

Nov. 26, 1935.

E. F. SCHMIDT

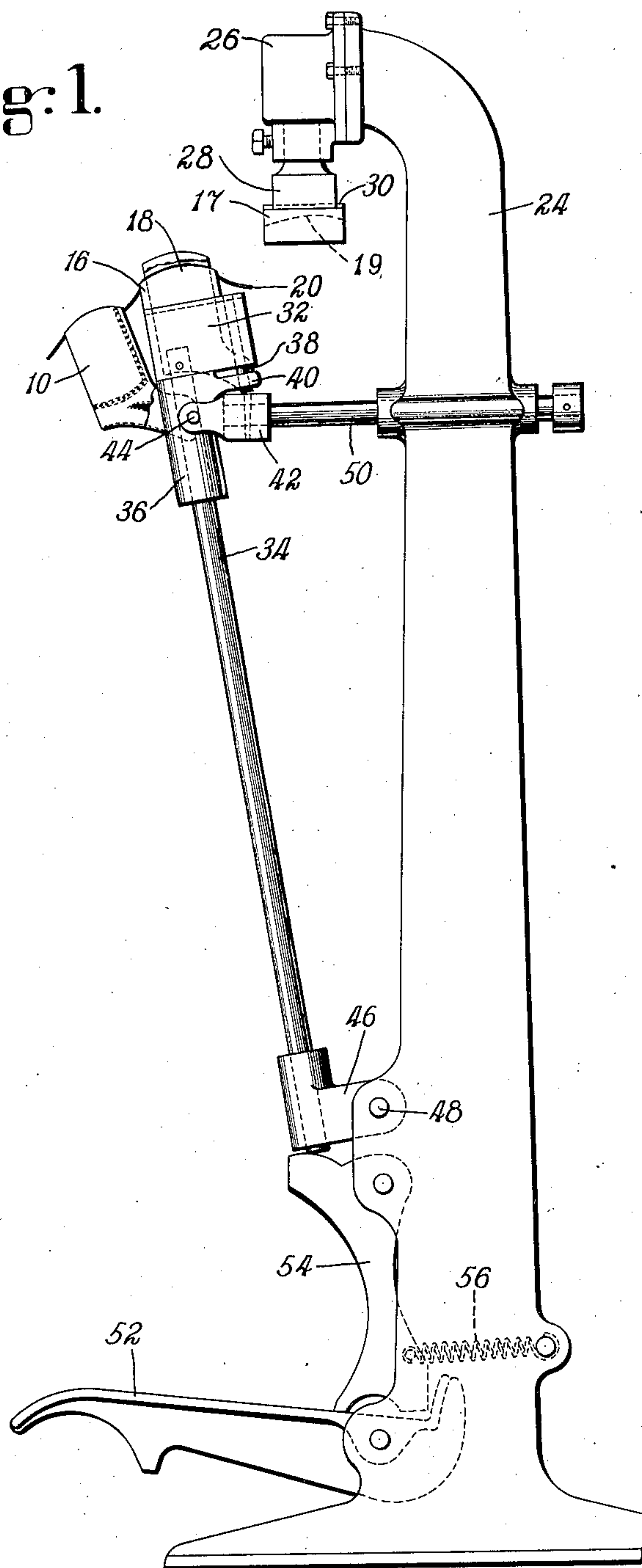
2,021,966

METHOD OF AND MACHINE FOR AFFIXING REENFORCING  
MEMBERS TO ARTICLES AND FOR PRESSING SEAMS

Filed Dec. 14, 1931

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

Fig. 3.

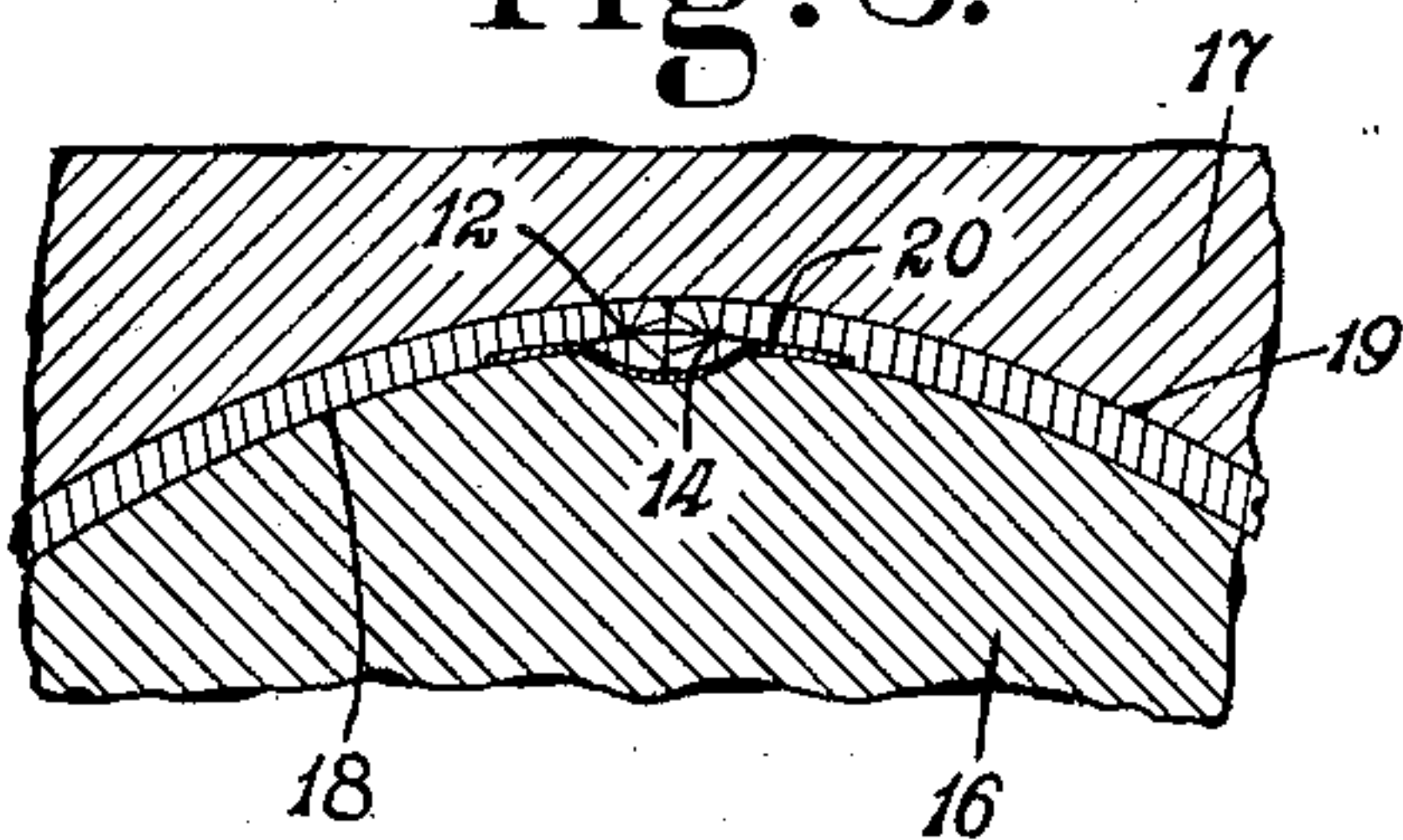


Fig. 2.

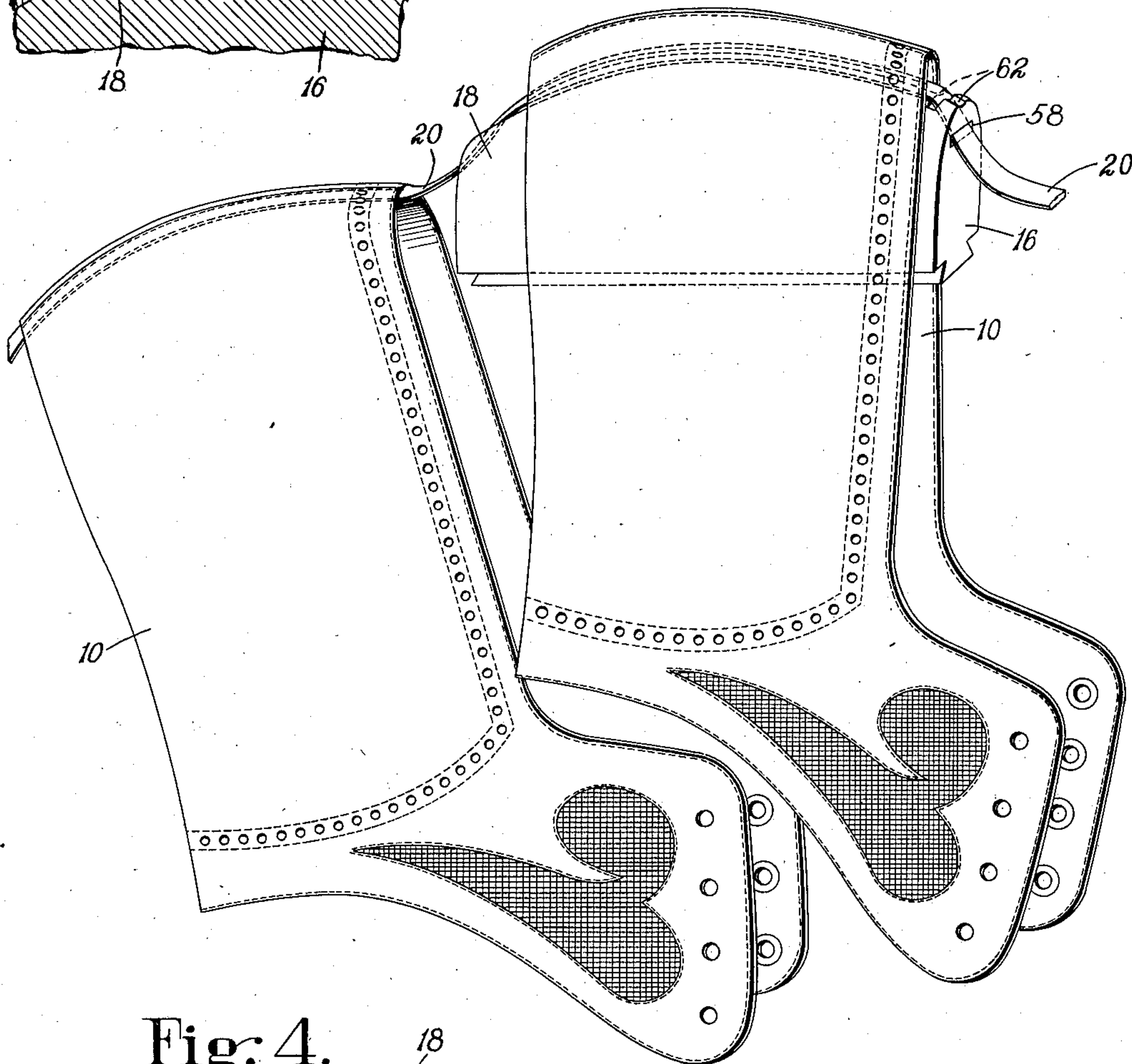
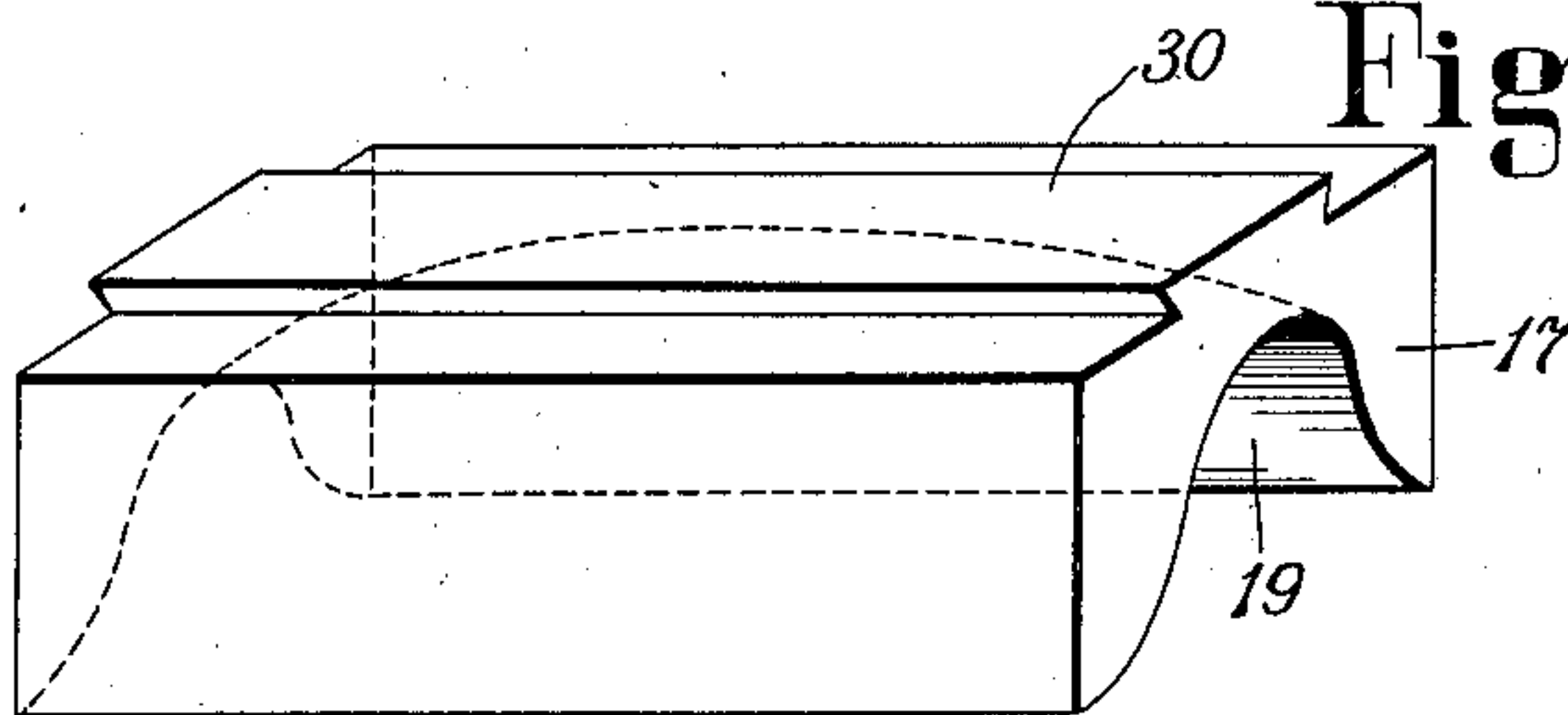
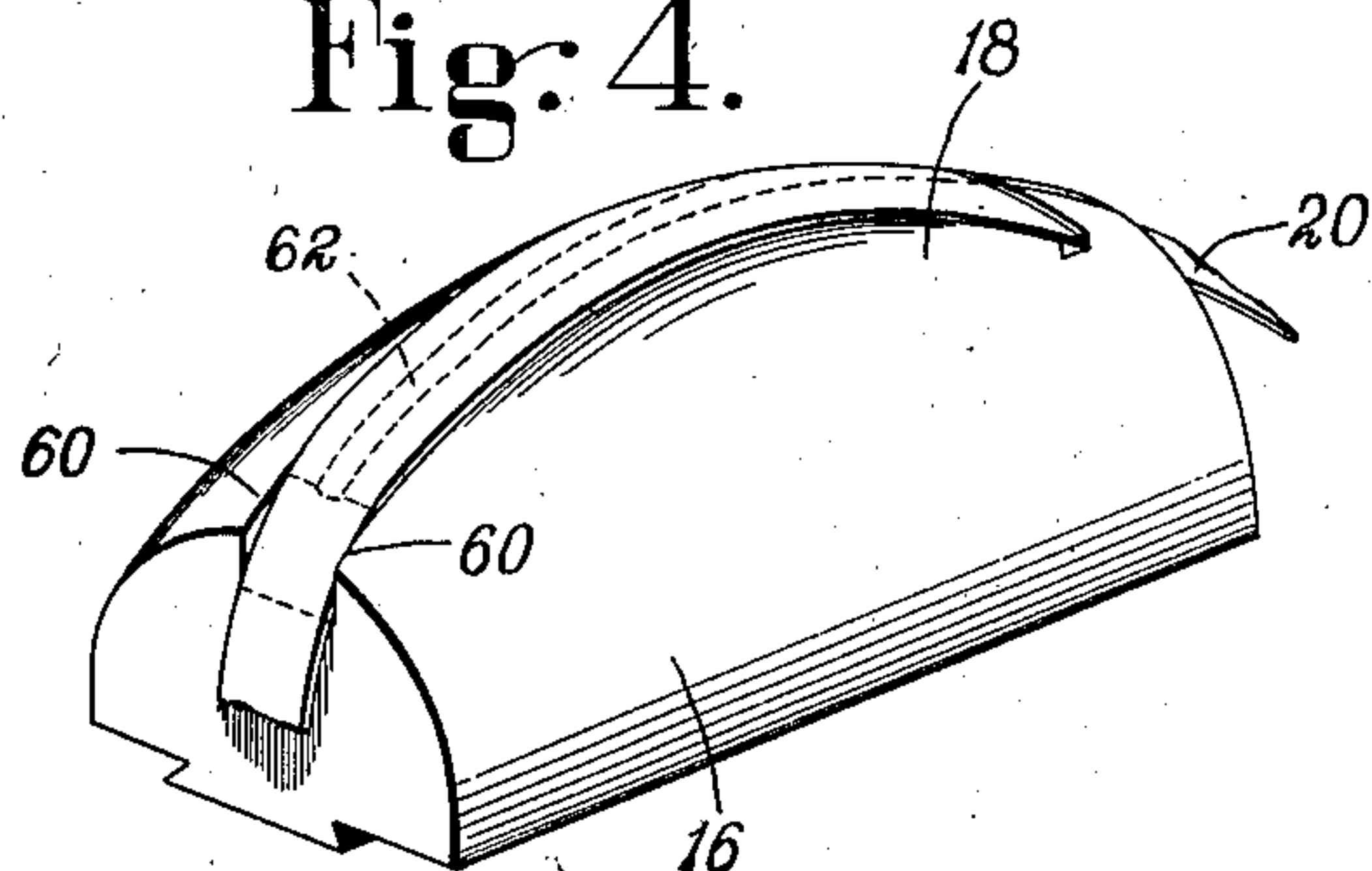


Fig. 4.



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## UNITED STATES PATENT OFFICE

2,021,966

METHOD OF AND MACHINE FOR AFFIXING  
REENFORCING MEMBERS TO ARTICLES  
AND FOR PRESSING SEAMSEckard F. Schmidt, Milwaukee, Wis., assignor to  
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18 Claims. (Cl. 12-51)

This invention relates to improved methods and machines for effecting the attachment of a reinforcing member to an article and for pressing seams and is herein exemplified with reference to shoemaking operations known as tape laying and seam pressing.

In the past, shoe parts, the principal surfaces of which are normally curved, have usually been deformed temporarily when subjected to these operations as contrasted with their normal form. This deformation commonly results in the shoe parts being turned "wrong-side-out", flattened to some extent, or otherwise misshaped while the tape laying or seam pressing is being carried out; and, as far as applicant is aware, these operations have always been performed heretofore by treating progressively the portions of the shoe parts which are to be thus worked.

On the other hand, the present invention contemplates the performance of these operations on shoe parts when in substantially the same form which they are to assume in the finished shoe, and also the treatment at once of the entire portion of the shoe part which is to be thus operated upon.

To this end the invention, considered in one aspect, contemplates an improved method of strengthening a piece of sheet material, such as a shoe part, which is to have a portion of predetermined shape in the finished article, such as a shoe, of which it is to form a part said method comprising imparting the desired shape to said portion, positioning a strengthening member, and the shaped portion in substantially the relative position they are to occupy in the finished article and applying pressure to the strengthening member and the piece of sheet material simultaneously at all points at which they are contiguous. The use of the above method greatly increases the rapidity of the tape laying operation as practiced heretofore, and as herein disclosed, the method is carried out by the use of an improved machine constituting one embodiment of important features of the invention.

In another aspect, therefore, the invention contemplates the provision of an improved machine by means of which the above method can be practiced and which as herein illustrated comprises a form the work engaging surface of which is shaped in accordance with the curvature of the inner surface of the portion of a curved shoe part to which a tape is to be affixed, and a cooperating form having a work engaging surface substantially complementary to that of

the first-mentioned form whereby the entire portion of the shoe part contiguous to the forms is treated at once when the forms are in juxtaposition, the first-mentioned form having means for positioning a tape centrally on its work engaging surface.

Although the invention relates, in one aspect, as indicated above, to the affixing of a strengthening member to a shaped piece of sheet material, it is exemplified herein with special reference to the taping of a seamed shoe part, an upper having a back seam having been selected for the purpose of illustration.

Thus, the invention in another aspect provides a method of operating upon seamed shoe parts which consists in shaping the shoe part adjacent to the seam into the form which it is to assume in the finished shoe, relatively positioning the tape and the seamed portion of the shoe with respect to each other in the relation which they are to have in the finished shoe, and causing pressure to be applied to the tape and the shoe part simultaneously throughout the extent of their contiguous surfaces, thereby to effect their adhesion.

If desired, seamed shoe parts may be subjected to a seam pressing operation only, as distinguished from a tape laying operation, and such an operation can be performed by moving the forms above referred to into juxtaposition, with a seamed shoe part disposed therebetween.

Thus, the present invention also contemplates the method of operating upon a seamed shoe part which comprises shaping the portion of the shoe part adjacent to the seam into the form which it is to assume in the finished shoe, and applying pressure simultaneously to the parts of a seam along its entire length in order to smooth and flatten the seam ridge.

Preferably the procedure last referred to is carried out by the use of a construction in which invention is to be recognized, and which as herein shown comprises a form the surface of which is shaped in accordance with the curvature of the inner surface of the portion of a shoe part adjacent to the back seam both longitudinally and widthwise thereof, and a cooperating form having a work engaging surface substantially complementary to that of said first-mentioned form whereby the entire portion of an upper including the back seam is operated upon simultaneously when the forms are in juxtaposition, the first-mentioned form being shaped and arranged to receive the seam ridge. As herein illustrated, the seam ridge is received in a longi-



tudinal groove in that form which is contiguous to the seam ridge; and thus the displacement of the portion of the shoe part constituting the seam ridge which results from the application of pressure thereto is controlled by the sides of the groove in the grooved form insuring that the seam will be uniformly shaped throughout its extent.

The invention contemplates not only improvements in the individual operations of taping and seam pressing referred to above, but also an improved method of tape laying in the performance of which the the seam pressing operation is carried out simultaneously with that which results in the application of a tape to the work piece, and also the method of laying a tape which comprises as a distinct step that of pressing the seam to be taped in accordance with the above method as a preliminary operation.

Thus, it is contemplated that the taping and flattening of a seam may be performed simultaneously with one application of pressure. To this end, a portion of a shoe part adjacent to the seam may first be shaped into the form which it is to have in the finished shoe, a tape may then be shaped into the form which it is to assume in the finished shoe, the tape and the seamed portion of the shoe may then be relatively positioned with respect to each other in the relation which they are to have in the finished shoe, and, finally, pressure may be applied to the tape and the shoe part simultaneously throughout the extent of their contiguous surfaces, thereby both to flatten the seam ridge and to effect adhesion of the tape and the shoe part at once. As a result of this procedure the tendency of the tape to pucker is minimized since both the tape and the work piece are first shaped into the form which they assume in the finished shoe before they are secured to each other.

If preferred, however, as above indicated, the portion of the shoe part adjacent to and including the seam may be shaped into the form it is to have in the finished shoe by a preliminary seam pressing operation, and then the tape may be shaped into the form which it is to assume in the finished shoe, the tape and the seamed portion of the shoe may be positioned with respect to each other in the relation which they are to have in the finished shoe, and finally pressure may be applied to the tape and the seamed part simultaneously throughout the extent of their contiguous surfaces, thereby to effect their adhesion.

These and other objects and features of the invention will appear more fully from the following description when read in connection with the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a side elevation of an illustrative machine embodying the invention;

Fig. 2 is a perspective view of forms employed in the illustrative machine and indicating the relation of a shoe part and a tape as they are about to be operated on by the forms;

Fig. 3 is an enlarged sectional view of the forms between which is disposed a seamed shoe part and a tape; and

Fig. 4 is a view in perspective showing the lower form and a tape normally positioned on the form as it appears when viewed from behind.

While the present invention may have utility with reference to any operation involved in the attachment of a reenforcing tape to an article,

it is disclosed herein with reference to shoe-making operations commonly known as tape laying and seam pressing. Either or both of these operations are commonly performed on various portions of shoe parts but, for the purpose of disclosing the present invention, it will be described with reference to operations known as back seam taping or pressing, the back seam being that which is found in the rearmost portion of a shoe upper which is usually curved both longitudinally and laterally of the seam in accordance with the shape of the heel portion of the foot.

The illustrated shoe part 10, a quarter, is composed of inner and outer elements which are secured together by stitching 12 and which, when in its normal form, has a ridge 14 extending from its concave surface, as indicated in Fig. 3. The ridge 14 will be termed hereinafter the "seam ridge." The present invention provides improved cooperating forms 16 and 17 which are constructed and arranged, as will be pointed out below, for effecting the adhesion of a tape 20 to the seam ridge 14 and the portions of the shoe parts 10 adjacent to it or for finishing the seam ridge 14 by merely pressing it. The above operations are performed by bringing the forms 16 and 17 into juxtaposition, a quarter and tape, or only a quarter, being disposed between the forms, and, while the forms may be incorporated in any suitable device which may be operated to provide such a relative movement, they are illustrated herein as embodied in a machine of the type disclosed in United States Letters Patent No. 441,980, granted to S. Ross, Jr., on December 2, 1890. This machine comprises a standard 24 in the head 26 of which is adjustably clamped a holder 28 for the form 17, the latter having a dovetailed portion 30 which fits within a correspondingly shaped groove in the holder 28. The lower form 16 is mounted in a holder 32 fixed on the upper end of a rod 34 slidably mounted in a sleeve 36, relative rotation between the sleeve 36 and the holder 32 being prevented by a pin 38 in the holder which passes through a guideway in a lug 40 which extends inwardly from the upper end of the sleeve 36. The sleeve 36 is supported vertically by means of a yoke 42 which is rotatably connected with the sleeve by means of trunnions 44. The lower end of the rod 34 is guided by an arm 46 pivotally mounted at 48 in the standard 24. On account of this pivotal mounting, the lower form 16 may be moved from a position of alinement with the upper form 18 into the position it occupies as illustrated in Fig. 1, to facilitate the positioning thereon of shoe parts to be treated. Lateral movement of the lower form 16 is prevented by a rod 50 carrying the yoke 42 at one end and being mounted for horizontal sliding movement in the standard 24. The lower form 16 is moved toward the form 18 by means of mechanism comprising a treadle 52 which, when depressed, swings a crank 54 in a clockwise direction, thereby raising the rod 34 the lower end of which it engages. A spring 56 normally urges the crank 54 in a counterclockwise direction, thereby normally to allow the form 16 to drop to its lowermost position when foot pressure is removed from the treadle.

The forms 16 and 17, as herein illustrated, have substantially complementary work engaging surfaces 18, 19 which are shaped respectively in accordance with the concave and convex surfaces of the shoe part 10 in the vicinity of the



back seam both longitudinally and widthwise of the seam. The forms, moreover, are arranged to operate on the entire length of the seam and hence, when brought into juxtaposition, treat the shoe part simultaneously throughout its heightwise extent. The illustrated machine is adapted for performing tape laying operations on account of the provision in the lower mold 16 of tape guiding channels in its ends. One channel is formed by tunneling completely between an end face of the form 16 and its work engaging face, providing a kind of eye 58 through which the tape 20 is threaded. The tape guiding channel at the other end of the form 16 is made by removing material from its work engaging surface so as to provide vertical shoulders 60 (Fig. 4) spaced by a distance somewhat greater than the width of the tape to allow the tape to move freely therebetween.

The uppermost portion of the work engaging surface 18 of the form 16 is provided with a groove 62 connecting the mid points of the channels at each end of the form. The groove, as herein illustrated in Fig. 3, is relatively shallow and evenly curved widthwise thereof and is wide enough to receive the ridges of back seams.

As above pointed out, the construction in which the present invention is embodied may be used either to lay tape, press seams, or to perform both of these operations simultaneously. In using the illustrated machine only for the purpose of pressing seams a shoe part is placed over the form 16 with the seam in alinement with the groove 62 and the portions of the shoe part adjacent to the seam fitting closely about the form on which there is no tape. The shoe part 10, which may have been removed from a stack in no particular shape, is thus manually formed substantially into the shape which it is to have in the finished shoe before the seam is pressed. The forms 16 and 17 are then moved into juxtaposition as by depressing the treadle 52 in the illustrated construction, the form 16 having previously been moved underneath the form 17, thereby causing the entire seam as well as portions of the shoe part adjacent to the seam to be acted upon at once throughout the heightwise extent of the shoe part.

The sides of the groove 62 form definite boundaries within which displacement of the portion of the shoe part in the seam ridge resulting from the pressure between the forms 16 and 17 is limited and insure that the seam ridge will be uniformly shaped throughout its length and flattened against the portion of the shoe part contiguous to the seam. It is apparent, moreover, in view of the fact that the seam is pressed while the portion of the shoe part including it is in its finished form when treated, that the form of the seam as pressed is not altered when the shoe part is assembled with others in a shoe.

When the illustrated machine is used to perform a tape laying operation, it may be operated first to perform a seam pressing operation on the shoe part to be taped, as described above, as a distinct step preliminarily to the tape applying operation. However, if it is desired both to lay tape and press a seam at once, a tape may be placed on the upper surface of the form 16 in the first instance, in which case the tape is applied to the work piece simultaneously throughout the extent of the work piece contiguous to the tape. The positioning of the tape on the lower form 16 at the beginning of a taping operation is performed manually, the tape being sup-

plied in a continuous strip from a roll (not illustrated in the drawings) which may be supported in a convenient location on the standard 24. The end of the strip is passed through the eye 58 and is led over the work engaging surface 18 of the form 16 and between the shoulders 60 of the channel opposite to the eye 58. The tape is thus shaped like the contiguous surface of the form 16 before the shoe part to which it is to be applied comes into contact with it.

The shoe part to be taped is then placed over the lower form 16, the seam ridge being in alinement with the tape, that is, directly over the groove 62. Finally, the forms 16 and 17 are moved into juxtaposition. This results in the simultaneous application of pressure to the tape, and the portion of the shoe part contiguous to the tape, whereby the seam ridge is flattened and the tape is adhesively secured to the shoe part over the seam and to portions of it adjacent to the seam. It is apparent, therefore, that the tape and the portion of the shoe part which are to be secured together, both having first been shaped to the form which they are to have in the finished shoe, may be pressed together by applying pressure simultaneously over their entire contiguous surfaces without causing any puckering of the tape on the shoe part and without necessitating any relative movement between the tape and the shoe part as they are pressed together in order to eliminate wrinkles or the like in the tape.

It is customary in performing taping operations of the type under discussion, to apply a number of shoe parts to a continuous length of tape, as indicated in Fig. 2. The weight of the taped shoe parts hang from the forward end of the form 16 tensions the tape to some extent, and thus further facilitates the shaping of the tape to the surface of the form.

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

1. That improvement in strengthening a piece of sheet material a portion of which is to have a predetermined shape in the finished article of which it is to form a part, which consists in imparting substantially the desired shape to the whole of said portion, positioning a strengthening member and the shaped portion in substantially the relative positions they are to occupy in the finished article, and applying pressure to the strengthening member and the piece of sheet material simultaneously throughout all points at which they are contiguous.

2. That method of operating on shoe parts which consists in shaping a shoe part into the form which it is to have in the finished shoe, positioning a tape and the shaped shoe part in the relative positions they are to have in the finished shoe, and applying pressure to the tape and the shoe part simultaneously throughout the extent of the shoe part contiguous to the tape in order to effect their adhesion.

3. That method of applying a tape to a shoe part which consists in relatively positioning a tape and a shoe part with respect to each other in the relation which they are to have in the finished shoe, and causing pressure to be applied to their contiguous surfaces simultaneously throughout the extent thereof while maintaining said surfaces in the shape they are to have in the finished shoe.

4. That method of applying a tape to a shoe part which consists in shaping the tape into the



form which it is to have in the finished shoe, shaping the shoe part into the form which it is to have in the finished shoe, relatively positioning said tape and shoe part with respect to each other in the relation which they are to have in the finished shoe, and causing pressure to be applied thereto simultaneously throughout the extent of their contiguous surfaces.

5. That method of operating on seamed shoe parts which consists in shaping the portion of the shoe part adjacent to the seam into the form which it is to have in the finished shoe, relatively positioning a tape and the seamed portion of the shoe with respect to each other in the relation which they are to have in the finished shoe, and causing pressure to be applied to the tape and the shoe part simultaneously throughout the extent of their contiguous surfaces thereby to effect their adhesion.

6. That method of applying tape to a seamed shoe part, which consists in shaping the portion of the shoe part adjacent to the seam into the form which it is to have in the finished shoe, shaping a tape into the form which it is to have in the finished shoe, relatively positioning the tape and the seamed portion of the shoe with respect to each other while in the relation which they are to have in the finished shoe, and causing pressure to be applied to the tape and the shoe part simultaneously throughout the extent of their contiguous surfaces thereby both to flatten the seam ridge and to effect the adhesion of the tape and the shoe part at once.

7. That method of applying tape to a seamed shoe part, which consists in pressing the portion of the shoe part adjacent to and including the seam into the form it is to have in the finished shoe, shaping a tape into the form which it is to have in the finished shoe, relatively positioning the tape and the seamed portion of the shoe with respect to each other in the relation which they are to have in the finished shoe, and causing pressure to be applied thereto simultaneously throughout the extent of their contiguous surfaces thereby to effect their adhesion.

8. That method of operating upon a seamed shoe part which consists in shaping the portion of the shoe part adjacent to the seam into the normally curved form both laterally and longitudinally of the seam which it is to have in the finished shoe, and applying pressure simultaneously to the seam along its entire length in order to smooth and flatten the seam ridge.

9. That method of operating upon a seamed shoe part which consists in applying pressure simultaneously to the entire length of the seam and the portion of the shoe part contiguous thereto in order to flatten the entire seam ridge at once while maintaining the portion of the shoe part adjacent to the seam in the normally curved shape both laterally and longitudinally of the seam it is to have in the finished shoe.

10. That method of operating upon a seamed shoe part which consists in shaping the portion of the shoe part adjacent to the seam into the normally curved form which it is to have in the finished shoe, applying pressure to the seam ridge throughout its lengthwise extent simultaneously, and limiting the displacement of the portion of the shoe part constituting the seam ridge laterally thereof which results from the application of pressure thereto.

11. In a machine for operating on seams, in combination, a form the surface of which is shaped in accordance with the curvature of the

inner surface of the portion of a shoe part adjacent to the back seam both longitudinally and width-wise thereof, and a cooperating form having a work-engaging surface which is substantially complementary to that of said first-mentioned form whereby all parts of the shoe part adjacent to the back seam are operated upon simultaneously when the forms are moved into juxtaposition, said first-mentioned form having a longitudinal groove shaped and arranged to receive the seam ridge.

12. In a machine for operating on seams, in combination, a form the surface of which is shaped in accordance with the curvature of the concave surface of the portion of the shoe part adjacent to the back seam, and a cooperating form having a work-engaging surface which is substantially complementary to that of said first-mentioned form whereby the entire portion of the shoe part, including the back seam, is operated upon simultaneously when the forms are moved into juxtaposition, said first-mentioned form also being shaped to receive the ridge of the back seam.

13. In a machine for operating on seams, in combination, a form the work-engaging surface of which is shaped in accordance with the normal curvature of the normally concave surface of the portion of a shoe part adjacent to the back seam and a cooperating form having a work-engaging surface substantially complementary to that of said first-mentioned form, said first-mentioned form comprising means for positioning an adhesive tape centrally on its work-engaging surface.

14. In a machine for operating on seams, in combination, a form the work-engaging surface of which is shaped in accordance with both the normal longitudinal and transverse curvatures of the inner surface of the portion of a shoe part adjacent to the back seam, and a cooperating form having a work-engaging surface substantially complementary to that of said first-mentioned form, said first-mentioned form comprising tape-receiving channels adapted to position an adhesive tape centrally on its work-engaging surface whereby the tape is adhesively attached to the back seam of the work in its normal state of curvature when the said forms are moved into juxtaposition.

15. A machine for operating on a seamed shoe part, said part being normally curved both longitudinally and widthwise of the seam, having in combination, a form having a work-engaging surface convexly curved both longitudinally and widthwise thereof in accordance with the curvature of the concave surface of the said shoe part, and a form having a work-engaging surface substantially complementary to that of said first-named form whereby the entire seamed portion of the work piece is operated upon simultaneously when said forms are in juxtaposition, said first-mentioned form having a seam ridge receiving groove extending longitudinally along its work-engaging surface.

16. A machine for applying adhesive tape to a seamed shoe part, said shoe part being normally curved both longitudinally and widthwise of the seam, having in combination, a form having a work-engaging surface convexly curved both longitudinally and widthwise thereof in accordance with the curvature of the concave surface of the said shoe part, and a form having a work-engaging surface substantially complementary to that of said first-named form whereby the entire



seamed portion of the work piece is operated upon simultaneously when said forms are in juxtaposition, said first-named form comprising tape-receiving channels adapted to position a tape centrally on said form whereby the tape is adhesively attached simultaneously throughout the entire length of the contiguous portion of the shoe part.

17. A machine for applying adhesive tape to a seamed shoe part, said shoe part being normally curved both longitudinally and widthwise of the seam, having in combination, a form having a work-engaging surface convexly curved both longitudinally and widthwise thereof in accordance with the curvature of the normally concave surface of the said shoe part, and a form having a work-engaging surface substantially complementary to that of said first-named form whereby the entire seamed portion of the work piece is operated upon simultaneously when said forms are in juxtaposition, said first-named form having a seam ridge receiving groove extending longitudinally along the central portion of its work-engaging surface, said first-named form having also tape receiving channels adapted to position an adhesive tape in alinement with said groove

whereby the tape is simultaneously affixed to the entire length of the portion of the shoe part adjacent to and including the seam when said forms are in juxtaposition.

18. A machine for operating on the portion of a shoe part including the back seam, a form having a work-engaging surface convexly curved in accordance with the normal longitudinal and widthwise curvature of the inner concave surface of the portion of a shoe part including the back seam, a second form the work-engaging surface of which is substantially complementary to that of said first-named form, said first-named form having a groove in the central portion of its work-engaging surface extending longitudinally thereof, and shaped to receive the ridge of the back seam, and a tape-receiving channel at each end of said first-named form arranged to position an adhesive tape on said form in alinement with said groove whereby the tape is simultaneously affixed to the entire length of the portion of the shoe part adjacent to and including the seam when said forms are in juxtaposition.

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