June 5, 1934. H. E. CLARKE 1,962,101

SHOE FITTING MACHINE

Filed Dec. 30, 1931

Fig. 1.

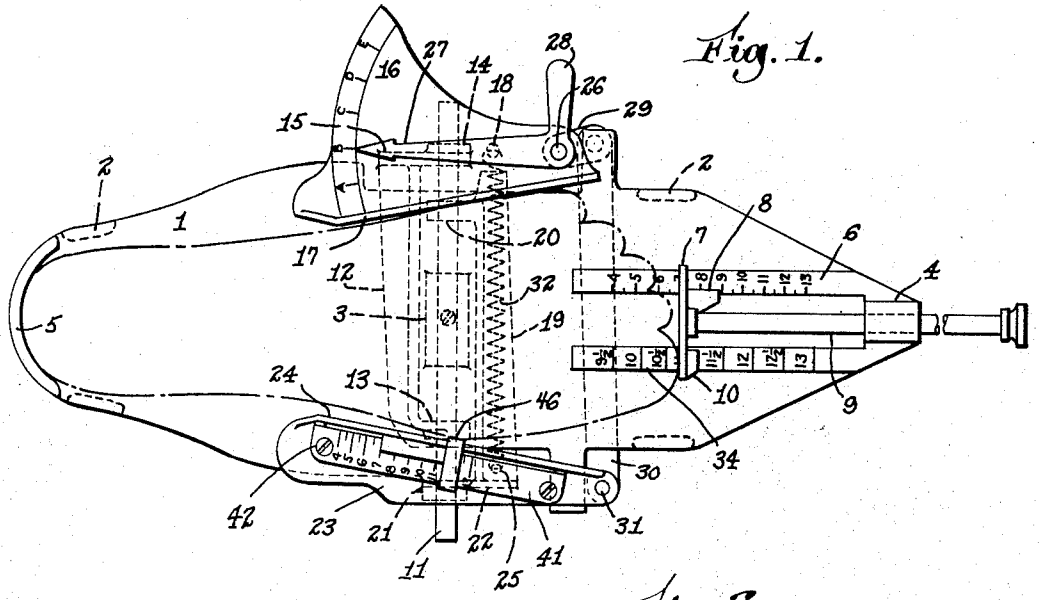


Fig. 2.

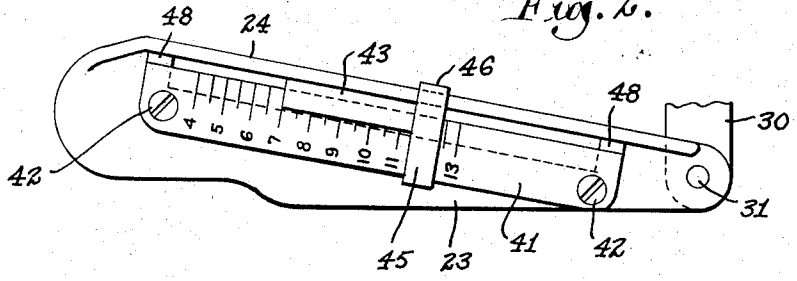


Fig. 3.

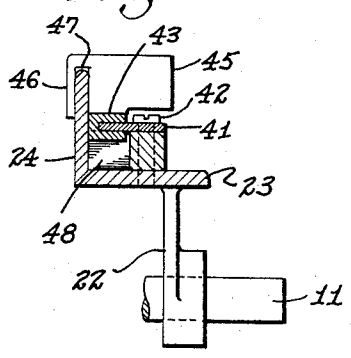
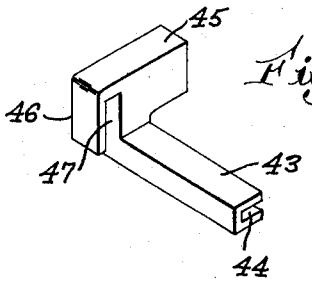


Fig. 4.



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SHOE FITTING MACHINE

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5 Claims. (Cl. 33—3)

This invention relates to an apparatus used for fitting shoes in shoe stores where the problem for the salesman is to select a properly dimensioned shoe to fit the feet of a customer. The invention is in the nature of an improvement in the type of shoe fitting machines disclosed in United States Letters Patent of E. J. Bliss No. 1,426,143 dated August 15, 1922 and is intended to provide therefor a means for more readily and accurately aiding the shoe salesman in his task of selecting from the great variety of different sizes of shoes in stock the particular size of shoe most appropriate to fit the customer who is being measured.

One of the underlying merits of the aforesaid patented machine consists in the fact that it will instantly give the length and the width measurements of the foot directly in terms of length and width sizes used for designating or indicating differently dimensioned shoes in stock, thus avoiding any mental computations or reference to measurement conversion tables by the salesman which is likely to be a prolific source of error. Such machines, however, were laid out and made to give the width-size and the length-size readings for an approximately normal foot, which, it is commonly assumed, has a ball length equal to two-thirds of the over all length. This assumption, while valid for a large majority of cases, does not apply to a foot that is abnormally long or abnormally short in the forepart.

In shoe fitting length-size designations are indicated by successive numerals, each full length-size increment being equal to one-third inch. In normally proportioned feet, since the ball length, that is, the longitudinal distance from the back of the heel to the transverse line of the ball joint of the great toe, is two-thirds of the total length of the foot, it is clear that with each length-size increment of one-third inch in the over all length measurement of the foot the ball length increases in a two-thirds ratio, or by units of two-ninths of an inch.

Now suppose that the forepart, that is, the part from the ball joint to the tip of the great toe, is abnormally long in proportion to the remainder of the foot so that the foot might have the ball length and the width measurement of a normal 7C foot, yet the over all length, due to two extra size lengths (two-thirds inch) in the length of the abnormal forepart, might be indicated and would read as a No. 9 measurement.

Now, in the aforesaid Bliss machine, as the width indication is dependent upon the ball length and as the length-size reading would show a No. 9 foot, the salesman would expect to select a shoe for a No. 9C foot; but as a C width in a No. 9 is equal to an E width in a No. 7 shoe, the shoe selected obviously would not fit, as it would be two width-sizes too large. Moreover, as the ball joint point of a No. 9 shoe would be well in advance of the proper location for the ball of a No. 7 foot, the shoe would not be properly proportioned for comfort yet the reading would indicate a No. 9C measurement. A corresponding error would occur in the machine where the width-size indication is correlated with the over all length when an abnormally proportioned foot is being measured.

Now what the customer, in the supposed case, would require would be a shoe to fit a foot having a No. 7 ball length-size and a C width of that size and also having a forepart extension of two extra length-sizes beyond the two length-size extensions ordinarily allowed by the last maker. It should of course be understood that in ordinary practice the last on which a shoe is made should be somewhat longer in the forepart than the foot for which it is intended in order that the toe of the wearer should have proper clearance and not press against the toe end of the shoe. The clearance space thus provided in shoe making is termed the "extension" and the toe extension provided in different shoes may vary from one and one-half length-sizes to as much as four or five length-sizes, but ordinarily one and one-half or two length-size extensions are deemed sufficient clearance for a normal foot.

By providing means for giving an accurate length-size measurement of both the over all length and the ball length, any departure from the normal forepart proportions is instantly disclosed by the readings on the machine, so that a correspondingly proportioned shoe of proper size may be indicated for selection.

In the accompanying drawing I have illustrated a construction and arrangement embodying the principles of this invention, in which

Fig. 1 is a plan view of the complete machine.

Fig. 2 is an enlarged detail view of one of the width gauging members provided with a ball length scale and pointer attached.

Fig. 3 is a vertical cross section through said width gauge scale and pointer as viewed from the rear end of the machine.

Fig. 4 is a detail showing in perspective the construction of the ball-length indicating pointer.

The machine incorporating the present improvement is similar in construction to that disclosed in the aforesaid Bliss patent and it will be briefly described for the purpose of illustrating the application to, and the use therewith of, the present ball-length measuring means.

The fixed frame of the machine comprises a base or platform 1 raised by supporting feet 2 to provide room for the underneath mechanism and having at its forward end a guide bearing 4 for the reception of a toe gauge rod 9, to whose rear end is attached an upstanding or vertical toe gauge plate 7 having the length-size indicating

pointer 8 and a stocking pointer 10 travelling over the over all length scale 6 and the stocking size scale 34. A heel stop 5 at the rear end serves to properly position the heel when the foot is placed on the machine in normal standing position to support the weight of the customer.

Two independently movable side gauges comprising vertical plates 17 and 24 have, respectively, horizontal outwardly projecting extensions 16 and 23. The foot gauging or calipering vertical members 17, 24 are disposed in opposition to each other and, as in the above described patent, are provided with underneath bearing arms 12 and 19 having offset bearing lugs 13 and 20, which are slidably supported on a fixed track or horizontal supporting rod 11 so that the width calipering gauge members may have independent movement toward, and away from, each other to gauge against the opposite sides of the ball of the foot against which they are drawn by a connecting contractile spring 32. The width calipering gauge members 17 and 24 are provided, respectively, with horizontal outwardly projecting shelves or flanges 16 and 23. On flange 16 is provided an arcuate width-size scale 15, along which travels a pivotal pointer 17 fixed to a vertical arbor 26, which is provided with an underneath offset arm 29 to which is pivotally connected the adjacent end of a link 30 which is pivotally connected at 31 with the opposite gauge member so as to rock the pointer 27 outwardly in proportion to each increase in the distance separating the two width gauges from each other. The above described construction is substantially the same as that described in the aforesaid Bliss patent.

The opposite ball portions of the interposed foot with the heel in contact with the rear heel stop 5 determines not only the positioning of the two width gauges, but also the amount of their separation according to the distance of the ball line from the heel stop on the principle that the greater the distance of the ball line from the heel stop, the narrower will be the indicated width-size measurement of the same absolute width of foot. Whatever individual position the respective gauge members may assume in forming gauging contact with the foot itself, the distance separating them on the ball line determines the position of the pointer by reason of the connecting link 30 and its connections with the pointer 27.

Now, it will be seen that the ball-length, or the distance from the back of the heel to the ball joint of the great toe, as well as the width of the foot at that point, determines the width measurement of the foot in terms of width-sizes but the toe gauge 7 registers the over all length without reference to the ball-length in cases where, as previously explained, the over all length is disproportionate to the ball-length by reason of the fact that the forepart length from the ball joint to the tip of the toe is substantially greater, or substantially less, than the normal proportion of one-third of the over all length. In other words, the width measurement is founded upon the ball length of the foot, while the over all length is determined independently of the ball measurement so that in an abnormally proportioned foot there is nothing to indicate such departure from the normal to the salesman making the measurement.

To remedy this deficiency I have provided on one of the width gauging members a ball-length measuring device which translates the ball-length into terms of foot length, so that the salesman will be instantly apprised of any discrepancy between the length-size of the foot, as indicated by the ball gauge, and the length-size of the foot as indicated by the over all toe gauge.

On one of the width gauges I secure a ball-length scale in the form of a scale plate 41 supported on a bar secured to the horizontal swing or shelf member 23 of the gauge by attaching screws 42 passing through registering holes in the scale plate and the bar and tapped into the supporting flange 23 of the gauge member. Mounted to slide longitudinally of the gauge member and of the scale plate is a pointer 43 grooved to fit over the inner edge of the scale plate 41, as shown at 44, and having an upstanding member 45 provided with an underneath vertical notch or slot 47 to fit over the top of the vertical side of the gauge 24. The rear end of this pointer or indicator 43 registers with different scale marks on the ball-length scale as it is moved either forward or back, in order to bring the ball contacting member 46 in contact with the center or high spot of the ball joint of the great toe.

From the previous explanation it will be understood that the size indicating spaces on the ball-length scale 41 should measure approximately two-thirds of the size-length spaces on the over all scale 6.

In practice the person to be measured stands on the platform with his heel against the heel stop 5 and his foot extending toward the forward end of the machine when the pointer is released by the salesman swinging the handle 28 in a counter-clockwise direction to a position approximately shown in Fig. 1, which allows the contractile spring 32 to have free action in drawing the gauge members toward each other against the opposite sides of the ball portion of the foot. The pointer 43 is then slid along the ball-length scale until its inwardly projecting ball-engaging arm 46 comes opposite the high point of the ball joint. According to the illustration in the drawing, the reading on the ball-length scale 41 and on the width-size scale 15 indicates a foot having a No. 7B size. In this particular case the reading of the toe gauge indicates a foot length-size No. 7 and a shoe length-size No. 9, that is, a shoe provided with two length extensions to fit a No. 7 foot. Since in this case the ball-length indicator and the over all length indicator show the same size of foot, the salesman is informed that he is dealing with a No. 7 foot but should the toe gauge indicate a No. 8 or a No. 9 foot he will understand at once that the measurements indicate a No. 7C shoe with one or two extra length extensions in the toe, whereas without the ball-length measurement herein provided for there is nothing to inform him that he is not dealing with a normal No. 8C or No. 9C foot, since that would be the plain reading on the machine without the ball-length indicator.

It will therefore be seen that when dealing with a foot that departs substantially from the normally assumed proportions, the salesman is informed of that fact by the machine itself and is also informed as to how much additional toe extension is required. Moreover, this arrangement insures one thing which is of very great importance in fitting shoes, namely, the correct ball-length of shoe to fit the exactly disclosed ball-length and width of the foot being measured and this also avoids waste of time in trying on different sizes of shoes when fitting a foot that is not normally proportioned.

In the particular machine illustrated the side gauges diverge in a forward direction on angles

that will correspond to an increase of one width-size unit or each increment in length, equal to two-thirds of the regular length-size unit for the purpose described in the aforesaid Letters Patent, because in this case, as above stated, the width-size indication or reading is based on the ball-length of the foot being measured.

What I claim is:

1. In a shoe fitting machine the combination with two independently movable width gauge members arranged to caliper the ball portion of the foot, one of said members being provided with a width-size scale and adjacent movable indicator whose size indicating position is dependent on the distance separating the contact points of the foot against the gauges, and a ball-length measuring scale on one of said gauges, and a ball-length indicator movable along said ball-length scale to indicate the ball-length size of the foot.

2. In a shoe fitting machine the combination with independently movable opposed width calipering gauge members provided with a width-size scale and a width-size pointer movable into registry with the different size indicia on said scale according to the ball width gauging relation of said gauge members, one of said gauge members being provided with a ball-length size scale, and a ball engaging indicator movable longitudinally thereon to register the size-length of the foot according to the location of the ball.

3. In a shoe fitting machine the combination with a heel stop, transversely movable opposed divergent width calipering gauges for calipering the ball portion of the foot, a ball-length size scale on one of said gauge members, a width-size scale carried by one of said members, and separate indicating pointers movable along the respective scales to register thereon the ball-length size and the width-size of the foot according to the location of the ball to the heel stop and the width of the foot.

4. In a shoe fitting machine the combination of a foot supporting base provided with a heel positioning stop, a longitudinally movable toe gauge movable along a length-size scale to indicate over all length-size of an interposed foot, ball width gauging members independently movable in a transverse direction toward and away from each other into gauging contact with the ball portion of the foot, a width-size pointer movable into registry with the indicia of a width-size scale according to the separation of the contact points of the gauge members by the interposed foot, and a ball-length pointer movable along a longitudinal ball-length size scale to ball engaging position and indicating, in correlation with the width-size measurement, the appropriate ball-length measurement.

5. In a shoe fitting machine the combination with a heel positioning stop, a pair of opposed transversely and independently movable ball calipering gauge members, a width-size scale and pointer for indicating the width-size of an interposed foot in correlation with the ball-length of an interposed foot gauged against the heel stop, a ball-length scale and pointer carried by one of said gauge members to indicate the ball-length size of the foot, and a longitudinally movable toe gauge movable along an over all length size scale affording, in conjunction with the ball-length indicator, a means for ascertaining normalcy or departure therefrom in the length of the forepart of the foot.

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