April 7, 1942. G. CIPRIANO 2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Filed March 6, 1940 5 Sheets-Sheet 1

Fig. 1.

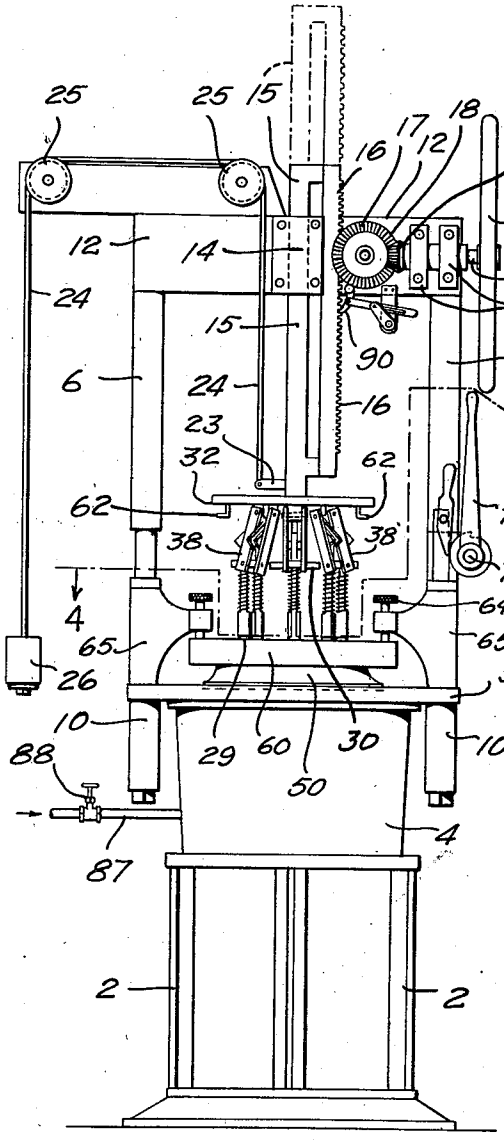
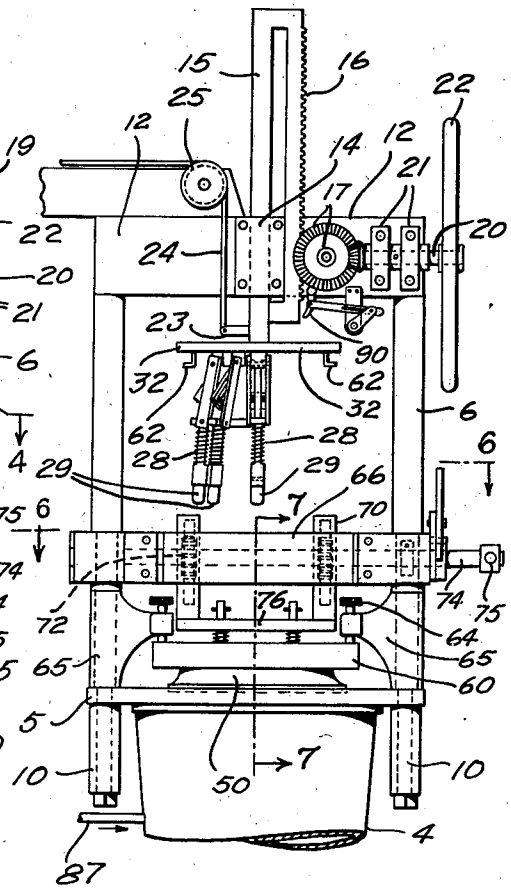


Fig. 2.



INVENTOR
GANDOLFO CIPRIANO
BY
Geo. M. Dowe.
ATTORNEY

April 7, 1942. G. CIPRIANO 2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Filed March 6, 1940 5 Sheets-Sheet 2

Fig. 3.

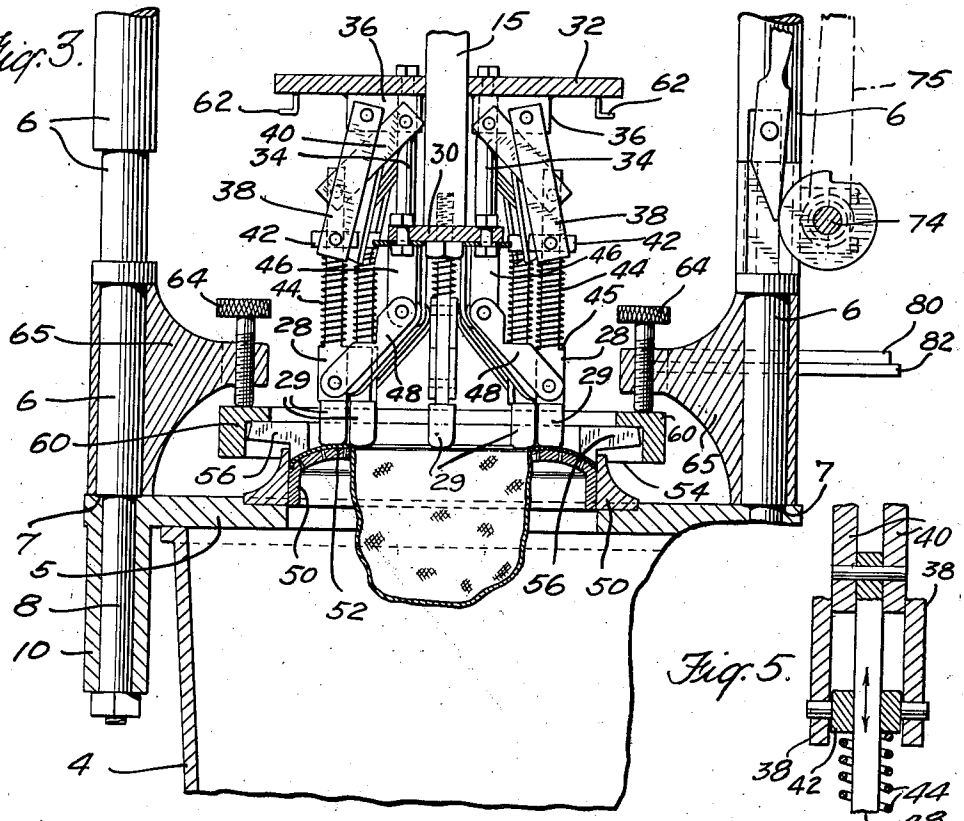
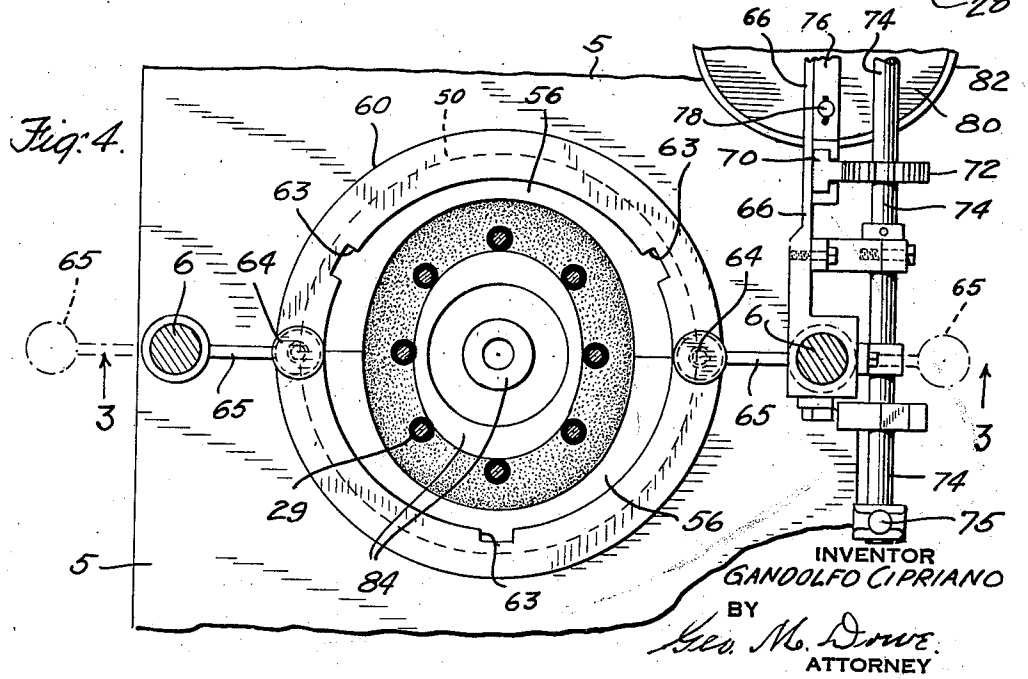


Fig. 5.

Fig. 4.



INVENTOR
GANDOLFO CIPRIANO
BY
Geo. M. Dowe.
ATTORNEY

April 7, 1942. G. CIPRIANO 2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Filed March 6, 1940 5 Sheets-Sheet 3

Fig. 6.

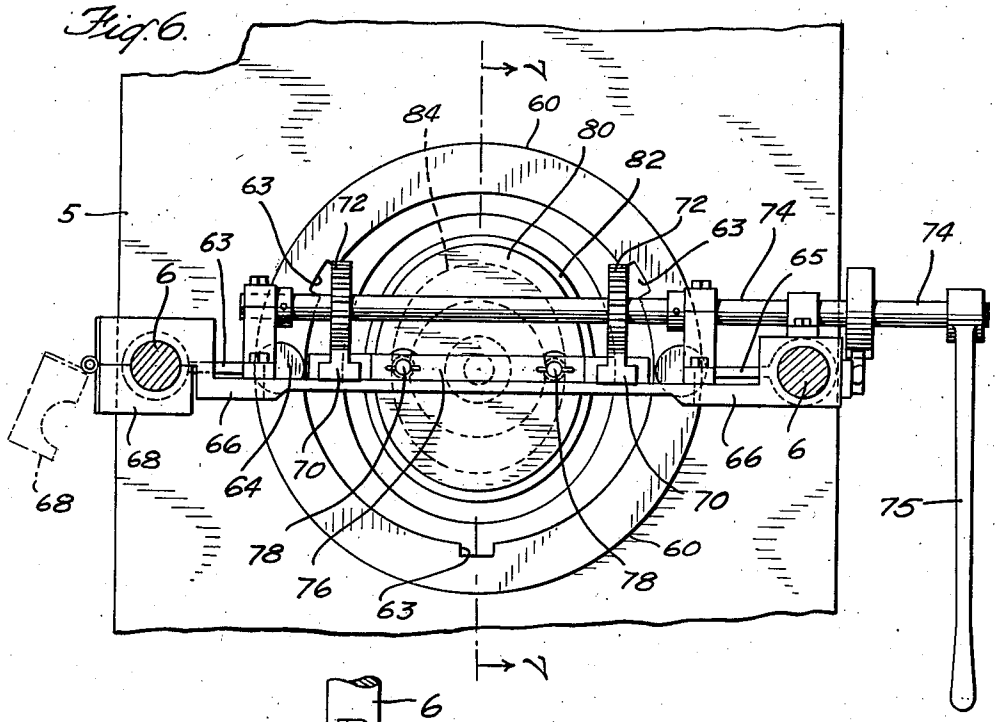
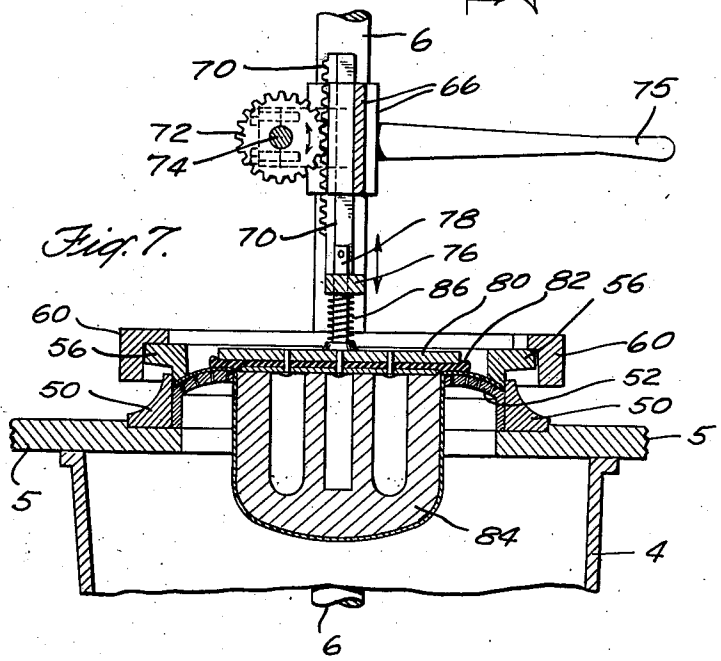


Fig. 7.



INVENTOR
GANDOLFO CIPRIANO.
BY
Geo. M. Dowe.
ATTORNEY

April 7, 1942. G. CIPRIANO 2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Filed March 6, 1940 5 Sheets-Sheet 4

Fig. 8.

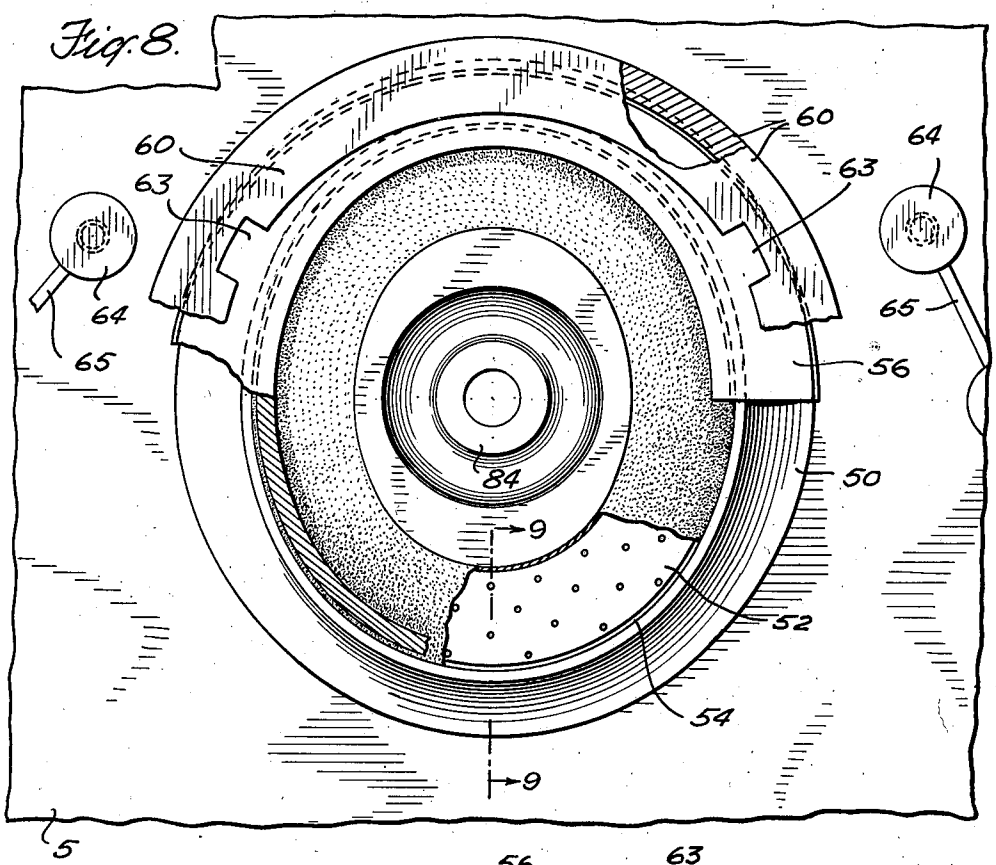
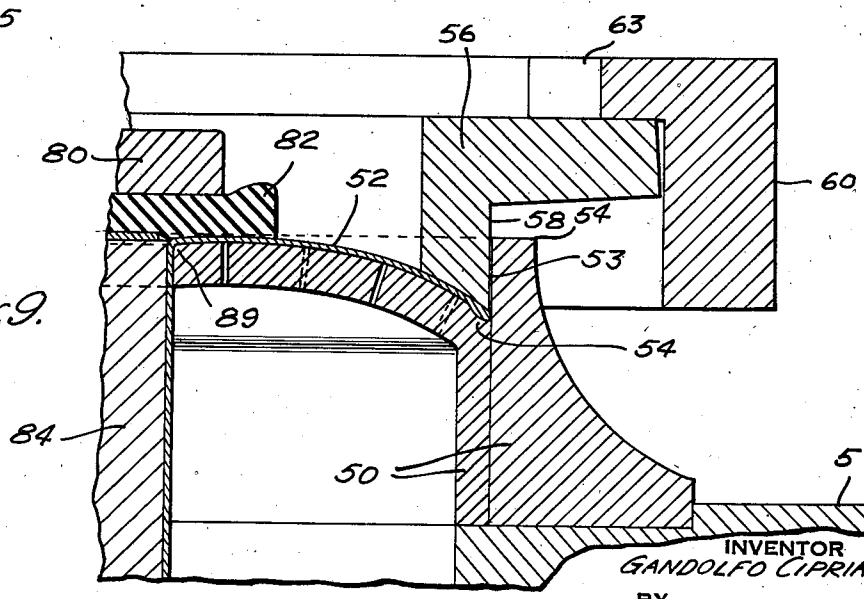


Fig. 9.



INVENTOR
GANDOLFO CIPRIANO.

BY
Geo. M. Dowe
ATTORNEY

April 7, 1942. G. CIPRIANO 2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Filed March 6, 1940 5 Sheets-Sheet 5

Fig. 10

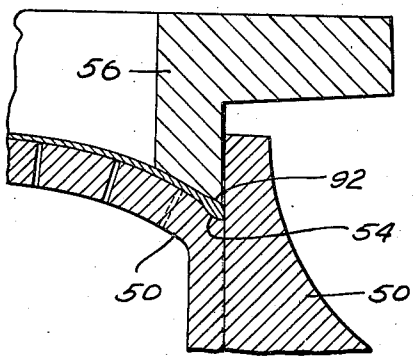
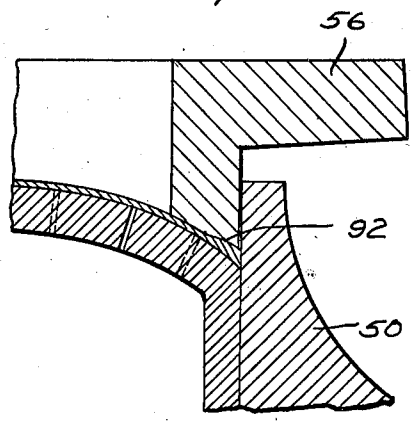


Fig. 11.



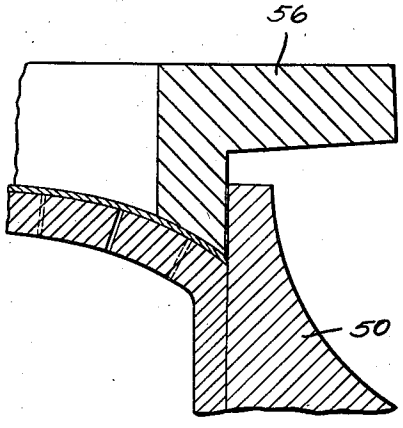


Fig. 12.

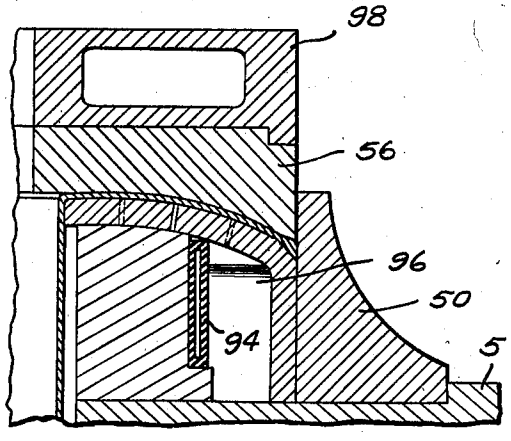


Fig. 13.

INVENTOR
GANDOLFO CIPRIANO
BY
Geo. M. Drive
ATTORNEY

Patented Apr. 7, 1942 2,278,865

UNITED STATES PATENT OFFICE

2,278,865

METHOD OF AND APPARATUS FOR FORMING HATS

Gandolfo Cipriano, Dongan Hills, N. Y.

Application March 6, 1940, Serial No. 322,465

5 Claims. (Cl. 223—12)

The present invention relates to a process and to an apparatus for forming hats, especially hats of felted material.

The process is particularly adapted to hats, the edge of the brim being finished or welted, although the process is also adapted to hats having a brim in which the edge is raw or unfinished.

The invention has for its objects to produce a better formed hat with lessened cost of production. This is made possible by the order in which certain operations are performed; by the elimination of some of the steps heretofore found necessary and to the further fact that some of the steps of the process may rapidly and advantageously be effected by mechanical devices.

Felted hats are manufactured from what are known in the art as hat bodies or blanks. These blanks conform approximately to the size of the hat crown and roughly to the width of the brim. In hats in which the brim in its final state is provided with what is known as a raw edge, the width of the brim in the blank need not be very exact because in forming the hat from such a blank, the brim is cut to the desired width after the crown has been blocked.

In hats having a brim with a finished or welted edge, however, somewhat greater accuracy of the width of the brim in the blank is desirable.

Since the present process and apparatus are especially adapted to the forming of hats from blanks whose brim have a finished or welted edge, it will conduce to the understanding of the present invention to first consider the steps now generally followed in forming hats from blanks of this type.

The blank is first dipped into boiling water to make the felt pliable and is then placed upon a wooden block of the correct size and shape.

Next the brim is adjusted for width. This is a hand operation and consists in pulling and stretching the brim with frequent application of a measuring rule to determine the proper width.

Next an edging tool is applied around the edge to even it as far as possible while maintaining the correct width.

The next step consists in placing the hat in an oven to dry. The drying, however, causes some irregularity especially at the edges of the brim, and its width is sometimes changed during this drying step.

The next step consists in further treating of the hat to remedy the irregularities due to the drying step. The hat is placed on a wooden block such as first used, a string is put around the hat to hold the crown firmly against the block, and some steam is applied to soften the brim, which is again manipulated by hand to give it the proper width.

Various other operations are performed on the hat, such as pouncing, which is performed by hand with the use of fine sandpaper, and possibly greasing or waxing the crown to give it smoothness. The brim of the hat is then ironed by hand to give it the correct shape and desired smoothness. Then the hat is trimmed, that is, the inside and outside bands are stitched on and the lining secured in place, if one be used.

It is to be noted that in the methods at present employed in finishing hats having a welted edge brim, the blocking of the crown is the first stage in the operation. This method has probably been followed because in making hats having a raw edge brim such a method of procedure was logical as the brim was subsequently cut to the correct size and width.

In a hat blank in which the edge is welted, such edge constitutes what might be considered as a dimension determining factor. In the present process, therefore, this dimensional factor is availed of. I therefore first conform the brim of the blank to the size and shape desired in the finished hat and while the brim is being firmly held in its conformed position, proceed with the blocking step.

A number of advantages flow from this new method of procedure and these advantages will be better understood by describing the process in connection with one form of apparatus on which it may advantageously be carried out.

Referring now to the drawings:

Figure 1 is a front elevation of a machine on which the process may be practiced;

Figure 2 is a view similar to Figure 1 but with parts in a different position;

Figure 3 is a part sectional, part elevational view on a larger scale than Figures 1 and 2 and showing the mechanism near the midportion of the machine;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is a detail of the toggle mechanism for operating the presser fingers;

Figure 6 is a part sectional, part-elevational view taken along the line 6—6 of Figure 2;

Figure 7 is a section taken along the line 7—7 of Figures 2 and 6;

Figure 8 is a plan view of the brim mold and parts associated therewith;

Figure 9 is a section on the line 9—9 of Figure 8;

Figures 10, 11 and 12 are details of modifications of the brim mold and presser ring; and

Figure 13 is a portion of a flanging machine.

Referring now to Figures 1 and 2, the machine is supported on a base 2 on the top of which is a hollow steam chamber 4 which supports a circular plate 5 (see also Figure 3). Shafts 6 on opposite sides of the machine shown in Figures 3 and 4 are supported on the plate 5, these shafts having shoulders 7 which bear against the plate 5, the reduced portions 8 passing through members 10 projecting downwardly from the plate 5. At the upper ends the shafts 6 are connected by a cross-beam 12 which supports a number of movable parts to be immediately described. Centrally of the beam 12 is a guide block 14 through which slides a member 15 the outer edge of which is provided with teeth 16 engaged by a pinion 17 supported on a stub shaft carried by the beam 12. A bevelled gear 18, also supported on the same stub shaft, is engaged by a bevelled pinion 19 secured to a shaft 20, the latter being supported by blocks 21 secured to the beam 12. The outer end of the shaft 20 carries a hand wheel 22.

From the mechanism so far described, it is obvious that movement of the hand wheel 22 will result in moving the slide 15 up and down through the guide block 14. In order that this slide 15 and the presser fingers carried thereby may conveniently be balanced, I have shown a bracket 23 extending from the slide and to which bracket a cord or small wire cable 24 is connected. This cable passes over suitable rollers 25 and a suitable weight 26 is attached at its opposite end.

The presser fingers to which reference has just been made are preferably eight in number and are indicated generally by the reference character 28. Their detailed construction will best be understood by references to Figures 3 and 5.

These presser fingers have rubber ends 29 and are supported by the slide 15 in such a manner as to permit their movement outwardly by parallel motion. For this purpose a toggle mechanism is provided which is constructed as follows:

Secured to the slide 15 near its lower end is a plate 30. Another plate 32 is also secured to the slide 15 and spacer rods 34 are bolted to the plates 30 and 32 as clearly shown in Figure 3. A number of plates 36 project from the underside of the plate 32, and to each of these plates is pivoted a link 38 and a link 40. The opposite end of each link 40 is pivoted near its upper end to a presser finger 28. The opposite end of each link 38 is pivoted to a collar 42 secured to each presser finger 28. A spiral compression spring 44 extends between each collar 42 and a shoulder 45 on a presser finger 28. The plate 30 has secured to its underside a plurality of lugs 46, one for each of the presser fingers 28. To the lower end of each of these lugs is pivoted a link 48, the opposite ends of all of these links 48 being pivoted to the lower ends of the presser fingers. By the above described mechanism the presser fingers are capable of parallel motion when pressure is applied to plate 30 through the slide 15 and when the lower ends of the presser fingers meet with resistance sufficient to cause the springs 44 to be compressed.

In the carrying out of my improved process, the presser fingers above described serve to apply yielding pressure to an inner zone of the brim of a hat being treated, which inner zone surrounds the hat crown but is spaced slightly from it. In order that these presser fingers may function in the manner indicated, the hat brim must be supported. The support in the present apparatus consists of a brim shaping and edge confining mold 50. This mold is shown in section in Figure 3, and the right hand portion is shown on an enlarged scale in Figure 9. The surface 52 of this mold conforms to the shape which the brim of the hat is to assume in its final form. The surface 52 terminates in a circumferential groove 54 into which groove the welted edge of the hat brim fits. The central aperture of the mold is of such size that the particular hat being treated exactly fits into this central aperture when the hat crown is being blocked. It is therefore necessary to provide molds of different sizes for different sized hats and for hats of different brim widths. It is also to be particularly noted that the surface 52 as measured from the edge of the aperture to the outside of the circumferential groove 54 is of a width equal to that of the brim of the hat to be formed on the particular mold.

The mold 50 is also provided with a vertical wall 53 of such thickness that its outer circumferential edge 54 is of a size to enable the proper width of the brim to be determined when the hat blank is within the brim mold and the brim edge is made to coincide with the edge 54.

With the apparatus so far described, it will be in order to refer to the preliminary steps in the process of forming a hat in accordance with the present invention. At the initial stage the slide 15 is in its upper position as shown in Figure 2, and the hat to be formed is placed on the mold with the crown projecting through the aperture in the mold, the crown at that time being somewhat irregular in outline as shown in Figure 3. It is to be understood, however, that at this time the presser fingers as shown in Figure 3 are not in their operative position there shown, but the whole slide is raised as previously stated. The hat brim is then conformed to the mold. In order that this may be done conveniently and accurately, the presser fingers are moved to position to engage the hat brim. It is seldom that the brim can immediately be conformed to the mold because of irregularities in the brim. The function of the presser fingers is to hold the brim yieldingly while any adjustments are made to make the brim even all around, and this evening process is facilitated by the circumferential edge 54. The brim is manipulated by hand until the edge of the brim coincides with the edge 54 and if some pulling is necessary, the fingers 28 yield under the pulling action but due to the toggle action the brim is held in the position to which it has been pulled. The edge 54 acts as a gauge and the adjustment of the brim to conform to this gauge is readily accomplished. When the correct gauge of brim has been effected, the brim is pushed down into contact with the surface 52 of the mold and at this stage the hat and presser fingers are in the positions shown in Figure 3; other parts, however, which will immediately be described, are not in the positions shown in this figure, at this time.

Should it be found necessary to stretch the brim somewhat more than usual, the hand wheel 22 is given a partial turn in the direction which will cause the slide to be moved downwardly and

the presser fingers 28 will under this action all be moved outwardly together. The slide is held in its moved position by a pawl 90 supported from a beam 12, the pawl engaging the teeth 16 of the slide 15.

After the hat has been conformed to the brim mold and the yielding pressure has been applied about an inner zone, by the presser fingers 28, suitable pressure is applied to an outer zone of the brim beyond the area of the inner zone. This pressure is effected by a saddle 56, Figures 3, 8 and 9. This saddle is in the form of a ring and preferably for convenience in manipulation, this ring is split along a diameter as shown in Figure 8. The outer surface 58 of this saddle, Figure 9, coincides with the vertical wall 53 of the mold 50 and when suitable pressure is applied to this saddle the hat brim is held in an outer zone for further operations. Pressure is applied to the saddle 56 by means of a pressure ring 60, which ring has an aperture of such size that it can clear the presser fingers and while not in use is supported by the plate 32, through means of hooks 62. For this purpose the pressure ring 60 is provided with a number of gaps or recesses 63, Figure 8.

At this stage of the process the parts are in the position depicted in Figure 3. The pressure is applied to the pressure ring 60 through means of screws 64 carried by pivoted arms 65 supported for rotation on the shafts 6.

During the time that the hat brim is being gauged and conformed to the mold, the arms 65 are swung aside so that they do not interfere with convenient manipulation of the hat brim.

So far the steps of the process have consisted in conforming the hat brim to a brim shaping and edge confining mold, applying yielding pressure to the brim about an inner zone, then applying pressure to the brim in an area constituting an outer zone.

It is to be noted that this latter pressure being controlled by the screws 64 is sufficient to very firmly hold a hat brim between the mold surface and the saddle.

The next step in the process is the blocking of the hat crown while the brim is firmly held by the saddle 56, pressure ring 60 and screws 64.

During this blocking operation, the slide 15 carrying the presser fingers is lifted to its upper position shown in Figure 2 and a wooden block of correct size and shape is placed by hand within the hat crown. Then a frame member 66, pivoted to swing about the right hand shaft 6 as shown in Figures 2 and 4, is swung from the position shown in Figure 4 to the position shown in Figures 2 and 6. The opposite end of the frame 66 is provided with a hinged portion 68, which when swung from the dotted line position in Figure 6 to the full line position there shown, serves to lock the frame in position. The frame 66 carries two toothed racks 70, Figures 6 and 7, each of which racks is engaged by a pinion 72, said pinions being supported on a shaft 74 suitably supported by the frame 66. The shaft 74 may be rotated by handle 75, thereby causing the pinions 72 to move the racks 70 up and down. These racks carry at their lower portions a bar 76. This bar is apertured as shown in Figure 6 and through each aperture passes a short shaft 78. These shafts support a disc 80, Figures 4 and 7, preferably of metal. Riveted or otherwise suitably connected to said disc 80 is a rubber disc 82 which is designed to bear directly against the hat block as shown in Figures 7 and 9. Between the bar 76 and the disc 80 are interposed springs 86. As the block 84 is forced into the hat crown under pressure applied to the disc 80 and rubber disc 82, the crown of the hat is slightly stretched. It is also given its correct shape and size. During this operation, steam may be admitted to the chamber 4 through the steam pipe 87 controlled by the valve 88, as clearly indicated in Figure 1.

It is to be noted that due to the firm holding of the brim by the saddle 56 and pressure ring 60 and stretching of the hat by the block, a very sharp line is produced at the meeting of the crown and brim since the edge of the hat mold at this point indicated by the reference character 89, Figure 9, is sharply defined.

There are a number of advantages which flow from this fact. In the first place the hat is given the correct shape and size to a greater degree of accuracy than in processes heretofore employed in the forming of hats of this type. Secondly, the leather sweat band can be stitched in more accurately, and lastly the band outside of the hat is more accurately fitted.

By reason of the method outlined by which the brim of the hat is first conformed to a brim shaping mold, the correct width of the brim and the correct width of the welt is obtained.

The brim mold 52 as shown in Figure 9 has a groove 54 so situated that the welted edge of the hat is formed on the upper side of the brim. It is obvious that this welted edge may be formed on both sides of the brim or on the lower side as desired.

In Figure 10, I have shown a modified form of mold and saddle 56 whereby the groove 92 is formed at the lower edge of the saddle 56, the mold also containing the groove 54 which is of less depth than in the construction shown in Figure 9.

In Figure 11 the groove 92 is shown in the saddle 56 only.

In Figure 12 no groove is shown. Such a construction is suitable for hats in which the edge is not provided with a welt.

After the hat has been formed by the process heretofore described, it, together with the wooden block may be put into what may be considered a modified brim flanging machine. This machine is in general similar to that shown in my Patent 1,991,921, granted February 19, 1935.

In the present instance, however, the machine of said patent is slightly modified, specific features of its modification being shown in Figure 13 which is a section of a portion of the hat flanging members. Referring to said figure, the brim mold 50 is similar in shape to the brim mold previously described. Since, however, the flanging operation acts to iron the brim and dry the same, a heating element 94, which may be similar to the heating element described in said patent, is introduced within the recess 96 of the brim mold. A similar heating element 98 is provided adjacent the saddle 56. The brim mold and saddle in this flanging mechanism may have the modifications shown in Figures 10, 11 and 12, depending on the type of the hat which is being formed.

What I claim is:

1. The method of forming a hat which consists in pressing parts of the marginal portion of an appropriate blank into yielding frictional contact with opposed parts of a brim-mold, the parts thus subjected to pressure being distributed throughout a zone extending around the mold

but spaced at a material distance inwardly of its outer margin, then adjusting the positions of portions of the part of the blank intended to serve as the brim of the hat to an extent such as to bring them into a desired brim-forming relationship with respect to the mold by the application of force sufficient to overcome the yielding frictional contact to which such portions are subjected, then pressing and unyieldingly holding against a peripheral brim-forming surface portion of said mold a portion of said blank extending about the zone of application of yielding pressure, and finally forming the crown of the hat by the application of means adapted to forcibly extend the inner unformed portion of the blank into space rendered accessible by an opening bounded by the inner margin of the mold to the extent permitted by the unyieldingly held peripheral portion of the brim and to shape and finish the same.

2. Those steps in the process of forming a felt hat from a blank, which consists in yieldingly holding the blank in contact with the brim forming mold at a substantial distance from the brim edge conforming the brim of the blank to the size and shape desired in the finished hat while thus yieldingly held, subsequently, firmly holding another portion of the brim so conformed and blocking the crown while the brim is thus firmly held.

3. Those steps in the process of forming a felt hat from a blank, which consists in first applying the blank to a brim shaping mold, then applying yielding pressure at a plurality of locations to an inner zone of the brim surrounding the crown and spaced from it, conforming the brim to the shape and size of the mold while the blank is subjected to said yielding pressure applying pressure to the outer zone of the brim beyond the area of the inner zone and subsequently blocking the crown while the brim is held by the pressure applied at the outer zone.

4. Those steps in the process of forming a felt hat from a blank, which consists in applying a blank to a brim shaping mold, applying yielding pressure to an inner zone of the brim surrounding the crown, applying pressure to an outer zone of the brim beyond the area of the inner zone while the brim is held at the inner zone, relieving the pressure at the inner zone and subsequently blocking the crown while the brim is held by the pressure applied at the outer zone.

5. In a hat forming machine, a brim mold of the size and shape of the brim of the hat to be formed, devices in the form of yielding presser fingers adapted to engage the brim of a hat adjacent to but spaced from the hat crown while the brim is in contact with the mold, means for engaging the outer portions of the brim beyond the zone engaged by the said fingers, while the brim is being held against the brim mold by the fingers, and means for disengaging the yielding pressure fingers from the hat brim while the outer portion of the brim is held against the mold.

GANDOLFO CIPRIANO