May 4, 1943. G. S. MARX 2,318,509

APPARATUS FOR THE MANUFACTURE OF SHOES

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Fig. 1,

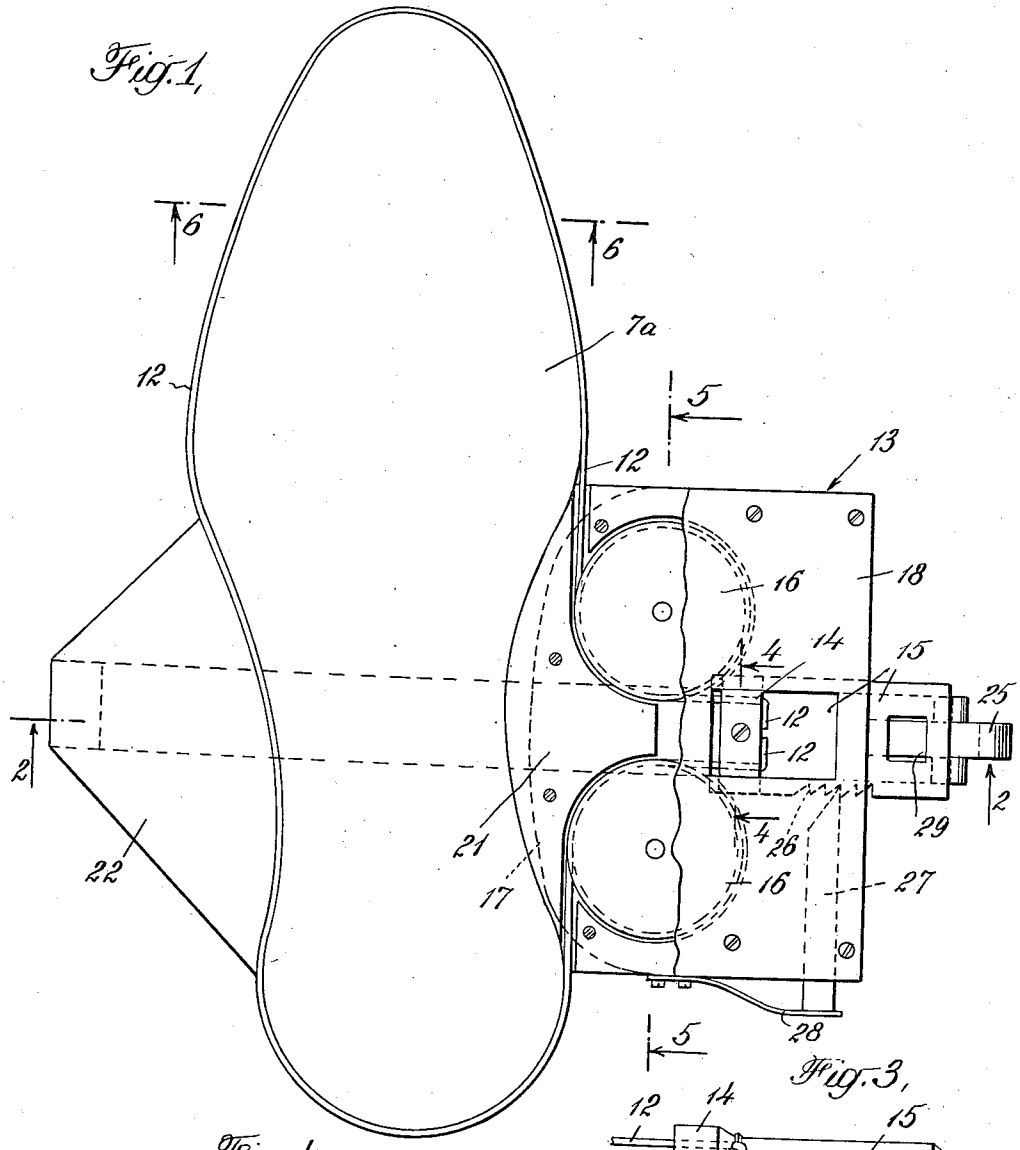


Fig. 3,

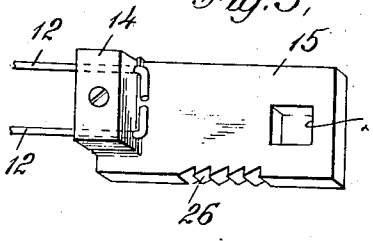
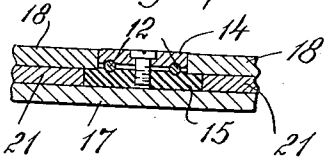


Fig. 4,



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Fig. 2,

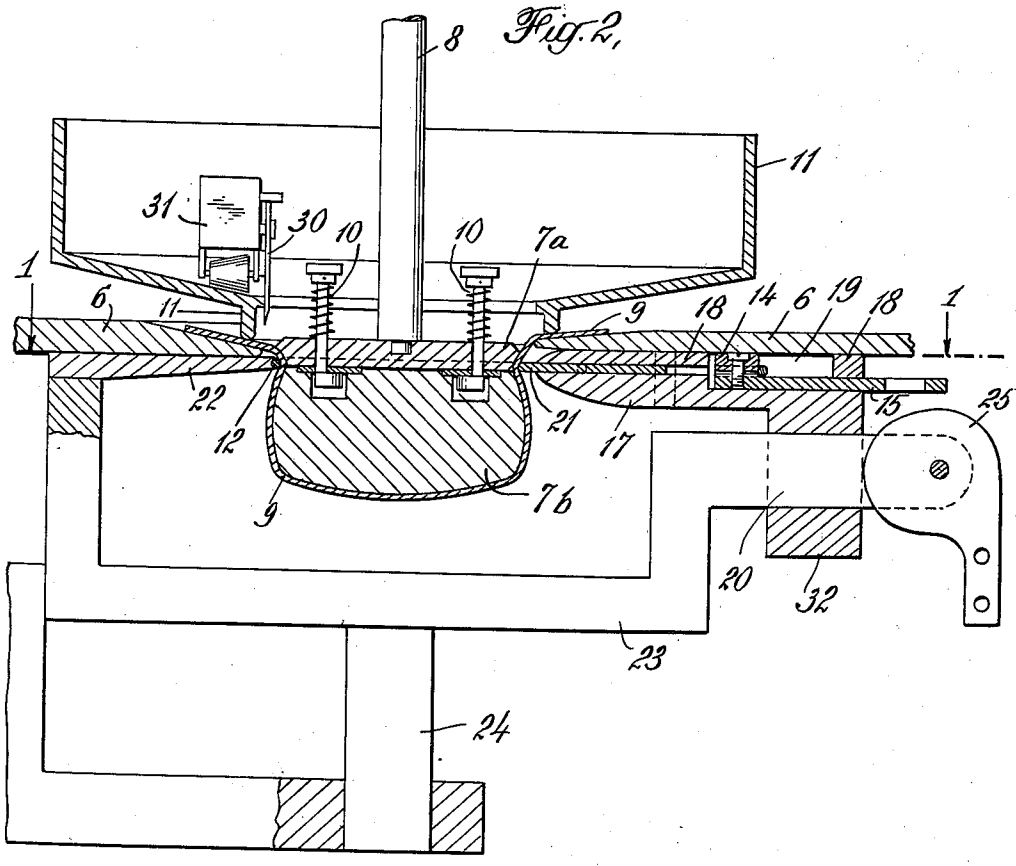


Fig. 5

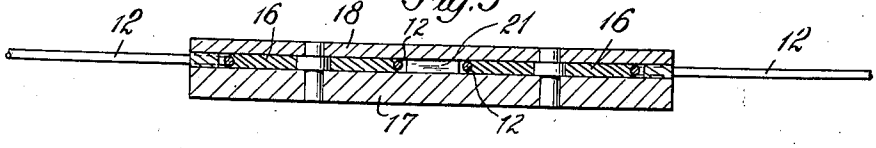
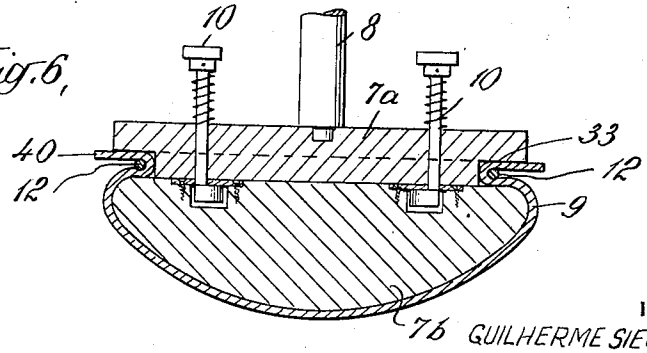


Fig. 6,



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Fig. 7,

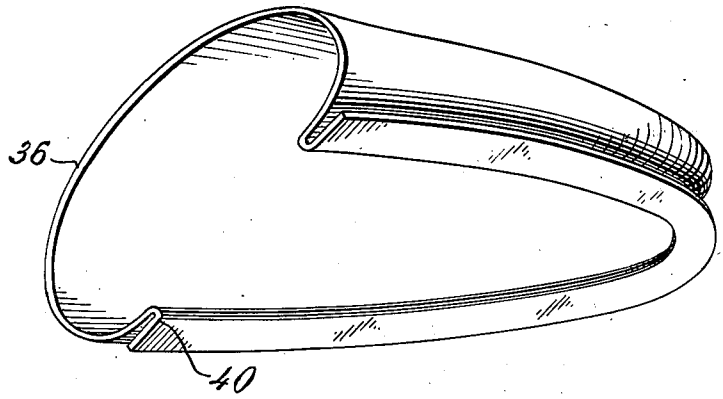


Fig. 8,

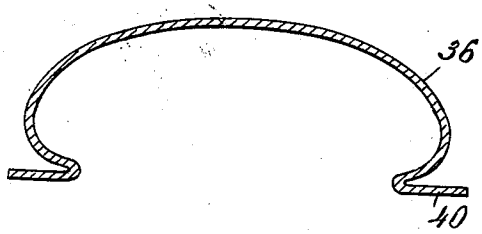


Fig. 9,

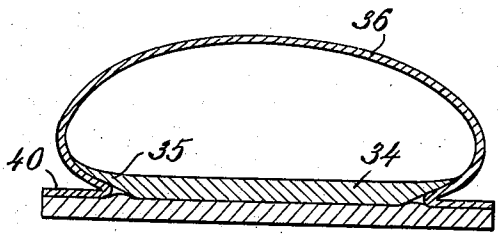
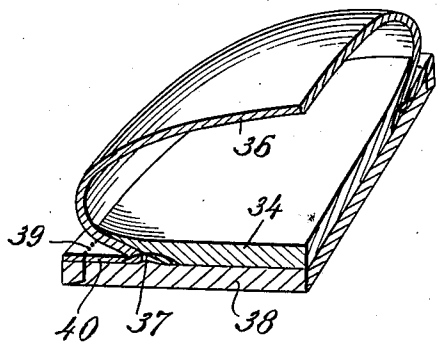


Fig. 10,



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UNITED STATES PATENT OFFICE

2,318,509

APPARATUS FOR THE MANUFACTURE OF SHOES

Guilherme Siegfried Marx, Hoboken, N. J.

Application August 30, 1941, Serial No. 408,947

7 Claims. (Cl. 12—7)

This invention relates to the manufacture of shoes, and more particularly to novel and improved apparatus for the manufacture of shoes, slippers, boots and moccasins and parts or sections thereof, including the lower continuous sections of moccasins or moccasin type shoes and boots, and including also a seamless type upper or toe portion having an improved bent in and outwardly extending welt section connected to the upper.

The apparatus of my invention may be used in making shoes and shoe parts from leather, and is with particular advantage employed in producing such articles from wet and pliable leather. The apparatus provides a means for molding wet and pliable leather over a last, and readily releasable means holding the leather in its molded position against the last until it is completely dry. The said releasable means is so constituted as to permit the removal of the last and molded leather from the remainder of the apparatus during the drying of the leather.

The leather may, with particular advantage, be brought to a wet and pliable state and then transformed into the referred to articles in accordance with the method for producing leather articles described and claimed in my copending application, Serial No. 360,631, filed October 10, 1940, now Patent No. 2,294,474, issued September 1, 1942. In the method there described, the leather is molded into the desired shape following a chrome tanning treatment and before the leather is permitted to dry following such treatment, and is thereafter held in its shaped position during drying. By this method the article acquires what may be termed a permanent "set" and has a greatly increased resistance to permanent deformation particularly when compared to articles made from sheets of leather which have been permitted to dry following chrome-tanning treatment and prior to being shaped or molded.

The apparatus of my invention comprises essentially a supporting table shaped in accordance with the shoe part to be produced, said table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed circumferentially of the aperture for slidably holding a sheet of leather on the surface of the table, a form or last adapted to be pressed through the said aperture, a flexible wire member positioned below the table and circumferentially around the form or last and near the top thereof (after the form has been pressed through the said aperture), and adjustable means for tightening the wire about the leather on the form or last and for mantaining the wire in a tightened condition, thus maintaining the shaped leather against the last or depressed in a recess in the last. While the form or last may be a single piece, it is preferable to have it comprise at least two interlocking sections, such for example as those described below. The apparatus may further include appropriately shaped plate members which are positioned in the same plane as the said wire member and which serve to augment the action of the wire in the production of certain types of shoes or shoe parts, the referred to adjustable means being operative to cause the plate members to bear on certain parts of the form or last concurrently with the wire. In another embodiment the apparatus functions to force the leather into a recess positioned circumferentially of the last, as will be more fully explained hereinafter.

One of the principal forms of shoe product which may be produced by my apparatus is a single piece lower section of a moccasin or moccasin type shoe. In the apparatus as adapted for such a purpose the last is pressed against the wet leather on the table and through the aperture in the table and the wire and holding plates applied near the top of the last to hold the leather in its shaped form during drying, which may be effected with the last in the table or removed therefrom.

In a further principal embodiment of the invention, apparatus is provided for shaping a seamless shoe upper or the forward or toe portion thereof around a last in which, adjacent the sole portion, there is a narrow circumferential recess or slot. The wire or the wire and plate members when applied to the leather on such a last force the leather into the laterally extending recess. There is thus produced in the upper, or portion thereof, an inwardly bent portion which is then bent sharply outwardly forming a particularly advantageous type of welt which is an integral part of the upper.

The apparatus of my invention, together with a shoe upper of the above mentioned type, will now be described with reference to the drawings which are presented as illutrative of particularly advantageous embodiments of my invention, and in which

Fig. 1 is a plan view of an apparatus for use in the manufacture of either moccasins or shoe parts;

Fig. 2 is a vertical section taken along the line

2—2 of Fig. 1, showing the apparatus in a form adapted for the production of moccasins;

Fig. 3 is an enlarged fragmentary perspective view of one element of the adjustable means for tightening the wire shown in Fig. 1;

Fig. 4 is a sectional detail taken along the line 4—4 of Fig. 1, showing the clamping means for holding the ends of the wire;

Fig. 5 is a vertical section taken along the line 5—5 of Fig. 1, showing a portion of the adjustable means for holding and tightening the wire;

Fig. 6 is a vertical section taken along the line 6—6 of Fig. 1, showing the cross section of an apparatus in accordance with another modification adapted to produce shoe uppers or toe sections thereof having a welt section connected to the upper;

Fig. 7 is a perspective view of a forward section of a shoe upper of the type produced by the apparatus illustrated in Fig. 6;

Fig. 8 is a vertical cross-section of such a shoe upper taken perpendicular to the axis of the upper;

Fig. 9 is a vertical cross-section of such a shoe upper after being attached to an inner and outer sole;

Fig. 10 is a perspective sectional view of the toe portion of an upper, of the type illustrated in Fig. 7, when attached to inner and outer soles showing the manner of attachment by stitching.

As illustrative of the apparatus of my invention, there is shown in Figs. 1–5 an appropriate mechanism for the pressing of wet leather to form a moccasin bottom section. The apparatus in accordance with this embodiment comprises the following elements. A table 6 having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe last which, as illustrated, is made up of two interconnecting sections 7*a* and 7*b* which may be rigidly connected by locking means 10. The last is provided with a supporting member 8 and is pressed against a sheet of leather 9 situated on the table until the top of the last is level with or slightly below the surface of the table. The leather is slidably held on the table adjacent the circumference of the aperture by the ring 11 which may be varied in weight in accordance with the type of leather being treated to give the necessary resistance to slippage. The leather after being shaped about the last is tightly held against the upper portion thereof by means of a wire 12. The pressure exerted by this wire may be varied by means of the adjustable mechanism 13 situated approximately opposite the mid-portion of the last. The ends of the wire 12 are, as shown in Figs. 3 and 4, secured between a block 14 and strip 15 and may readily be removed therefrom by loosening the block. In order to supply an even pressure over as great a portion of the circumference of the last as possible, the wire, before passing under the block 14, is passed around pulleys 16 mounted between plate members 17 and 18 on a line substantially parallel with the axis of the last, and in such a way that their inside edges are in substantial alignment with the outermost edges of the last. A suitable recessed opening 19 in the upper plate 18 is provided in which the block 14 reciprocates, the strip 15 reciprocating between the plates 17 and 18. A downwardly projecting extension 32 of the bottom plate 17 is provided with a suitably shaped aperture 20 and provides means for regulating the tension of the auxiliary plate members 21 and 22 positioned below the surface of the table and which, as shown in Figs. 1 and 2, exert a lateral supporting pressure against the cut-in side portions of the last which would not be effected by a mere tightening of the wire about the last. The plate 22 is rigidly connected to an arm 23 resting on support 24, said arm being shaped to avoid contact with the shoe last but arranged to pass through aperture 20. As will be seen from Fig. 2, plate 22 is provided with a grooved or notched edge which bears against the wire 12 and holds the same against one side of the last. The opposite plate 21 is situated between the two pulleys and bears directly against the side of the last. The arm member 23 passes through the aperture 20 and is pivotally connected to an eccentric 25 by the manipulation of which a lateral clamping action is secured on the plates 21 and 22. The strip 15 bearing notches 26 provides a means whereby the wire may be tightened and held in a tightened position by means of a ratchet stop 27 held in place by spring 28. The aperture 29 in strip 15 affords a means to receive a suitable tool for applying a tightening leverage to the wire. After the adjustable means 13 has been operated to tighten the wire and the plates 21 and 22 so that the leather is held firmly against the last, the leather is cut peripherally and exteriorly of the aperture in the table by a suitable cutting means which may be a single blade shaped slightly larger than the aperture, or preferably is, as illustrated, a small knife blade 30, activated by driving means 31 which as here shown rolls on the upper surface of ring 11. Following the cutting operation the shaped shoe while still held on the last by the clamping means and the wire is preferably removed from the table until the leather is dry and has assumed its permanent shape, thus freeing the table and cutting means for further use. The just described apparatus as illustrated in Figs. 1 to 5 is particularly effective for producing moccasin bottoms.

In the second above referred to principal embodiment of my invention, involving a seamless shoe upper having a welt portion as an integral part thereof, an apparatus such as is illustrated in Fig. 1 and Fig. 5, may be employed. In the case where a complete seamless upper is to be produced, a shoe last having a sole portion, as illustrated in Fig. 1, is employed. The same form of adjustable means shown in Fig. 1 for tightening the wire member and for adjusting the cooperating plates, may also be employed. The essential difference in this instance from the moccasin apparatus shown in section in Fig. 2, resides in the shape of the last and in the fact that an upper portion of the last made to conform generally to the cross-sectional configuration of the sole portion of the last, is cut away in such a way that when the upper plate 7*a* is secured to the last 7*b* by a locking means 10, a lateral recess 33 extending peripherally of the last is produced. Such a structure is illustrated in Fig. 6 which is a vertical section taken through the forward portion of the last along the line 6—6 of Fig. 1. As illustrated in Fig. 6, the wire member 12 when tightened by adjustable means 13 forces the leather into the recess 33, thus producing a welt section which is bent outwardly

upon itself. Fig. 8 illustrates in section the toe portion of such an upper.

It may sometimes be desirable to prepare only the forward portion of a seamless upper having an outwardly continuously extending welt portion. Fig. 7 illustrates such a portion which is used with advantage in many types of sport and work shoes, particularly those requiring heavy leather.

An apparatus for producing the forward or toe portion of such an upper will in general correspond to that illustrated in Figs. 1 and 6, except that the cooperating plates **21** and **22** will be omitted, the adjustable means for tightening the wire **12** being sufficient to force the wire into the recess **33** throughout the toe portion.

One of the chief advantages of the type of seamless upper or toe part thereof made by my apparatus resides in the manner in which a waterproof shoe may be prepared therefrom. In Figs. 9 and 10 is shown the manner in which such a shoe may be assembled when the portion of the upper involved possesses a welt portion **40** of the referred to type. An inner sole **34** having its outer edges tapered as at **35**, is placed within the upper **36**. Due to the manner in which the upper is bent outwardly to form the welt portion, the upper may be sewn to the inner sole as shown at **37**. The outer sole **38** may then be attached by known methods of sewing adjacent the outer edge of the welt portion, as at **39**. It will be seen that such an arrangement permits of a sturdily constructed shoe without having any nail or thread holes which pass from the exterior to the interior of the shoe.

It will be apparent that details of the various elements of the above specifically described apparatus may be varied without departing from the disclosure of the herein claimed invention.

I claim:

1. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, and an adjustable tightening means for tightening the wire member about the last.

2. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, an adjustable tightening means for tightening the wire member about the last, and cutting means for cutting the leather substantially peripherally of the aperture in the table.

3. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, horizontal plate members positioned on opposite sides of the last having convex inner edges which conform to the concave surface of the shoe last substantially in the plane of the said wire member, an adjustable tightening means for tightening the wire member about the last and for simultaneously pressing the said plate members against the opposing central sections of the last, and cutting means for cutting the leather substantially peripherally of the aperture in the table.

4. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, said last comprising an upper and lower portion releasably interconnected, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, an adjustable tightening means for tightening the wire member about the last, and cutting means for cutting the leather substantially peripherally of the aperture in the table.

5. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, horizontal plate members positioned on opposite sides of the last having convex inner edges which conform to the concave surface of the shoe last substantially in the plane of the said wire member, an adjustable tightening means for tightening the wire member about the last, and a clamping means for pressing the

said plate members against the opposing central sections of the last.

6. An apparatus for the manufacture of shaped shoe uppers comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe upper to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be pressed through the said aperture and having a contour corresponding to the contour of the shoe upper to be produced, said last having a recess extending peripherally around the last near the top thereof, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather and to force the shaped leather into the said recess, an adjustable tightening means for tightening the wire member about the last, and cutting means for cutting the leather substantially peripherally of the aperture in the table.

7. An apparatus for the manufacture of shaped shoe parts comprising a supporting table having an aperture corresponding in shape to but slightly larger than the transverse section of the shoe part to be produced, holding means disposed peripherally of the aperture for slidably holding a sheet of leather on the surface of the table, a last adapted to be passed through the said aperture and having a contour corresponding to the contour of the shoe part to be produced and adapted to shape a portion of the leather to conform to the shape of the last by pressing it through the aperture, a wire member positioned below the surface of the table and adapted to be tightened around the shaped leather on the last and adjacent the top thereof, an adjustable tightening means for tightening the wire member about the last, and cutting means for cutting the leather substantially peripherally of the aperture in the table, the last with the shaped leather thereon and the wire member tightened around the shaped leather together with said tightening means being removable from said table as a unit.

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