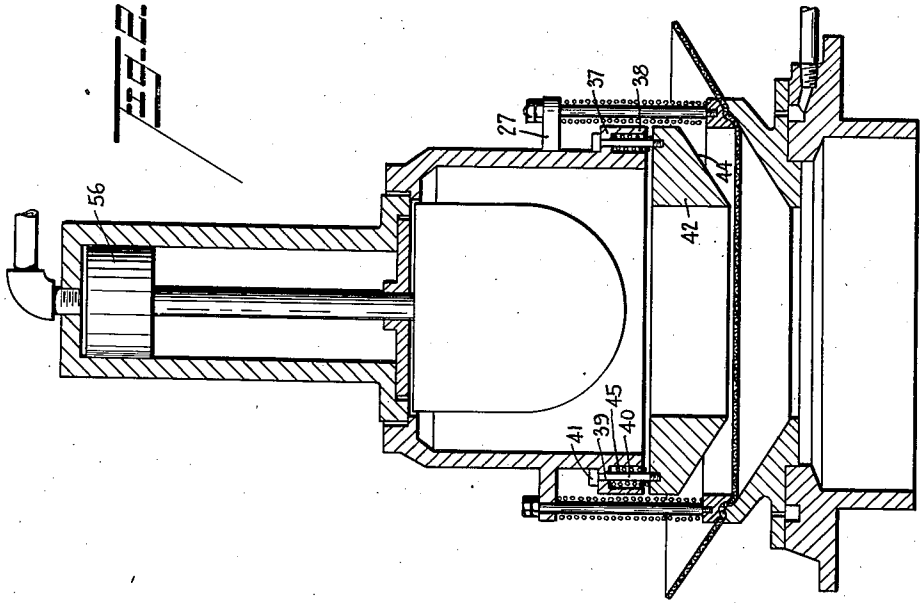
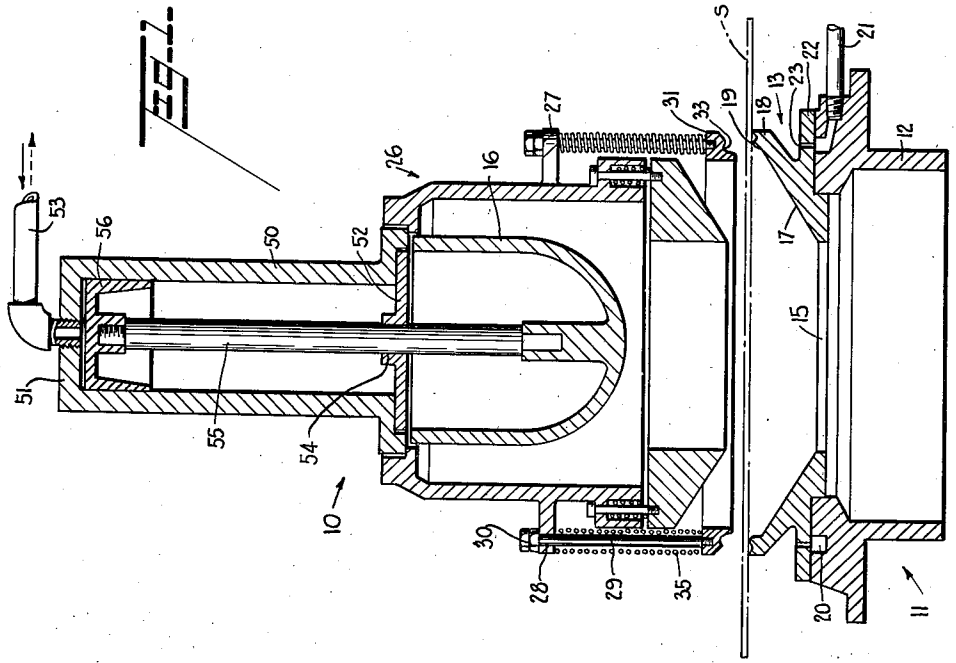
Jan. 6, 1942. G. S. ADLER ET AL 2,268,555

HATMAKING MACHINE

Filed May 6, 1939 4 Sheets-Sheet 1





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HATMAKING MACHINE

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Fig. 2.

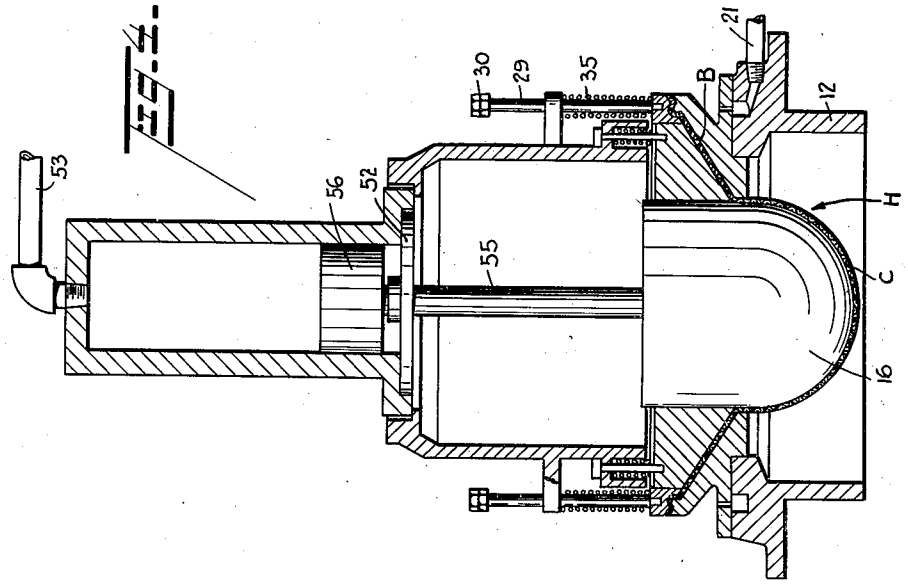
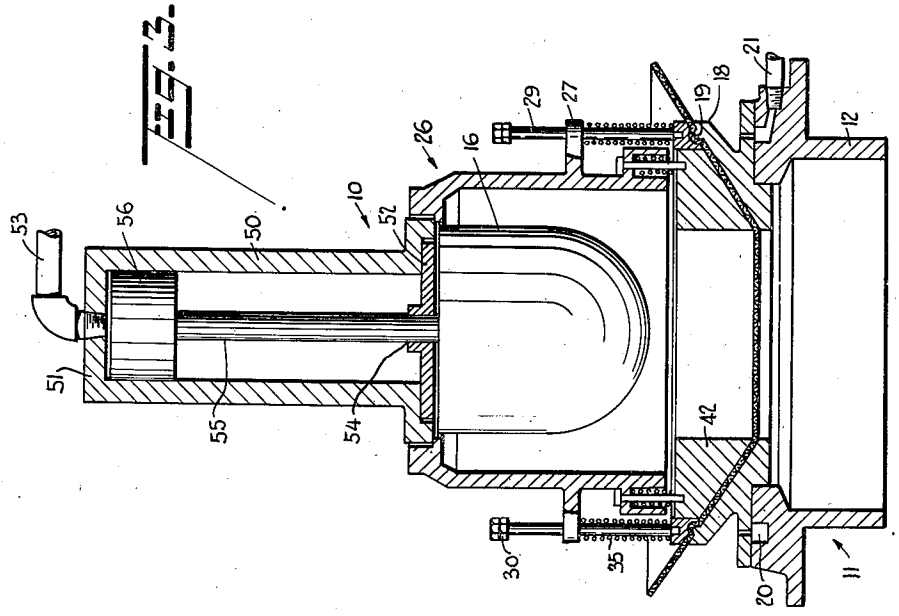


Fig. 3.



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HATMAKING MACHINE

Filed May 6, 1939 4 Sheets-Sheet 3

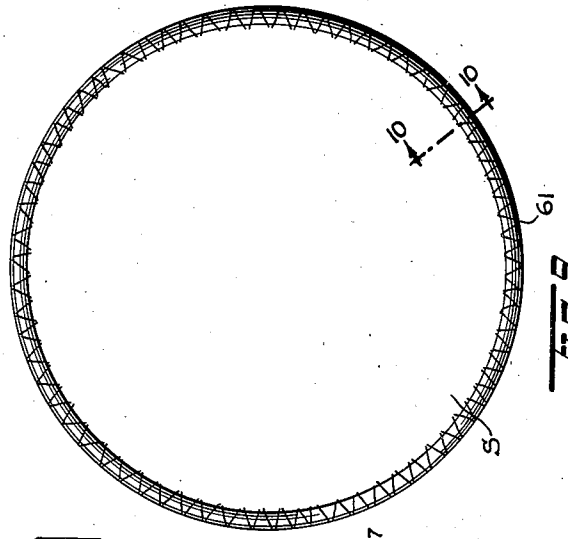


FIG. 9.

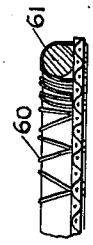


FIG. 10.

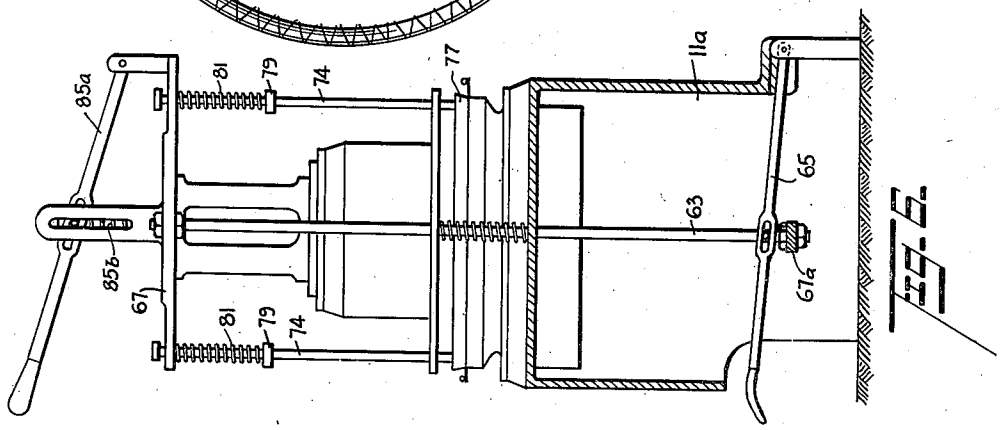


FIG. 8.

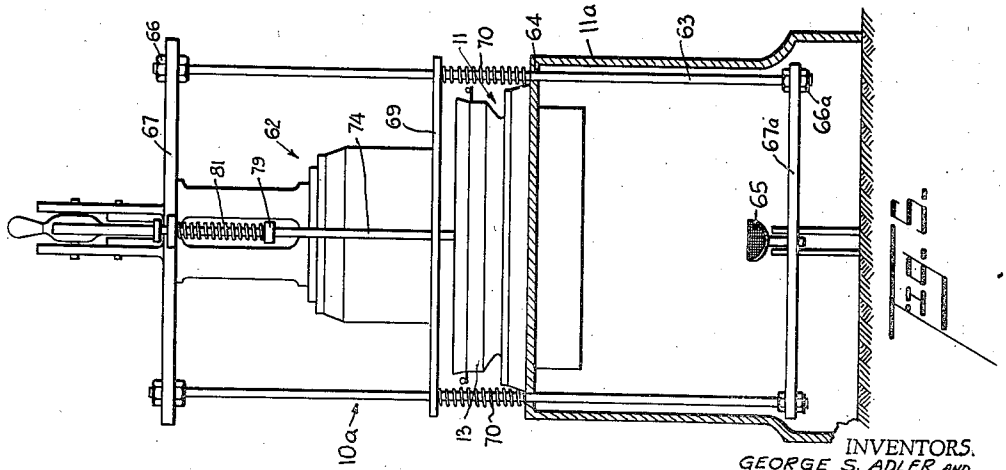


FIG. 5.

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HATMAKING MACHINE

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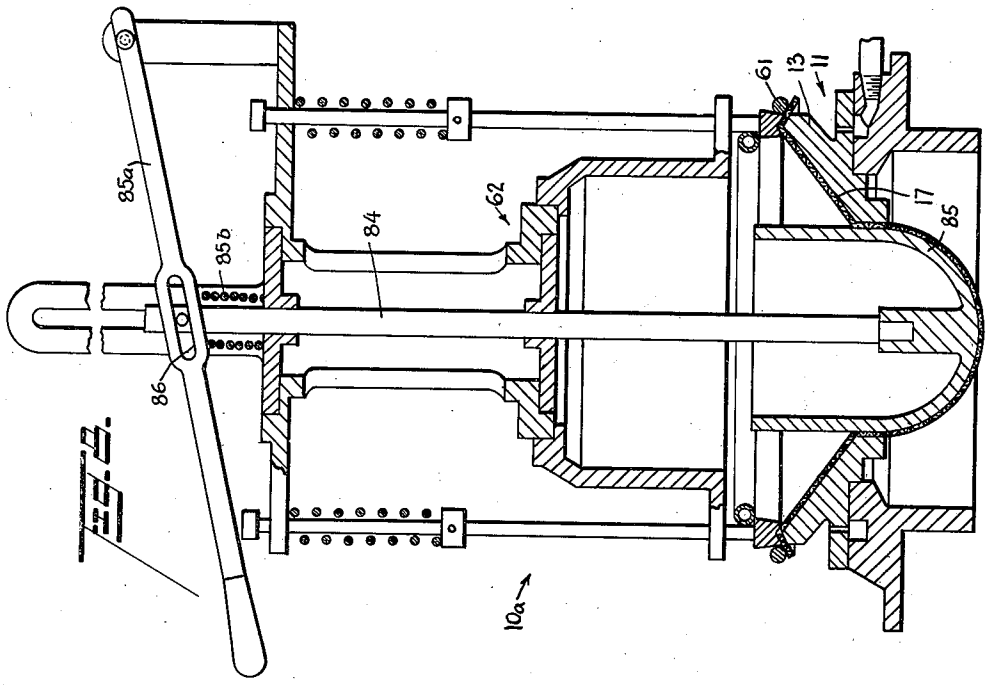


FIG. 4.

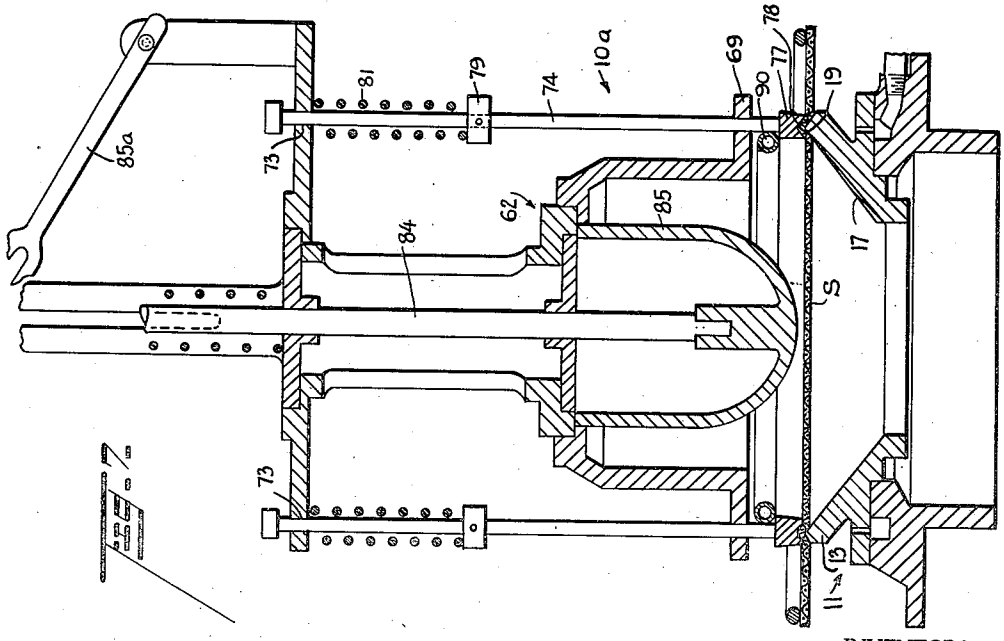


FIG. 5.

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2,268,555

UNITED STATES PATENT OFFICE

2,268,555

HATMAKING MACHINE

George S. Adler, New York, and Helmuth W. Waldorf, Staten Island, N. Y., assignors, by direct and mesne assignments, of one-half to said Adler and one-half to Seymour Prince, New York, N. Y.

Application May 6, 1939, Serial No. 272,196

5 Claims. (Cl. 223—12)

This invention relates to apparatus for and methods of making hat bodies. It is particularly directed to the method of making a hat body having a crown and a brim, from a flat piece of material, such as felted wool, and to a machine for making such a hat in accordance with said method.

This application is a continuation in part of application of applicants for Hatmaking machine, Serial No. 133,170 filed March 26, 1937.

An object of this invention is to provide a method of forming a hat body of flat stock which consists in clamping the stock between a pair of annular clamps, resiliently pressed together against opposite sides of said piece of stock, one of the clamps being disposed at the periphery of an annular die for the top surface of the brim of the hat body, and then lowering a crown block against the center of the piece of stock to draw the material through the spring pressed clamps, and push the same through the central opening of the brim die to press the material against said brim die, whereby the brim portion of a hat body is formed against the brim die, and the crown portion of the hat is formed by the crown block.

Another object of this invention is to provide a method of the character described, in which a cord is stitched annularly around the piece of material on a diameter larger than the diameter of the clamps, whereby to act as a stop when the material is drawn through the clamps, so that after the cord contacts the clamps further movement of the crown block through the brim die will stretch the material, whereby the material is partly drawn through the spring pressed clamps and partly stretched. With this method the hat body may be made from a smaller sheet. The stop cord also serves to permit the material to be drawn through the clamps evenly, because if the material is drawn through the clamps at any point faster than at another point, the cord will contact the clamps sooner at the point where the material is drawn through faster, and the cord will serve as a stop at said point, while permitting the material to continue to be drawn through the clamps at other points where the cord has not yet contacted the clamps. When the cord substantially contacts the clamps all around, then the stretching of the cloth begins, as the crown block continues moving downwardly through the central opening in the brim die.

A further object of this invention is to provide in a machine of the character described, a pair of spring pressed clamps to engage opposite sides of the flat stock, one of the clamps being formed with a groove and the other of said clamps being formed with a ridge complementary to said groove, so that the material is drawn between the ridge and groove of said clamps, thereby permitting the stock to be drawn through the clamps more smoothly and evenly.

Still another object of this invention is to provide in a hat body making machine of the character described, a pair of annular clamps adapted to receive a flat piece of stock therebetween, and resilient means to press the clamps against opposite sides of said stock, and a crown block movable relative to said clamps after the clamps have been resiliently pressed together, without changing the pressure of the clamps on the piece of stock.

Yet another object of this invention is to provide a method for making hat bodies, of the character described, consisting in resiliently pressing a pair of annular clamps against opposite sides of a flat piece of stock, and then moving a crown block against the middle of the piece of stock to draw the stock through the clamps, with the pressure of the clamps such as to permit the stock to be drawn therethrough without damaging the stock.

Still another object of this invention is to provide a rugged, compact and durable machine of the character described, which shall be relatively inexpensive to manufacture, easy to manipulate and practical and efficient to a high degree in use.

A still further object of this invention is to provide a highly improved and economical method of the character described, which shall be simple and easy to carry out for efficiently producing brimmed hat bodies.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the combination of steps, features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction and method hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown various possible illustrative embodiments of this invention,

Fig. 1 is an elevational cross-sectional view of the essential parts of a hat body making machine, embodying the invention, at the beginning of the improved method of making a hat body;

Figs. 2 to 4 are elevational cross-sectional views

of the apparatus shown in Fig. 1 at successive stages in the improved method;

Fig. 5 is a front elevational view of the machine, embodying the invention, and illustrating a modified construction;

Fig. 6 is a side elevational view thereof;

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6;

Fig. 8 is a view similar to Fig. 7, but showing another position of the apparatus;

Fig. 9 is a top plan view of the piece of stock from which the hat body is made; and

Fig. 10 is a cross-sectional view taken on line 10—10 of Fig. 9.

Referring now to Figs. 1, 2, 3 and 4, 10 designates a machine embodying the invention for forming a hat body H, having a crown C, and a brim B, from a properly sized, flat, annular piece of stock S of felted wool or other similar material.

The machine comprises a fixed lower part 11. The lower part 11 comprises an annular member 12 supporting a lower annular brim die 13. The die 13 has a central opening 15 of such dimension as to receive a crown block 16. The die 13 has an annular upwardly and outwardly tapering upper surface 17, against which is formed the upper surface of the brim of the hat body, as will be seen hereinafter.

At the outer periphery of the surface 17 is an annular clamp 18 which may be integral with die 13, and formed with an annular, upwardly extending ridge 19.

The member 12 is formed with an annular passage 20 communicating with a gas supply pipe 21, and die 13 has an outwardly extending flange 22 closing the top passage 20 and formed with a plurality of burner openings 23, whereby to heat the die member 13.

The machine 10 further comprises a movable part, head or member 26 disposed above the fixed part 11, and mounted in any suitable manner for vertical movement axially of the fixed part. Member 26 is provided with an outwardly extending annular flange 27 having vertical openings 28 through which there extends a plurality of vertical pins 29, to the upper end of which are screwed nuts 30 contacting the top of flange 27.

The lower ends of the pins 29 are screwed to an annular clamp 31 adapted to contact the clamp 18 of die 13, and formed with an annular groove 33 complementary to the annular ridge 19. Received on the pins 29, and interposed between the clamp 31 and the flanges 27, are coil compression springs 35.

It will now be understood that as the head 26 is moved axially, downwardly toward the fixed part 11, the upper clamp 31 will press a piece of stock S placed on the clamp 18, against the latter. As the head 26 continues to descend, the springs 35 become compressed for increasing the pressure of the clamps against the opposite sides of the piece of stock, the pressure increasing until movement of the head 26 stops.

As shown in Fig. 2 of the drawings, the stock will be pressed around the ridge 19 and into the groove 33.

The head 26 is furthermore formed below the flange 27, with an annular, outwardly extending flange 37, having a downwardly extending skirted portion 38. The flange 37 is formed with a plurality of vertical pin openings 39, through which there extends pins 40 having heads 41 contacting the upper surface of said flange.

Screwed to the lower ends of the pins 41, is an annular upper pressing member 42, having an upwardly and outwardly tapering under-surface 44, complementary to the surface 17 of die 13. Said member 42 has a central opening large enough to permit the crown block to pass therethrough. On the pins 40 and interposed between member 42 and the flange 37, are coil compression springs 45. The pressing member 42 is disposed below the head 26 and somewhat spaced therefrom. As the head 26 descends to clamp the piece of stock, the member 42 will press the piece of stock against the surface 17, as shown in Fig. 3 of the drawings, the weight of said member 42 and the pressure of the springs 45 serving to supply the necessary pressure.

As the head 26 moves from the position shown in Fig. 2 to the position shown in Fig. 3, the lower end of member 42 will engage the piece of stock and draw the piece of stock through the spring pressed clamps. The material thus has to slide around the ridge 19 as it is drawn through the clamps 18, 31 by member 42.

Mounted on the head 26 is an upwardly extending annular cylinder 50, having a top wall 51 and a bottom wall 52. Communicating with the top wall 51, is a pipe 53, by means of which a pressure or vacuum may be applied within the cylinder, as indicated by arrows in Fig. 1.

The bottom wall 52 is formed with an axial opening 54, through which there extends a piston rod 55 carrying a piston head 56 at its upper end, slidably mounted within the cylinder 50. The crown block 16 is carried at the lower end of the rod 55 and projects downwardly.

It will be understood that as the head 26 moves downwardly, from the position shown in Fig. 1 to the position shown in Fig. 3, the crown block will move therewith. After the head 26 is in the position shown in Fig. 3, pressure is turned on in the pipe 53, to drive the piston 56 downwardly to the bottom of the cylinder 50, as shown in Fig. 4 of the drawings. The piston carries with it crown block 16, which presses downwardly against the center of the piece of stock to continue drawing the material through the clamping members to the position shown in Fig. 4, the crown block passing through the openings in the members 42 and 13 to form the crown portion C of the hat body H.

It will be noted that as the crown block moves from the position shown in Fig. 3 to the position shown in Fig. 4, the pressure on the clamping member 31 does not vary, but remains uniform, the pressure being such as to permit the material to be drawn through the clamping members without injuring the stock.

After the parts are held in the position shown in Fig. 4 for a few seconds, usually about fifteen seconds, the pressure is removed from the pipe 53, and a vacuum is drawn on this pipe causing the piston 56 to be retracted to the position shown in Figs. 1, 2 and 3. The head 26 of the machine may then be raised to the position shown in Fig. 1 to remove the upper pressed member 42 and the clamping ring 31 from engagement with the brim portion B of the hat body, after which, the hat body may be removed from the machine.

The hat is not necessarily complete at this point. The body may be provided with suitable trimmings in order to make it a finished article of commerce in accordance with present practice,

and it may be further shaped by any suitable means, but the main shaping, molding and pressing operations are completed in the machine described above.

In Figs. 5, 6, 7 and 8 there is shown a machine embodying the invention, and illustrating a modified construction for an improved method of making a hat body from a flat piece of stock S, having stitched to the periphery and on one surface thereof, by chain stitching **60**, an annular cord **61**, for the purpose hereinafter appearing.

The machine **10***a* shown in Figs. 5, 6, 7 and 8 is substantially similar to the machine shown in Figs. 1, 2, 3 and 4, and comprises a fixed lower part **11** which may be supported on any suitable base **11***a*; and comprises a die member **13** having an upper, upwardly and outwardly flared or tapered surface **17**, and an annular ridge **19** adjacent the upper end thereof constituting a clamping member. The part **11** may be provided with heating equipment similar to that shown in Fig. 1.

Slidably mounted above the part **11**, is a movable head **62**, which may be supported by a pair of longitudinal vertical rods **63** slidably received in openings **64** in the fixed member **11**. Attached to the lower ends of the rods **63** is a foot pedal **65** which may be depressed to lower the head **62**. The upper ends of the rods **63** are fixed by lock nuts **66** to a cross-head **67**, at the upper end of the head **62**. At their lower ends, rods **63** are fixed by lock nuts **66***a* to a cross-member **67***a*. The head **62** is formed with an outwardly extending flange **69**, having openings through which the rods **63** pass. Interposed between the flanges **69** and the fixed part **11**, are coil compression springs **70** to lift the head **62** when the foot pedal is released.

The cross-head **67** is formed with a plurality of through openings **73** through which there extends a plurality of vertical pins or bolts **74**, to the lower ends of which is screwed the annular clamping member **77**, having an annular groove **78** complementary to the ridge **19**. Adjustably attached to each pin **74**, is a collar **79**. Interposed between each collar **79** and the cross-head **67** is a coil compression spring **81**.

Slidably mounted on the head **62** is an axial rod **84** carrying at its lower end a crown block **85**. Pivoted to the upper end of the cross-head **67**, is a lever **85***a*, having a pin and slot connection **86** with the upper end of the rod **84**. Any suitable spring means **85***b* may be provided for normally raising lever **85**, and hence crown block **85**, when the lever is released.

The operation of the machine shown in Figs. 5, 6, 7 and 8 will now be described:

The flat piece of stock S with the cord **61** stitched to the periphery thereof, is placed on top of the lower die **13** in contact with the annular ridge **19**, and concentric therewith. The foot pedal or lever **65** is then depressed, to lower the head **62**. As the head **62** is lowered, the upper clamping member **77** will likewise be lowered until it contacts the piece of stock S. Further pressure downwardly on the foot lever will cause compression of the springs **81** to increase the pressure of the clamping members on opposite sides of the piece of stock. After the foot lever has been depressed, the hand lever **85***a* may then be swung downwardly for lowering the crown block **85**. The crown block contacts the center of the piece of stock S, and as the block is pressed downwardly, it will draw the stock through the clamping members **77** and **19**. The piece of stock will thus be moved downwardly against the brim die surface **17**.

As the crown block is lowered to the position shown in Fig. 8, the piece of stock will be drawn in all around until the cord **61** contacts the clamping member **77**. After the cord contacts the clamping member, the stock cannot be drawn any more through the clamping members, and further movement of the crown block downwardly will cause the material to stretch or give, thus combining the drawing of the stock with the stretching thereof, to form the hat body H.

Should one part of the cord contact the clamping member **77** before other parts of the cord contact said clamping member, the part which contacts stops the drawing operation at that point, permitting the stock to be drawn at other points where the cord has not yet contacted the clamping member.

It will be understood that the drawing operation will thus be completed all around, so as to be uniform, before the stretching operation begins.

An additional gas heater **90** may be mounted on the clamping member **77** to heat the latter.

It will be noted that in the machine shown in Figs. 5 to 8, the crown block first moves together with the head and then moves independently of the head, without increasing the pressure of the springs **81** on the clamping members. With this construction, the collars **79** may be properly adjusted to obtain the proper spring pressure, to firmly clamp the piece of stock while permitting the piece of stock to be drawn through the clamping members.

It will thus be seen that there is provided an apparatus and method in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A method of making a hat body, consisting in attaching a piece of cord annularly around a flat piece of stock, then pressing annular members against opposite sides of the piece of stock inside of the cord, then pressing against the center of the piece of stock, to draw the piece of stock through said annular members, to bring the cord against one of the annular members, and then to continue pushing against the piece of stock to stretch the latter.

2. A method of the character described, consisting in attaching a cord to a flat piece of stock annularly, then placing the piece of stock at the upper end of an upwardly and outwardly tapered brim die, concentrically of said die, then resiliently pressing an annular clamping member against the top surface of the piece of stock, inwardly of the cord, to press the piece of stock against the upper end of the die, then lowering a crown block axially of the die against the piece of stock, and through the central opening of the die, to draw the piece of stock through said clamping member and upper end of the die, and to press the piece of stock against the brim die until the cord stops further drawing of the stock between said clamping member and die, and then

continuing the lowering of the crown block against the piece of stock to stretch the piece of stock for forming the crown and brim of the hat body.

3. A device for making a hat body having a brim and a crown from a flat sheet, comprising an annular die having a surface corresponding to the upper surface of the brim of the hat body, and an annular clamp at the periphery of the die, a member movable axially of said die toward said surface, an annular clamp movably mounted on said member and adapted to press a sheet placed over said die against the first clamp, spring means interposed between said member and second clamp adapted to resiliently press said second clamp against said sheet as said first member is moved toward said die, to press said sheet against said first clamp, a crown block mounted for movement relative to said member and second clamp, and axially of said die, means for moving said crown block against said sheet relative to said member, and through said die to draw said sheet through said clamps, an annular presser member on said first member adapted to press said sheet against said die, and springs interposed between the presser member and the first member.

4. A method of forming a hat body from flat stock, consisting in placing the stock between annular clamping members, one of which has an annular ridge and the other an annular complementary groove, pressing the clamping members against opposite sides of said stock, whereby the ridge presses the stock into the groove, and then pressing against the center of the piece of stock and drawing said piece of stock through the ridged and grooved portions of the clamping members.

5. A method of forming a hat body from flat stock, consisting in placing the stock between annular clamping members, one of which has an annular ridge and the other an annular complementary groove, pressing the clamping members against opposite sides of said stock, whereby the ridge presses the stock into the groove, and then pressing against the center of the piece of stock and drawing said piece of stock through the ridged and grooved portions of the clamping members, and maintaining the pressure of the clamping members on the stock substantially constant as the piece of stock is drawn between said clamping members.

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