May 13, 1930. F. KELNHOFER 1,758,706

LAST

Filed Aug. 18, 1927

Fig. 2

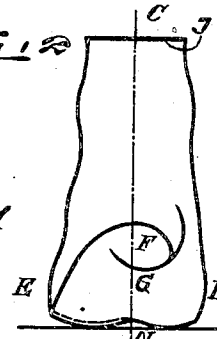


Fig. 1

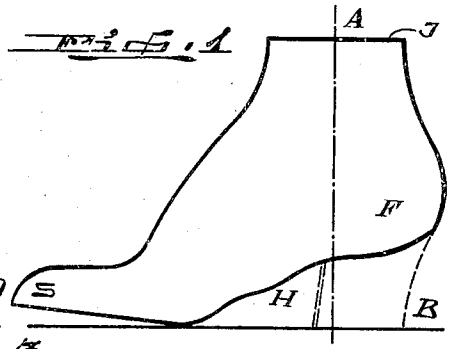


Fig. 11

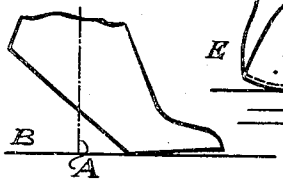


Fig. 3

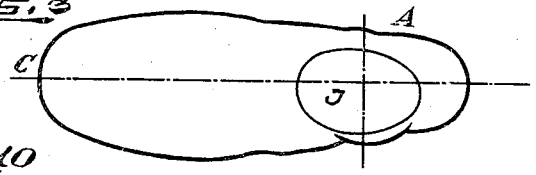


Fig. 10

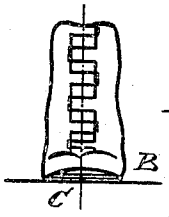


Fig. 4

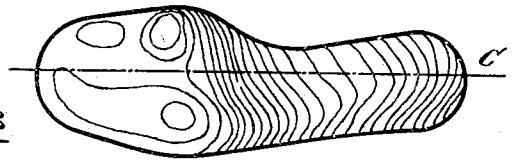


Fig. 6

Fig. 5

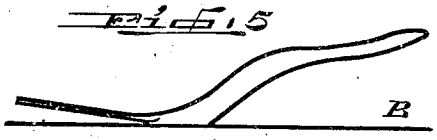


Fig. 7

Fig. 8

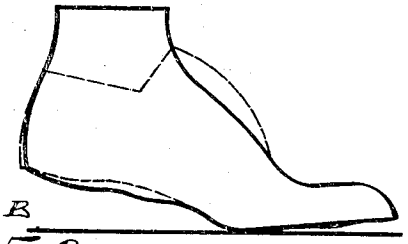
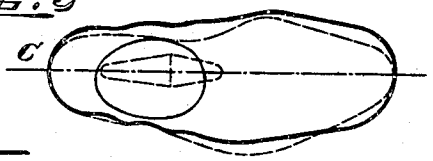


Fig. 9



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UNITED STATES PATENT OFFICE

FRANZ KELNHOFER, OF VIENNA, AUSTRIA

LAST

Application filed August 18, 1927, Serial No. 213,764, and in Austria September 16, 1926.

This invention relates to a method of producing footwear lasts.

It is a known fact that ordinary commercial footwear, whether produced by hand or by factory processes, generally speaking not only does not conform to set requirements, but often also is contributory to crippling of the feet.

One of the main reasons for this deficiency and liability is that the usual manner of taking measurements for producing lasts or footwear itself is based on a false fundamental basis. This manner of taking measurements hitherto only consisted in ascertaining the length round the foot at various places without considering the position of the foot and without paying exact regard to the anatomical construction of the feet.

According to the present invention the construction of footwear lasts is carried out with stricter reference to the anatomy of the feet.

In this respect attention is paid above all that the foot in order to permit of its measurement is brought into a basic position. This basic position is such that the axis of the foot runs parallel to the main plane of symmetry of the body. Thus the vertical plane containing the axis of the foot cuts the centre of the ball joint, the ankle joint, and the knee and hip joints.

In this basic position the leg must be so placed that a vertical plane, which is perpendicular to the beforementioned vertical plane, passes through the ankle, knee and hip joints.

It is further essential in the production of footwear lasts according to the present invention that the longitudinal sections through the lasts are adapted completely to the anatomic construction of the foot. In ordinary lasts the longitudinal sections are distorted in such a fashion that the shoes or boots cannot be made to fit correctly.

Reference will now be made to the accompanying drawings wherein:—

Figure 1 is a side elevation of a last with the foot in a position of average height and with a heel placed thereunder,

Figure 2 is a rear view,

Figure 3 is a plan view corresponding thereto,

Figure 4 is an internal view of a sinuated insole for use with the last,

Figure 5 is a side view of the in-sole,

Figure 6 is an internal view of a last complete with leg, the dotted portion indicating the leg guide of the boot tree as hitherto made,

Figure 7 is a view showing the sectional contour of a last with a low heel, the dotted lines representing the last as previously made and the full lines as made according to the present invention,

Figure 8 is a side view of the two contours at the height of an average heel,

Figure 9 is a plan view of the same with a high heel,

Figure 10 is a front elevation of a last filled with compressed air, and

Figure 11 is a side view of a fulling last.

As shown in the drawing the last is built on a vertical plane A, which extends from a point on a horizontal plane B through the ankle, knee and hip joints, and on a plane C (Figure 2) which extends along the axis of the foot through the centre of the ball joint N, ankle, knee and hip joints.

A last (Figures 1, 2, 3) is, according to the invention, provided at a position of average height of the foot with a forward last tip S corresponding to the length of the foot. The special last tips, which project over the actual length of the foot, and which in all lasts render possible every form of fashion, can no longer adversely affect the distribution of the mass of the last.

The cavity G in the joint of the foot (Fig. 2) is supported in such a manner, that the foot is somewhat raised and thereby the length of the last shortened, and also the distance between the inner ball D and outer ball E is reduced.

The heel F of the last is, corresponding to the heel bone, raised somewhat on the outer side in relation to the inner side and falls away in all directions from its highest point to the outline of the in-sole.

At the region where the heel merges into

the joint the last is formed in such a manner that the foot is specially supported by the boot. In the last the further precaution must be observed that there be sufficient space for the fifth instep bone.

By shaping the last as above set forth the whole foot sole is uniformly supported and the load uniformly distributed. The toe part is bulged from the ball of the large toe in a straight line towards the front similarly to the ball of the foot.

On the outside the region of the toe is likewise bulged at the ball and this bulge is due solely to the cavity G and is flattened at the edge of the sole of the last (Figure 3).

The outer ball is somewhat raised as indicated by the dotted line in Figure 2 of the drawing in order to facilitate a straight oblique direction.

By the arrangement of a plane top surface J (Figures 1 and 2) of the last parallel to the base line B there is facilitated the correct positioning of the last when making the boot or shoe.

Whilst hitherto only the toe part of a last was adapted to the purpose of use of the boot, according to the present invention, the sole as well as the remaining part of the last is varied according to the purpose of use of the boot, when the boot or shoe is intended for a special purpose of use.

In certain kinds of work intended for special purposes it is imposible under certain circumstances to use a last having a sinuated sole. In lasts therefore which in consequence of their purpose of use do not permit of the sinuated sole, the soles of the lasts must be kept flat. The sides of the lasts and the upper construction must, however, remain unchanged since after the footwear is completed an in-sole (Figure 5) is inserted which has the sinuations corresponding to the purpose of use.

The production of footwear lasts having sinuated soles was rendered difficult. In order to facilitate matters finished in-soles are produced which supplement the sinuations of the sole of the last and which are flattened on the working side.

Figure 4 shows the internal view of an in-sole which is produced as a supplement to a last having a flat sole.

Figure 6 shows a boot last according to the invention seen from within.

In contradistinction to the boot lasts as hitherto made and to the associated upright trees necessary for the production of the boot the last according to the invention is constructed with a leg part which corresponds to the form of the human leg. This leg portion can obviously be built up in any desired number of sections. The form of the legging last likewise corresponds to the shape of the human leg like the leg part of the boot last. The legging last is in the region of the instep enlarged adjacent the leg part of the boot and the range of movement of the foot correspondingly increased. According to the present invention the filling stretching trees are made in all parts according to the distribution of the body of the last with the exception that they supplement the shoe in its height.

The air filler Figure 10 is according to the present invention manufactured in such a way that its air-tight side wall which is interrupted by notches for the purpose of introducing the foot wear is occluded at the interrupted places above as well as below with a flexible air tight material. Thereby the firm wall is completely adapted to the body formation of the last. The principle of the fulling last (Figure 11) consists therein that the same in general has the form and shape of the other last according to the invention with the difference, however, that the necessary body enlargement for facilitating operations is provided at the felt discharge positions. It is thereby possible to full every kind of foot and leg covering from completed or united parts corresponding exactly to the purpose of use.

In the production of foot wear wherein fulling lasts are employed the upper part can be lasted at any desired place on the body of the last. When it is not a question of lasting the sole of the last the upper part is completed after completion of the boot. These lasted lasts have according to the purpose of use either the sinuated or flat last soles.

In the production of boots for gliding lasts are employed which are supplemented above, like the boot last (Figure 6) and which have the necessary width in the direction of glide.

I claim:—

A footwear last having a bottom face comprising a heel portion, shank portion and fore part, with a dip curve in the shank portion at a position where the fifth metatarsal bone would normally be positioned in a shoe, outwardly bulged portions at both sides of the fore part of the last, the bulge at the outer side of the last being higher than the bulge at the inner side of the last.

In testimony whereof I have signed my name to this specification.

FRANZ KELNHOFER.