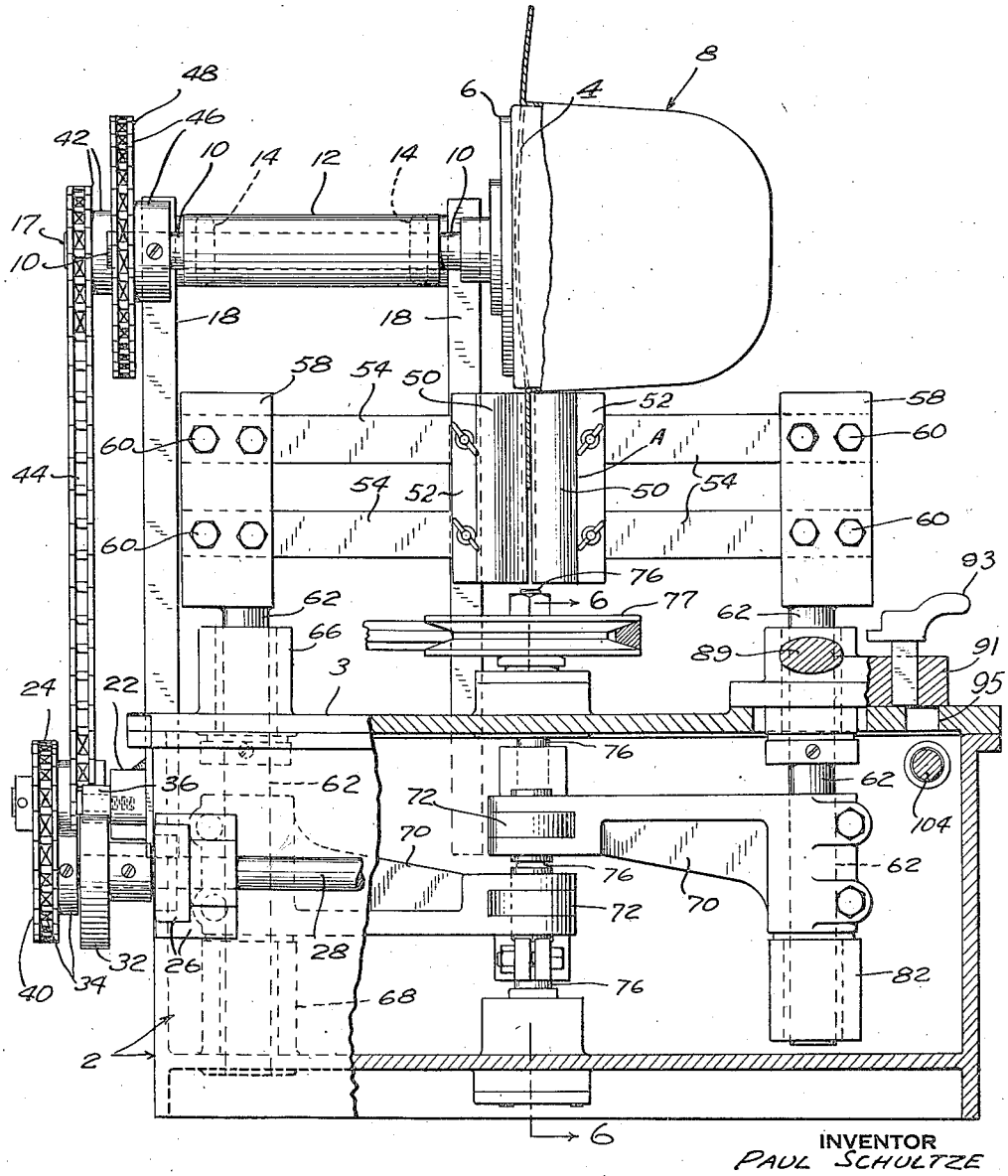
Feb. 3, 1948. P. SCHULTZE 2,435,293

BRIM POUNCING MACHINE AND METHOD OF POUNCING

Filed April 12, 1944 4 Sheets-Sheet 1

Fig. 1.



INVENTOR
PAUL SCHULTZE

BY
Blair, Curtis & Hayward
ATTORNEYS

Feb. 3, 1948. P. SCHULTZE 2,435,293

BRIM POUNCING MACHINE AND METHOD OF POUNCING

Filed April 12, 1944 4 Sheets-Sheet 2

Fig. 2.

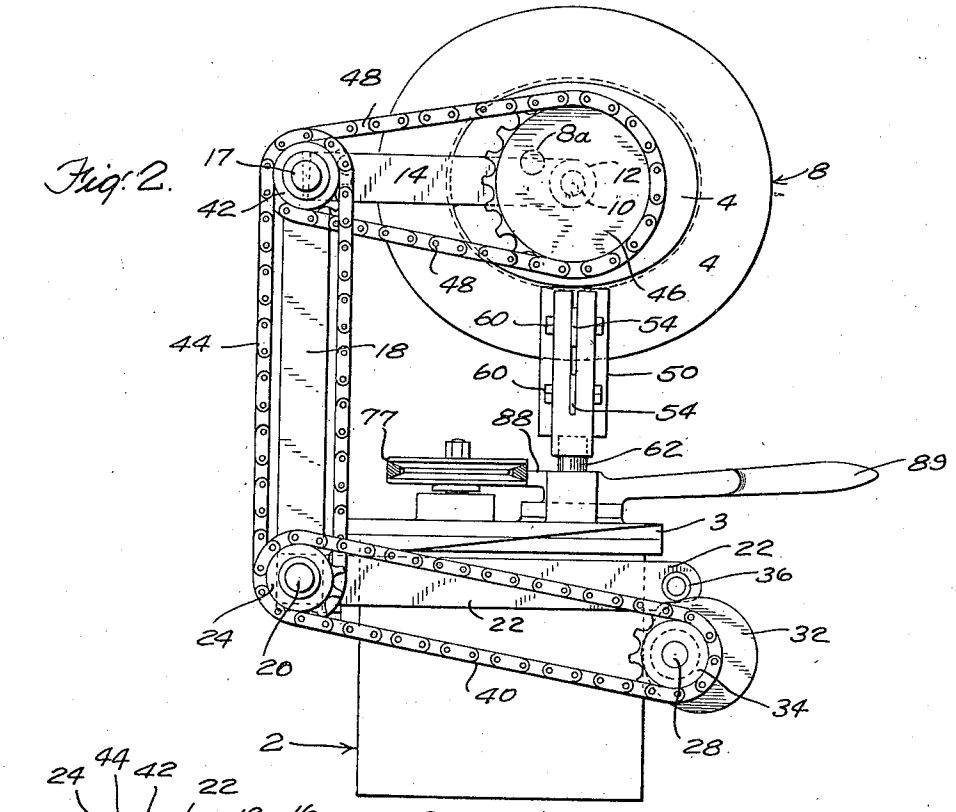
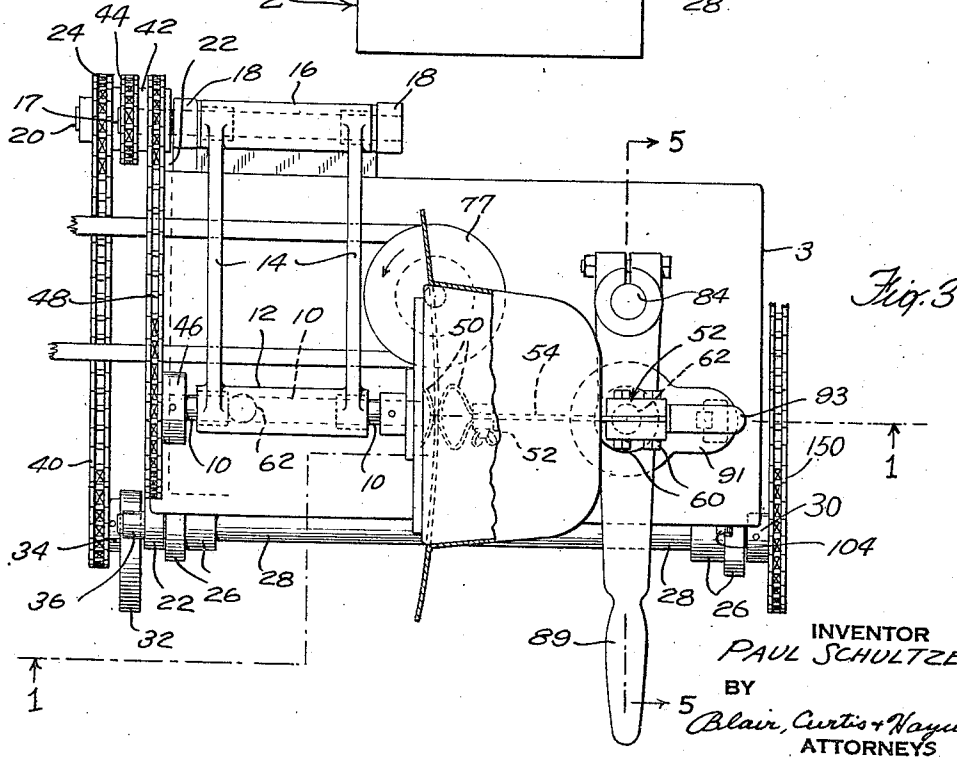


Fig. 3.



INVENTOR
PAUL SCHULTZE
BY
Blair, Curtis & Hayward
ATTORNEYS

Feb. 3, 1948. P. SCHULTZE 2,435,293

BRIM POUNCING MACHINE AND METHOD OF POUNCING

Filed April 12, 1944 4 Sheets-Sheet 3

Fig. 4.

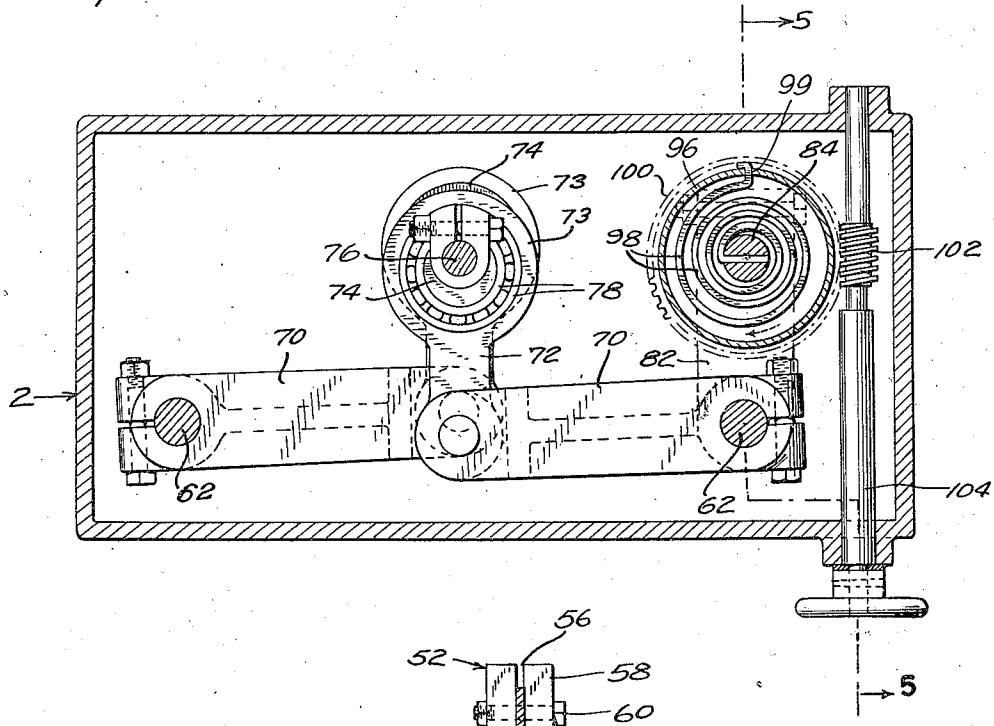
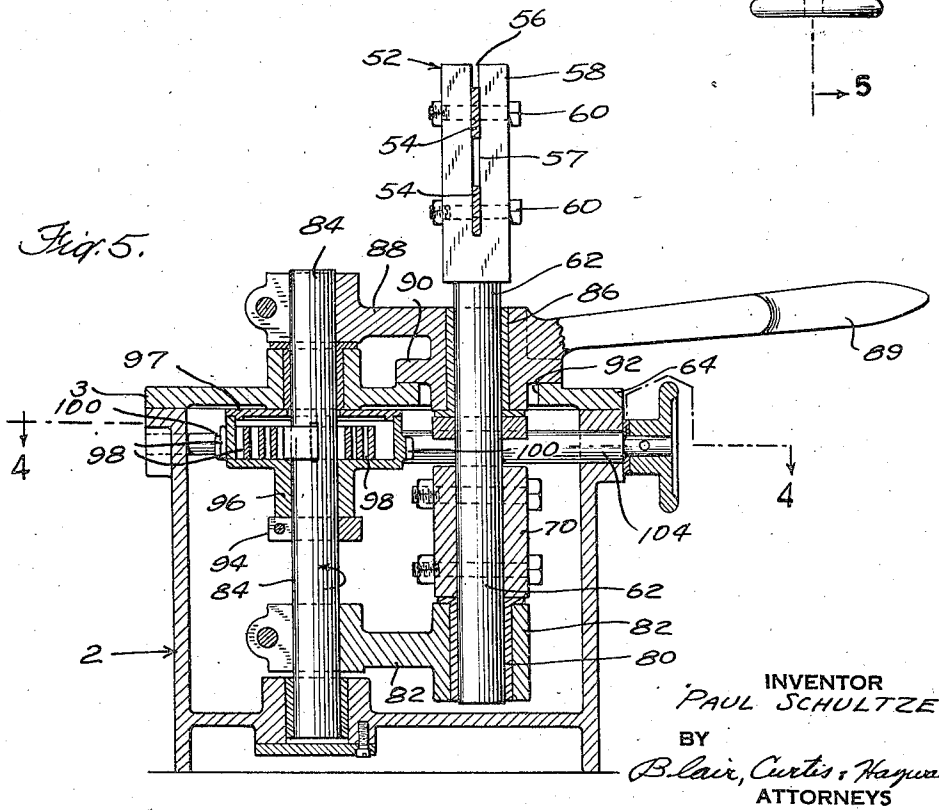


Fig. 5.



INVENTOR
PAUL SCHULTZE
BY
B. Clair, Curtis & Hayward
ATTORNEYS

Feb. 3, 1948. P. SCHULTZE 2,435,293

BRIM POUNCING MACHINE AND METHOD OF POUNCING

Filed April 12, 1944 4 Sheets-Sheet 4

Fig. 6.

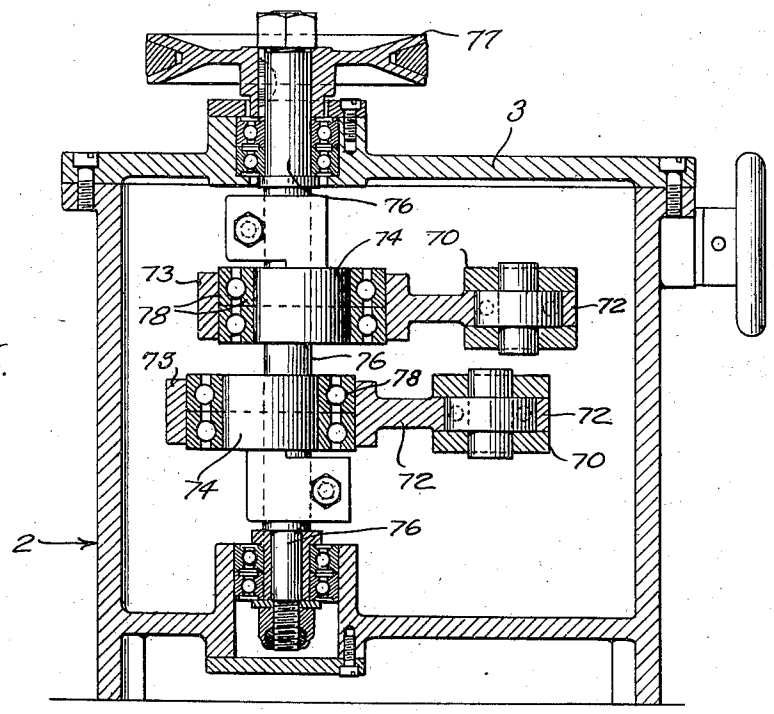
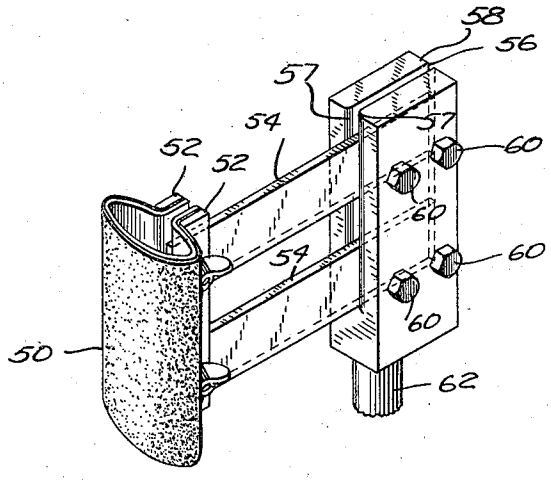


Fig. 7.



INVENTOR
PAUL SCHULTZE
BY
Blair, Curtis & Hayward.
ATTORNEYS

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2,435,293

UNITED STATES PATENT OFFICE

2,435,293

BRIM POUNCING MACHINE AND METHOD OF POUNCING

Paul Schultze, Danbury, Conn., assignor to Doran Brothers Incorporated, Danbury, Conn.

Application April 12, 1944, Serial No. 530,596

21 Claims. (Cl. 223—20)

1

This invention relates to hat-making apparatus and more particularly to a machine and method for pouncing the brim of a hat body.

An object of this invention is to provide a machine for finishing the brims of hat bodies which is simple and durable in construction and which is efficient and dependable in operation. Another object is to provide a brim pouncing machine which will meet the demands of commercial use. Another object is to provide apparatus of the above character which will overcome the disadvantages of prior machines and which may be used efficiently under various conditions and circumstances. These and other objects will be in part obvious and in part pointed out below.

The invention accordingly consists in the features of construction, combinations of elements, arrangements of parts and in the several steps and relation and order of each of the same to one or more of the others, all as will be illustratively described herein, and the scope of the application of which will be indicated in the following claims.

In the drawings in which is shown one of the various possible embodiments of my invention:

Figure 1 is a front elevation of one embodiment of the invention partly in section;

Figure 2 is a side elevation;

Figure 3 is a plan view;

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 5 showing certain of the operative parts;

Figure 5 is a vertical section on the line 5—5 of Figure 4;

Figure 6 is a vertical section taken on the line 6—6 of Figure 1, certain parts being shown in elevation; and

Figure 7 is a perspective view of one of the pouncing pad assemblies.

Referring particularly to Figure 1 of the drawings, a casing 2 having a top wall 3 provides a base for the machine and encloses certain of the working parts. A hat block 4 is removably held on a chuck plate 6 and has mounted thereon a hat body 8. Chuck plate 6 is carried by a floating rotatable shaft 10 which is mounted in a sleeve bearing 12 supported by a pair of arms 14. Arms 14 are rigidly connected to a sleeve 16 which is pivotally mounted (see Figures 2 and 3) on a shaft 17 which is supported on the upper ends of a pair of vertical bars 18 (Figure 2). Bars 18 are rigidly attached at their lower ends to a shaft 20 which is rockably supported by a pair of bearings on the rear side of casing 2. Clamped to shaft 20 and welded to the adjacent bar 18 is a

2

cam follower arm 22 which extends forwardly (to the right in Figure 2) along the side of casing 2. At its right-hand end cam follower 22 carries a cam roller 36 which rides upon a cam 32. As is best shown in Figure 1, cam 32 is mounted upon a driving shaft 28 which is rotatably supported by a pair of bearings 26 on the front wall of casing 2. Shaft 28 Figure 3 is driven from its right-hand end through a sprocket wheel 30. Sprocket wheel 30 is driven from a source of power (not shown) through sprocket chain 150. As shaft 28 turns, cam 32 acts through cam roller 36, arm 22, shaft 20, bars 18, shaft 17, and arms 14 to oscillate shaft 10 in substantially a horizontal plane.

Mounted on and pinned to the left-hand end of shaft 28, as viewed in Figures 2 and 3, is a sprocket wheel 34 which drives a double sprocket wheel 24 rotatably mounted on the end of shaft 20 through sprocket chain 40. A similar double sprocket wheel 42 is rotatably mounted on shaft 17 and is driven through a sprocket chain 44 by a sprocket wheel 24. Wheel 42 through a sprocket chain 48 drives a sprocket wheel 46 pinned to shaft 10. Thus, the rotation of shaft 28 is transmitted to floating shaft 10. However, sprocket wheel 46 has twice as many teeth as has sprocket wheel 42 with the result that shaft 10 rotates at one half the speed of shaft 28.

The pouncing operation is performed by a pair of pouncing tools which are mounted with their pads 50 on the opposite sides of the brim of the hat directly beneath shaft 10. Pads 50 are made from thin spring steel, their faces are curved in cross section, and they include integral spring portions held together in a zone behind the central portion of the pad member. As shown best in Figure 7, each pad has a sheet of sandpaper thereon which is held in place by a pair of blocks 52 removably attached to the pad. The pad is supported by a pair of leaf springs 54, each of which is attached at one end to the pad and at the opposite end to a block 58. Each of the springs is held in a slot 56 in the block by two clamping screws 60. The slot surfaces are curved on the inner edges at 57 to present smooth curved surfaces over which the springs flex; thus, the springs do not bend over sharp edges. Each block 58 has a shaft extension 62 at its lower end which (see Figure 1) extends through the top wall 3 of casing 2.

The shaft extension 62 at the left in Figure 1 is supported by a pair bf bearing sleeves 66 and 68, and clamped to the shaft extension is a rocking arm 70 (see Figure 4). Attached to the opposite end of arm 70 is a crank arm 72 which has

an eye 73 (see also Figure 6) at its opposite end surrounding a crank 74 clamped on a crank shaft 76 driven from the top by a pulley 77. The shaft extension 62 at the right (Figure 4) has a similar rocking arm 70 and a similar crank arm 72 which has an eye 73 (Figure 6) surrounding a crank 74 clamped to crank shaft 76. Each of the eyes 73 is provided with a ball bearing 78.

The pad assembly at the right (Figure 1) is adapted to be swung so that its pad is moved away from the other pad to permit the placing of the hat brim between the two pads. Furthermore, spring biasing means is provided to hold this swinging pad against the hat brim and thus insure the engagement of the brim by the two pads. The mechanism for permitting the swinging of this pad assembly is shown best in Figures 4 and 5. The lower end of shaft extension 62 is supported by sleeve bearing 80 which is carried by a swinging arm 82 clamped to a vertical shaft 84. The upper end of shaft extension 62 is supported by sleeve bearing 86 carried by an arm 88 clamped to the upper end of shaft 84. Sleeve bearing 86 has a flange 90 which overlies the edges of a slot 92 in the top wall 3 of casing 2.

Near the center of shaft 84 is clamped a collar 94 upon which rests a spring casing 96 which has a cover 97 and encloses a flat coil spring 98. The inner end of spring 98 is attached to shaft 84 and the outer end is attached to casing 96 at 99. As shown in Figure 4, casing 96 has peripheral teeth 100 which are engaged by a worm 102 on a tensioning shaft 104. Shaft 104 is rotated manually to tension spring 98 clockwise (Figure 4) and this tends to swing shaft extension 62 to the left and hold the pad in contact with the hat brim as explained above.

It is important that the pads be held apart during the time that they are being oscillated without a hat brim between. Furthermore, it is desirable that the swinging pad be easily moved from the other pad. Accordingly, arm 88 has a hand lever extension 89 (see Figure 3) which is grasped by the operator to swing the pad from engagement with the hat brim. Arm 88 also has a side extension 91 which carries a vertically slidable pin 93. Positioned in the path of movement of pin 93 is a hole 95 into which the lower end of pin 93 falls when the pad is in the disengaged position; thus, after disengaging the pad the operator's hands are free to swing the hat block upwardly by grasping sleeve bearing 12. The hat block with the hat thereon is then replaced with another hat block with the next hat to be treated. The hat block is then swung downwardly to the position with the brim between the pads and pin 93 is lifted and the pad is moved into place by the tension of spring 98. During the changing of the hats shaft 28 continues to rotate as does pulley 77.

Referring again to Figure 1, when it is desirable to pounce the brim of a hat, the hat is placed on a block and the block is positioned on the chuck plate 6 on the floating shaft 10. The motor supplying power to shaft 28 is started so that the hat is rotated and oscillated horizontally to compensate for the oval shape of the hat block. At the same time, the motive means supplying power to pulley 77 is started. The hat block is then swung downwardly to position the brim between the pads, and the movable pad is released by disengaging pin 93 and allowed to move against the brim. The pads working on the opposite sides of the hat brim effectively pounce the brim, and the pad 50 beneath the crown of the hat tends to hold the hat up. Illustratively, cam shaft 76 is rotated 3600 R. P. M. and shaft 28 is rotated 30 R. P. M. The relative number of teeth in sprocket wheels 42 and 46 results in shaft 10 turning 15 R. P. M.

As indicated above, the horizontal oscillation of the hat support maintains the proper relationship between the hat and the pads in spite of the fact that the hat is oval. As is best shown in Figure 2, when the center of rotation is directly above the pads, the pads contact the hat at either the major or minor axis of the oval; at positions between the major and minor axes the center of rotation is moved so as to maintain the pad tangent to the curvature of the crown. Thus, assuming that the hat is rotating clockwise and is moving from the position where the pouncing pads contact the brim at the minor axis toward the position where the pads contact the brim at the major axis, the center of rotation is moved to the left (Figure 2) as indicated in broken lines at 8a; the end of the horizontal oscillation is reached at the position where the curvature of the oval of the hat changes from the large curvature at the side of the oval to the small curvature at the end of the oval. The axis of rotation is then moved to the right so that the axis is back to the central position when the pads reach the major axis of the hat. During the next quarter revolution of the hat the axis is moved to the right and thence back to the central position again.

As many possible embodiments may be made of the mechanical features of the above invention, all without departing from the scope of the invention, it is to be understood that all matter hereinabove set forth, or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In hat-making apparatus, a pouncing tool comprising, a flexible metallic pad member presenting a substantially rectangular pad face supported at the sides of the face by integral spring portions which are held together in a zone behind the central portion of the pad member, and flexible arm means connected to said pad member at one extremity and adapted to be oscillated from the other extremity, whereby the oscillation causes a whipping vibratory movement of the pad member.

2. In hat-making apparatus, a pouncing tool comprising, a flexible metallic pad member of thin spring steel presenting a substantially rectangular pad face supported at the sides of the face by integral spring portions which are held together in a zone behind the central portion of the pad member, a pair of elongated spring steel arms connected to said pad member at one extremity and adapted to be oscillated from the other extremity, a mounting shaft attached to said other extremity of said arms, and means to oscillate said shaft, whereby the oscillation causes a whipping vibratory movement of the pad member.

3. In apparatus for finishing a hat brim, a base, a crankshaft mounted on said base, means for driving said crank shaft, cam means on said shaft, a pair of crank arms carried by said cam means and adapted to be oscillated in opposite-phase relationship, a pair of rocking shafts mounted on said base, a pair of rocking arms associated respectively with said rocking shafts with each arm clamped to its shaft and connected to one of said crank arms whereby the rotation

of said crankshaft oscillates said rocking shafts in opposite-phase relationship, a pair of pouncing tools mounted respectively on said rocking shafts and so related as to engage the opposite sides of a hat brim positioned therebetween, and means to rotate a hat having the brim positioned between said tools.

4. In apparatus for finishing a hat brim, a base, a vertical crankshaft within said base and extending from the top thereof, means for imparting rotary movement to said crank shaft, cam means on said shaft, a pair of crank arms carried by said cam means and adapted to be oscillated in opposite-phase relationship, a pair of vertical rocking shafts mounted on said base, a pair of rocking arms associated respectively with said rocking shafts with each arm clamped to its shaft and connected to one of said crank arms whereby the rotation of said crankshaft oscillates said rocking shafts in opposite-phase relationship, a pair of pouncing tools mounted respectively on the upper ends of said rocking shafts above said base and so related as to engage the opposite sides of a hat brim positioned therebetween, a block to mount a hat with the brim positioned between said tools, a shaft to rotatably mount said block, and means to rotate said shaft.

5. In a hat finishing machine, the combination of, a base, means for mounting a hat body upon said base to rotate about a substantially horizontal axis with the hat moving freely vertically, pouncing tool means to pounce the brim in a zone substantially beneath the axis of rotation and to simultaneously support the hat and the parts upon which the hat is mounted, and means to oscillate the hat horizontally and substantially transversely of the axis of rotation at a rate of two complete oscillations for each revolution of said hat.

6. In apparatus for finishing the brim of a hat, the combination of, means for mounting a hat for rotation about an axis, a pair of pouncing pads engaging the opposite sides of the brim, separate flexible arm means for supporting each of said pads, oscillating means acting through said arm means to impart opposite phase oscillation to said pads, and means to rotate the hat.

7. In hat making apparatus, a pouncing tool comprising, a pad member, flexible arm means, means mounting said pad member on said arm means, arm supporting means, means connecting said flexible arm means to said arm supporting means, and means to oscillate said arm supporting means, whereby the oscillation causes a whipping vibratory movement of said pad member.

8. In hat making apparatus, a pair of pouncing tools comprising, a pair of pad members, flexible arm means for supporting each of said pad members, arm supporting members for each of said last-mentioned means, each of said flexible arm means being connected to its pad member and to its arm supporting member, and means to oscillate each of said arm supporting members in opposite phase relationship, whereby said pads are oscillated with a whipping movement in opposite phase relationship with respect to each other.

9. In the art of finishing a hat brim, the steps of, rotating a hat body about an axis, pouncing the brim of said hat by brim pouncing elements moving tangentially to said hat body, and oscillating said hat body in the directions of movement of said pouncing elements in timed relationship with respect to the speed of rotation of said hat to maintain the brim pouncing elements at all times substantially tangent to the curvature of the hat body.

10. In apparatus for finishing the brim of a hat, in combination, means for mounting a hat for rotation about an axis, pouncing pad means for pouncing the brim of a hat moving tangentially with respect to the hat body, means to impart an oscillatory movement to the hat in the directions of movement of said pouncing pad means, and means to rotate the hat in timed relationship with respect to the oscillation of said hat.

11. In apparatus for finishing the brim of a hat, the combination of, means for mounting a hat for rotation about an axis, a pair of pouncing pads engaging the opposite sides of the brim, separate flexible arm means for supporting each of said pads, oscillating means acting through said arm means to impart opposite phase oscillation to said pads, means to impart an oscillating movement to the hat transversely to the axis of rotation, and means to rotate the hat in timed relationship with respect to the oscillation of the hat.

12. In apparatus for finishing the brim of a hat, in combination, a pair of pad assemblies with their pad faces positioned to receive the brim of a hat therebetween and moving tangentially with respect to the hat body, a floating shaft assembly for mounting a hat to rotate about a horizontal axis above said pad assemblies, means to oscillate said floating shaft assembly in timed relationship to the speed of rotation of said floating shaft in the directions of movement of said pouncing elements, and means to impart rotary movement to said floating shaft.

13. In apparatus for finishing the brim of a hat, in combination, shaft means rotatably mounting a hat, means for rotating said hat, a pair of pouncing pads positioned on opposite sides of the brim of said hat, means to oscillate said pouncing pads in opposite phase relationship with respect to each other, cam means, and means operatively connecting said cam means to said shaft means, said cam means acting through said connecting means and said shaft means to oscillate said hat in the directions of movement of said pads, said cam means oscillating said hat transversely of the axis of rotation of said hat at a rate of two complete oscillations for each revolution of said hat.

14. In apparatus for finishing the brim of a hat, in combination, a base, a pair of parallel shafts mounted on said base adapted to rock about their longitudinal axes, a pair of arms connected to said shafts extending toward each other, a pair of pouncing pads mounted on the opposed ends of said arms, means for rotatably mounting a hat to position its brim between the faces of said pouncing pads, means for rotating said hat mounting means to feed its brim between said pouncing pads, and means for rocking said shafts in opposite phase relationship with respect to each other, whereby the faces of said pads move tangentially with respect to the brim of said hat as they pounce the brim of said hat.

15. In apparatus for finishing the brim of a hat, in combination, a pair of parallel shafts adapted to rock about their longitudinal axes, a pouncing pad mounted on the end of each of said shafts, the faces of said pads being in opposed relationship with respect to each other, means for rotatably mounting a hat to position its brim between the faces of said pouncing pads, means

for moving one of said shafts toward and from the other of said shafts to move said pouncing pads into and out of pouncing relationship with respect to each other, and means for rocking said shafts with a reciprocating action in opposite phase relationship with respect to each other, whereby the faces of said pads move tangentially with respect to the brim of said hat as they pounce the brim of said hat.

16. In a machine for pouncing a hat brim, the combination of, a support, a pair of parallel shafts, means mounting said shafts on said support for oscillating movement about their axes, a pad supporting member secured to each of said shafts, a pouncing pad attached to each of said supporting members, said supporting members extending generally toward each other whereby said pads may be juxtaposed in hat brim receiving relation to engage and pounce the opposite sides of a hat brim disposed therebetween, means for supporting said hat to position its brim between said pads, means for rotating said hat, and means for oscillating said shafts in opposite phase relationship with respect to each other thereby to swing said supporting members and accordingly said pads back and forth over the opposite sides of said brim, so that any point on the operating surface of either pad during movement thereof generates an arc which lies in a plane extending transversely through the brim of said hat and the rock axes of said shafts.

17. In a machine for pouncing a hat brim, the combination of, a pair of pouncing pads having operating surfaces arcuate in cross section, supporting means mounting said pads in juxtaposition with portions of their operating surfaces opposed to one another in a position to receive the brim of a hat therebetween, means for supporting said hat to position its brim between said pads, means for rotating said hat, and means for driving said first-mentioned supporting means to swing said pads back and forth along arcuate paths in relatively opposed directions so that any point on the operating surface of either pad during the movement thereof generates an arc that lies in a plane extending transversely through the plane of the portion of said brim being pounced.

18. In a machine for pouncing a hat brim, the combination of, a pair of pouncing pads, supporting means mounting said pads in juxtaposition with portions of their operating surfaces opposed to one another in a position to receive the brim of a hat therebetween, means for supporting said hat to position its brim between said pads, means for rotating said hat, means for driving said first-mentioned supporting means to swing said pads back and forth along arcuate paths in relatively opposed directions so that any point on the operating surface of either pad during the movement thereof generates an arc that lies in a plane substantially normal to the plane of the portion of said brim being pounced, and means for maintaining the crown of the hat in contact with the end of one of said pads during the pouncing operation.

19. In a machine for pouncing a hat brim, the combination of, a pair of pouncing pads having arcuate operating surfaces, a pair of supporting members mounting said pads in juxtaposition with portions of their operating surfaces opposed to one another in a position to receive the brim of a hat therebetween, means for supporting said hat to position its brim between said pads, means for rotating said hat, means for driving said supporting members to rock said pads back and forth along arcuate paths in opposite phase relationship in respect to each other so that any point on the operating surface of either pad during the movement thereof generates an arc that lies in a plane extending transversely through the plane of the portion of said brim being pounced, means mounting at least one of said supporting members for movement toward and from the other supporting member, and means operatively associated with said last-mentioned means for moving said movable supporting member toward and from the other supporting member and thus moving said pouncing pads toward and from each other or into and out of pouncing position with respect to each other.

20. The herein described method of pouncing the brim of a hat which includes the steps of, rotating the hat about its axis, and pouncing opposite sides of the brim of said hat by curved pouncing surfaces in such a manner that a given point on either surface engageable with the brim moves with an oscillating motion in an arcuate path that is tangent to the surface of the brim being pounced and that lies in a plane extending transversely through the plane of the surface of the brim being pounced.

21. The herein described method of pouncing the brim of a hat which includes the steps of, rotating the hat about its axis, pouncing opposite sides of the brim of said hat by curved pouncing surfaces in such a manner that a given point on either surface engageable with the brim moves with an oscillating motion in an arcuate path that is tangent to the surface of the brim being pounced, and that lies in a plane extending transversely through the plane of the surface of the brim being pounced, and moving the axis of rotation of the hat back and forth relative to the plane of said arcuate path in timed relation to the movement of the pouncing surfaces along the brim of said hat and in a path substantially normal to the plane of said arcuate path.

PAUL SCHULTZE.

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