottom of the shoe.

10. In a lasting machine, a pair of rotatably and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe, and means operating in time relation to the tensioning and feeding actions of said members for holding the shoe against movement in a lengthwise direction.

11. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means operating in time relation to the tensioning and feeding actions of said members for holding the shoe against movement in a lengthwise direction.

12. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means operating in time relation to the tensioning and feeding actions of said members for holding the shoe against movement in a lengthwise direction.

13. In a lasting machine, a pair of rotatable and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe, and means for engaging the bottom of the shoe to hold it against movement in a heightwise direction in response to the tensioning action of said members.

14. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means for engaging the bottom of the shoe to hold it against movement in a heightwise direction in response to the tensioning action of said members.

15. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and means for engaging the bottom of the shoe to hold it against movement in a heightwise direction in response to the tensioning action of said members.

16. In a lasting machine, a pair of rotatable and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe, and yieldable means for urging said members toward each other.

17. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and yieldable

means for urging said members toward each other.

18. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, and yieldable means for urging said members toward each other.

19. In a lasting machine, a pair of rotatable and axially movable members, each provided with cooperating gripping portions, and means for rotating and moving said members axially so as to cause said gripping portions successively to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock heightwise of a shoe and to exert a stress thereon tending to feed the shoe, yieldable means for urging said members toward each other, and means for separating said members, against the action of said yieldable means, to facilitate the introduction of said lasting margin at the beginning of the lasting operation.

20. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of gripping portions, means for rotating and moving said members axially, so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, yieldable means for urging said members toward each other, and means for separating said members, against the action of said yieldable means, to facilitate the introduction of said lasting margin at the beginning of the lasting operation.

21. In a lasting machine, a pair of rotatable and axially movable members, each provided with a plurality of circumferentially spaced gripping portions, means for rotating and moving said members axially so as to cause said gripping portions, successively, to grip and release different portions of the lasting margin of stock to be lasted and, while gripping each of said portions, to move axially and rotate thereby to tension the stock and exert a stress thereon tending to feed the shoe, yieldable means for urging said members toward each other, and means for separating said members, against the action of said yieldable means, to facilitate the introduction of said lasting margin at the beginning of the lasting operation.

22. In a lasting machine, means for tensioning stock to be lasted, heightwise of a shoe, and anti-friction means for engaging the opposite sides of the lasting margin of the stock to guide said lasting margin between the tensioning means.

23. In a lasting machine, rotary means for tensioning stock to be lasted, heightwise of a shoe, and means for engaging the opposite sides of the lasting margin of the stock to guide said lasting margin between the rotary tensioning means.

24. In a lasting machine, rotary means for tensioning stock to be lasted, heightwise of a shoe, and anti-friction means for engaging the opposite sides of the lasting margin of the stock to guide said lasting margin between the rotary tensioning means.

25. In a lasting machine, means for tensioning stock to be lasted, heightwise of a shoe, and for exerting a stress thereon tending to feed the shoe, and means for engaging the opposite sides of the lasting margin of the stock to guide said lasting margin between said tensioning and feeding means.

26. In a lasting machine, means for tensioning stock to be lasted, heightwise of a shoe, and for exerting a stress thereon tending to feed the shoe, and anti-friction means for engaging the opposite sides of the lasting margin of the stock to guide said lasting margin between said tensioning and feeding means.

27. In a lasting machine, rotary means for tensioning stock to be lasted, heightwise of a shoe, and for exerting a stress thereon tending to feed the shoe, and means for engaging opposite sides of the lasting margin of the stock to guide said lasting margin between the rotary tensioning and feeding means.

28. In a lasting machine, rotary means for tensioning stock to be lasted, heightwise of a shoe, and for exerting a stress thereon tending to feed the shoe, and anti-friction means for engaging opposite sides of the lasting margin of the stock to guide said lasting margin between the rotary tensioning and feeding means.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
546,695	Collyer	Sept. 24, 1895
584,744	Ladd et al.	June 15, 1897