W. M. HALBACH.

MEANS FOR USE IN THE FITTING OF SHOES.

APPLICATION FILED OCT. 7, 1919.

1,338,623. **Patented Apr. 27, 1920.**

2 SHEETS—SHEET 1.

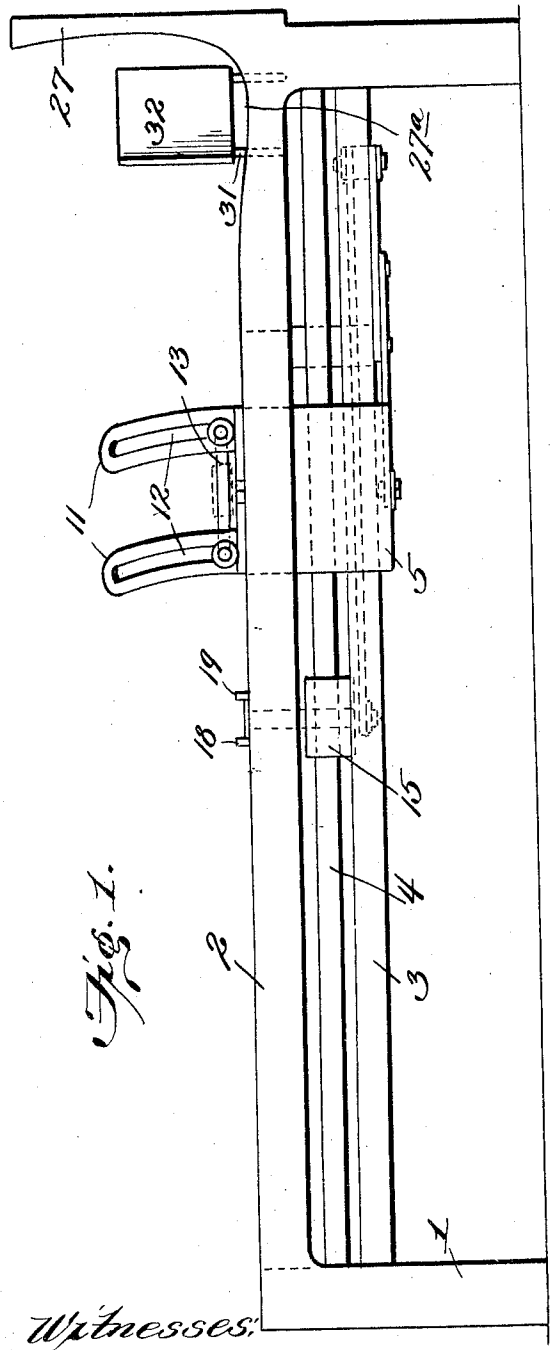


Fig. 1.

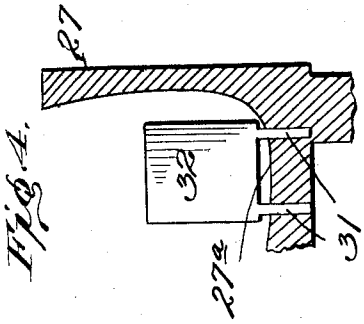


Fig. 4.

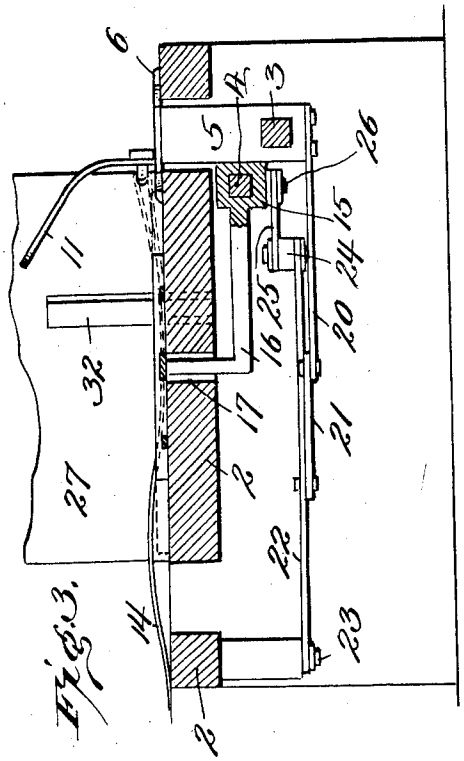


Fig. 3.

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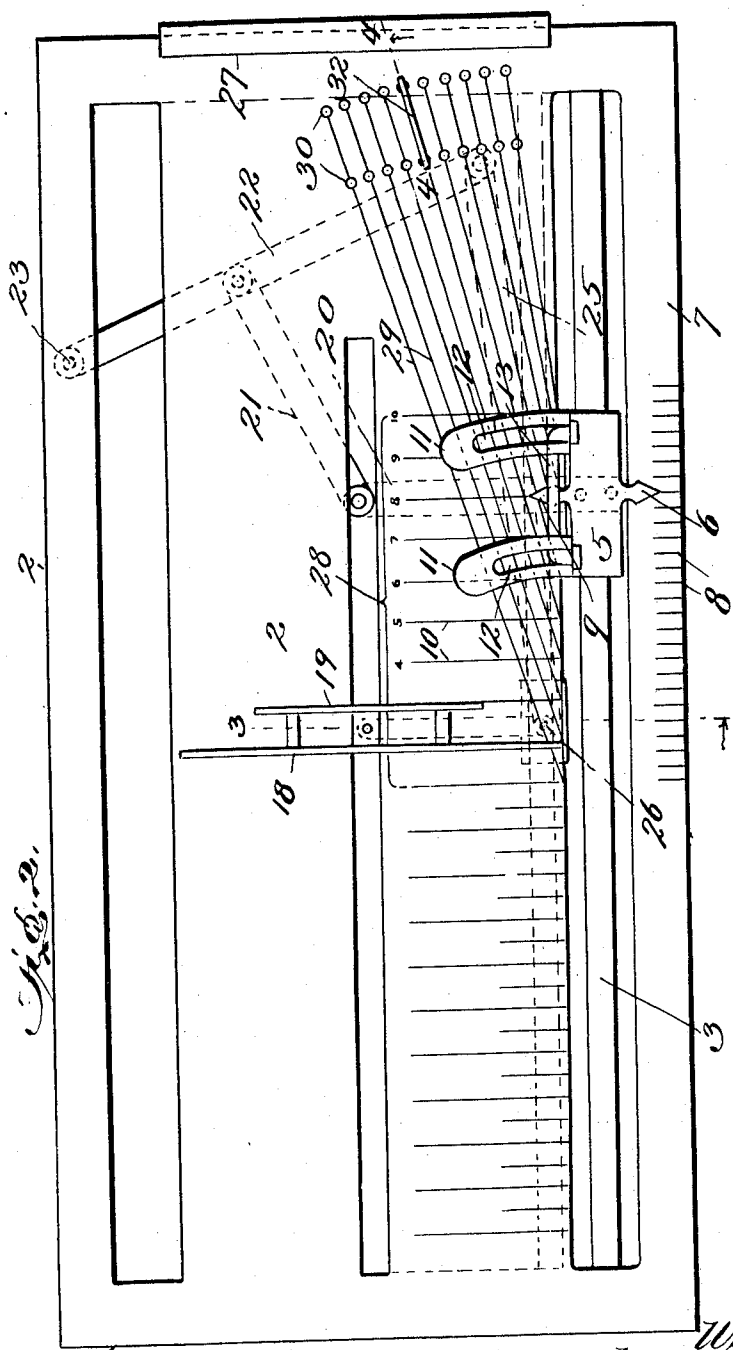


Fig. 2.

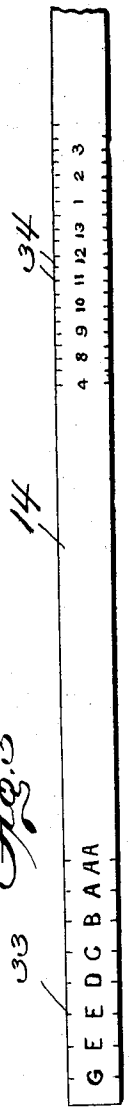


Fig. 5.

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UNITED STATES PATENT OFFICE.

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MEANS FOR USE IN THE FITTING OF SHOES.

1,338,623. Specification of Letters Patent. Patented Apr. 27, 1920.

Application filed October 7, 1919. Serial No. 329,137.

To all whom it may concern:

Be it known that I, WILLIAM M. HALBACH, a citizen of the United States of America, residing at Zurich, Switzerland, have invented certain new and useful Improvements in Means for Use in the Fitting of Shoes, of which the following is a specification.

The present invention relates to means for fitting boots or shoes upon the human foot and the primary object of the invention is to provide a device whereby shoes may be fitted correctly and comfortably.

Heretofore in fitting shoes the length of the foot is usually determined by measuring the distance from the rear of the heel to the point of the great toe and the width of the foot has been determined by passing a measuring strip, having suitable graduations, around the foot adjacent to the ball thereof, the shoe number being then ascertained with reference to the length and width measurements so determined. Such a method of ascertaining shoe numbers, however, rarely results in the fitting of shoes which will properly support the foot, for the following reasons. The shank of the shoe is so shaped relatively to the arch of the foot that contact between the arch of the foot and the shank of the shoe is possible only when the shoe fits the foot perfectly, in which case the ball of the foot will lie exactly at the end of the shank of the shoe. The principal difficulty in the correct fitting of shoes is due to the fact that in many cases the length or the arch of the foot is the same, but the toes are of different lengths. Obviously where shoes are fitted according to the length of the foot from the heel to the point of the great toe, one having a short great toe may purchase a shoe having a shank of the correct length, but the total length of the shoe from the end of the heel to the point of the toe will be too great and hence the portion of the shoe in which his arch is to be supported is too long and in such case the purchaser demands a shorter shoe, in which case the ball of the foot will be supported beyond the shank of the shoe, that is to say, the ball of the foot will rest too far forward, thus leaving a portion of his arch unsupported. This incorrect method of fitting shoes results in flat-foot or broken arch. If, on the other hand, the purchaser has a long great toe, he would then procure a shoe in which the ball of his foot will lie too far to the rear and in that case the arch of the foot would be unsupported, the foot then having a tendency to push forward in the shoe, causing the foot to recede from the counter.

It is therefore evident that the proper and comfortable fit of a shoe depends not upon whether the length of the shoe corresponds with that of the total length of the foot, but rather upon whether the shank of the shoe, which supports the arch of the foot between the heel and the center of the ball thereof, corresponds exactly to the distance between the end of the heel and the center of the ball of the foot which the shoe is to fit. The present invention provides means for insuring correct fitting of shoes, the length of the shank of the shoe being determined by the length of the foot between the rear of the heel and the center of the ball of the foot, and the length of the toe or forepart of the shoe being determined by the relative length of the great toe of the foot to which the shoe is to be fitted.

To these and other ends the invention consists in certain improvements and combinations and arrangements of parts, all as will be hereinafter described, the features of novelty being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing which shows the preferred embodiment of the device used in carrying out the invention:—

Figure 1 is a side elevation of the device for determining the measurements of the foot.

Fig. 2 is a top plan view of the device shown in Fig. 1.

Fig. 3 represents a cross-section on the line 3—3 of Fig. 2.

Fig. 4 represents a section on the line 4—4, Fig. 2.

Fig. 5 is a detail view of the measuring strip for determining the proper width of the shoe.

Similar parts are designated by the same reference characters in the several views.

In the present instance the device for determining the measurements of the foot comprises a suitable frame 1 having a foot board 2 thereon and rails 3 and 4 which extend longitudinally of the frame and parallel to the foot board. A slide 5 is movable longitudinally on the rail 3, this slide car-

rying a pointer or indicator 6 which overlies the part 7 of the frame and coöperates with suitable graduations 8 thereon. The slide 5 carries a second pointer 9 which cooperates with graduations 10 formed on the upper side of the foot rest 2. The slide 5 also carries a pair of upwardly extending arms 11 which are preferably bent to partially overlie the foot rest 2, as will appear from Fig. 3, and these arms are inclined toward the front of the foot rest, they being placed at an angle, for example, of 83° with the foot rest. The arms 11 constitute in effect a fork, the distance between these arms being so determined that the ball of the foot may lie freely in the space between these arms. The arms are formed with slots 12 in which the ends of a yoke 13 may slide, this yoke having one end of a measuring strip 14 attached thereto. If desired, a set screw or other suitable means may be provided for holding the slide 5 at any adjusted position along the rail 3, it being understood that the slide 5 is manipulated manually to bring it into position where the arms 11 will be set equidistantly in front and rear of the ball of the foot. A second slide 15 is guided to move longitudinally on the rail 4, this slide having a rigid arm 16 attached thereto and extending upwardly through a slot 17 in the foot rest 2, this arm 16 being attached to an indicating device which comprises two parallel arms 18 and 19, which extend across the top of the foot rest, the arm 18 being longer than the arm 19 and the distance between these arms corresponding substantially to the extreme difference, which experience has shown to exist, in feet having the same measurement from the end of the heel to the ball of the foot, but different toe lengths.

The slides 5 and 15 are operatively connected by mechanism which will cause the toe measuring slide embodying the arms 18 and 19 to be shifted in a predetermined ratio when the ball measuring slide 5 is set relatively to the ball of a foot on the foot rest. The motion transmitting means between the slides, as shown in the present instance, comprises an arm 20 which is rigidly attached to the ball slide 5, a link 21 which is pivotally connected at one end to the arm 20 and at its opposite end to a lever 22, the latter being pivotally connected at 23 to the framework and having its free end pivotally connected at 24 to a link 25, the forward end of said link being pivotally connected at 26 to the toe measuring slide 15. By this arrangement, when the ball slide 5 is properly set in relation to the ball of the foot, the toe measuring slide will be automatically set to indicate the extreme length of such foot and by reference to the long and short arms 18 and 19, it may be determined whether the toe of the foot undergoing measurement is long or short relatively to its measurement from the end of the heel to the ball. An upstanding heel rest 27 is preferably provided at the rear end of the foot rest, and the upper surface of the foot rest adjacent to this heel support is preferably grooved or concave as at 27ª in order that the heel of the foot may be well supported on the foot rest. The graduations 10 are spaced at suitable intervals longitudinally and the graduations within the bracket 28 are connected by lines 29 to suitably determined points on the heel supporting portion of the foot rest. Pairs of holes or sockets 30 are formed coincidentally with the respective lines 29 to receive the pins 31 attached to a lateral heel guide or support 32 so that the heel guide 32 may be set in alinement with any one of the lines 29. The heel guide 32 serves to position the heel of the foot in a direction laterally of the foot rest, it being obvious that in measuring a large foot, the heel must be offset from the edge of the board for a greater distance than is the case when a small foot is being measured, in order that the foot, irrespective of its size, will occupy a position in parallelism with the foot rest when the ball of the foot is positioned in the fork formed by the arms 11.

The width of the shoe is determined by the flexible measuring band 14, one end of which is attached to the yoke 13, this measuring band having a suitably graduated scale 33 which indicates the differences between the various widths for a given length number, these width graduations being preferably designated by the letters, as shown, and the strip is also provided with a suitably graduated scale 34 corresponding to the different length numbers, the graduations of the scale 34 being preferably designated by numbers corresponding to the shoe numbers and the graduations of the scale 34 constitute the starting point from which the widths for the different shoe lengths are measured.

The device is manipulated in the following way to determine the correct length and width of a shoe to properly fit the foot. The foot is placed on the foot rest 2 with the end of the heel abutting against the heel support 27 and the ball of the foot occupying a position opposite to the slide 5. This slide 5 is then adjusted manually so that the upstanding arms 11 thereon occupy positions equidistantly from the center of the ball of the foot, these arms 11 being inclined forwardly from the vertical owing to the position occupied by the ball of the foot. The pointer 9 is then examined to determine which of the numbered graduations 10 is adjacent to it, after which the foot is removed from the foot rest and the heel guide is placed in the holes or sockets

in alinement with the line 29 which extends from the numbered line 10 adjacent to or in register with the pointer 9. This lateral heel guide and its coöperating index is employed in order to insure correct placing of the foot on the foot-rest, it being apparent that the longer the foot the greater the heel thereof must stand off from the side of the foot-rest, in order that the foot may occupy a straight position on the foot-rest when the ball of the foot is engaged by the arms 11. Hence the graduations 29 for the heel guide 32 lead from and correspond with the longitudinal graduations 10. The foot is then placed again upon the foot rest with the inner side of the heel bearing against the heel guide 32, the longitudinal center of the foot then extending parallel to the length of the foot rest. A slight readjustment of the slide 5 will then bring the arms 11 at the inner side of the foot into proper relation with the ball of the foot. The pointer 6, coöperating with the scale 8 will then indicate the correct length of the shoe, this length being the distance from the rear end of the heel to the center of the ball of the foot.

Adjustment of the slide 5 causes automatic and simultaneous adjustment of the toe slide 15 which carries the long and short arms 18 and 19, the toe slide being shifted in proper ratio to the movement of the slide 5. Therefore by determining whether the end of the great toe of the foot lies nearer the longer arm 18 or the shorter arm 19, it may be ascertained whether a shoe with a long or short forepart should be worn. Where ready-made shoes are to be supplied, these shoes may be obtained for the longest and shortest toe for the same length of arch or shank.

In order to determine the proper width of the shoe having the length determined as above described, the flexible measuring band 14 is placed around the ball of the foot, it being caused to assume a position perpendicular to the length of the foot by reason of its attachment by the yoke 13, to the slide 5. In using the measuring strip 14 for this purpose, the length number of the scale 34 corresponding to the length number indicated on the scale 8 by the ball slide 5 is selected as a starting point, and the width letter on the scale 33 which registers with the selected length number of the scale 34 indicates the proper width of the shoe. For example, if the length indicated on the scale 8 by the pointer 6 should be number 12, the width measurement will be made starting with this number 12 of the scale 34.

The device as shown in the drawing is adapted to determine the measurements of the right foot. Obviously the measuring devices shown can be duplicated on the opposite side of the foot rest, in which case the same device can be used for obtaining the desired measurements of both the right and left feet.

What is claimed is:—

1. A device for measuring the foot to determine the length of a shoe to properly fit it, comprising a foot rest, a slide movable longitudinally of the foot rest and adapted to be adjusted to the center of the ball of the foot, said slide having a pointer and the foot rest having a coöperating scale for indicating the length measure as determined by the adjustment of said slide, and a second slide also movable longitudinally of the foot rest and carrying longitudinally spaced arms which indicate the difference between the longest and shortest toe lengths, the second slide being adapted to occupy a position longitudinally of the foot rest which position is determined by the longitudinal position occupied by the slide first mentioned.

2. A device for measuring the foot to determine the length of a shoe to properly fit it, comprising a foot rest, a slide movable longitudinally thereon to bring it into a position corresponding to the center of the ball of the foot and having a pointer, the foot rest having a coöperating scale to indicate the length measure as determined by the position of said slide when adjusted, a second slide also movable longitudinally of the foot rest and carrying longitudinally spaced arms corresponding to long and short toe lengths, and motion transmitting means connecting said slides whereby the adjustment of one side correspondingly adjusts the other side.

3. A device for measuring the foot to determine the length of a shoe to properly fit it, comprising a foot rest, having a series of transverse graduations corresponding to the foot sizes to be measured and also having a series of lines leading from said transverse graduations and making an acute angle to the longitudinal dimension of the foot-rest and extending to predetermined points on the heel portion of the foot rest, a heel guide adapted to be set in alinement with one of said lines and to engage a side of the heel of the foot to determine the lateral position of the heel on the foot rest, and a slide adjustable longitudinally of the foot rest for measuring the length of the foot.

4. A device for measuring a foot to determine the size of a shoe to fit it, comprising a foot rest, a slide adjustable longitudinally thereon and having a pair of longitudinally spaced arms adapted to bear against the side of the foot at opposite sides of the center of the ball of the foot, the slide also having a pointer, a scale coöperative with said pointer to indicate the length of a foot corresponding to the position oc-

cupied by said slide, graduations spaced transversely of the foot-rest and corresponding to the subdivisions of said scale, and a heel guide adapted to be placed in different positions transversely of the foot-rest, as indicated by said graduations.

5. A device for measuring a foot to determine the size of a shoe to fit it, comprising a foot rest, a slide adjustable longitudinally thereof and adapted to be set in accordance with the position occupied by the center of the ball of the foot, and a measuring strip for determining the width of the foot, said strip being attached at one end to said slide and having thereon two scales one of which is graduated to correspond with different shoe lengths and the other of which is graduated to correspond with different shoe widths as measured from the different graduations of the first-mentioned scale.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM M. HALBACH.

Witnesses:

FRANC TORS,

FR. ELMER.