Jan. 1, 1946. J. FITZPATRICK 2,391,889

FOOT MEASURING APPARATUS

Filed Dec. 31, 1943 2 Sheets-Sheet 1

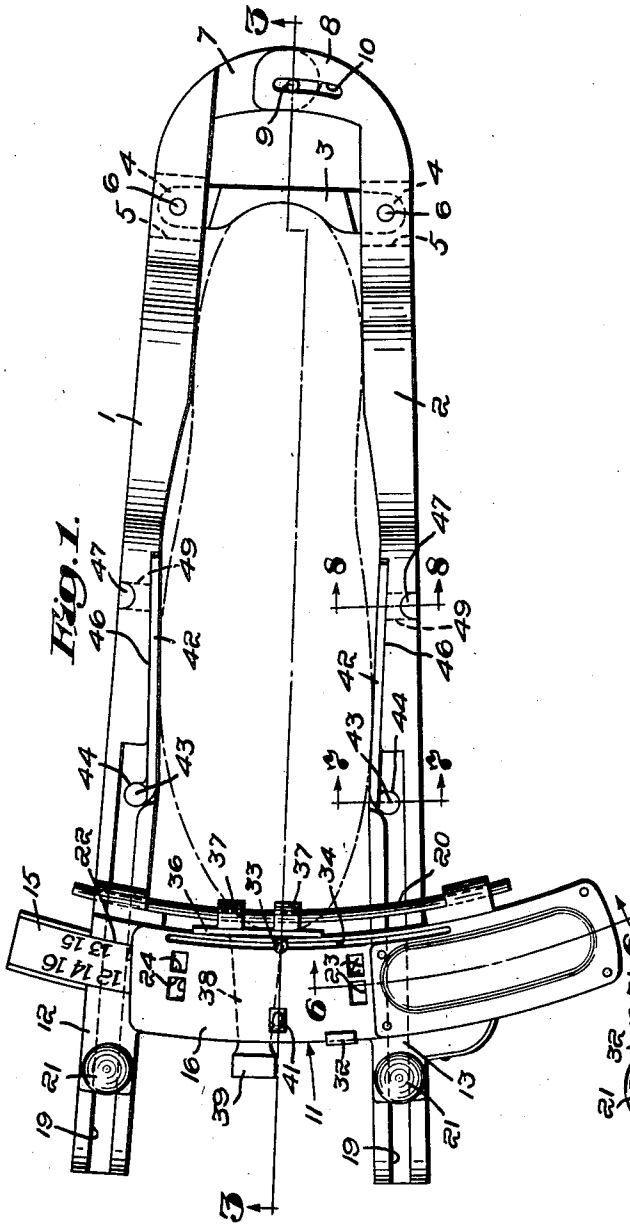


Fig. 1.

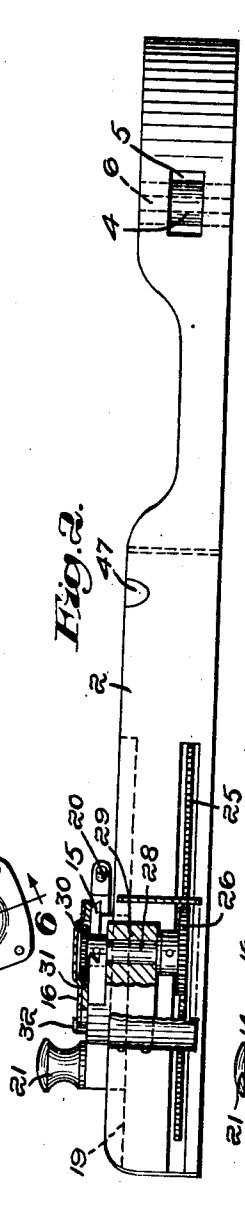


Fig. 2.

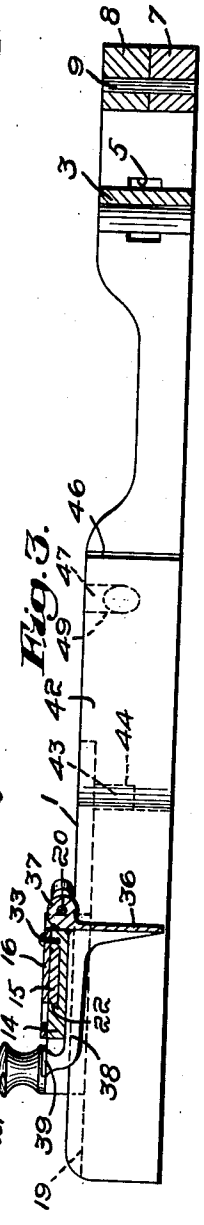


Fig. 3.

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Fig. 4.

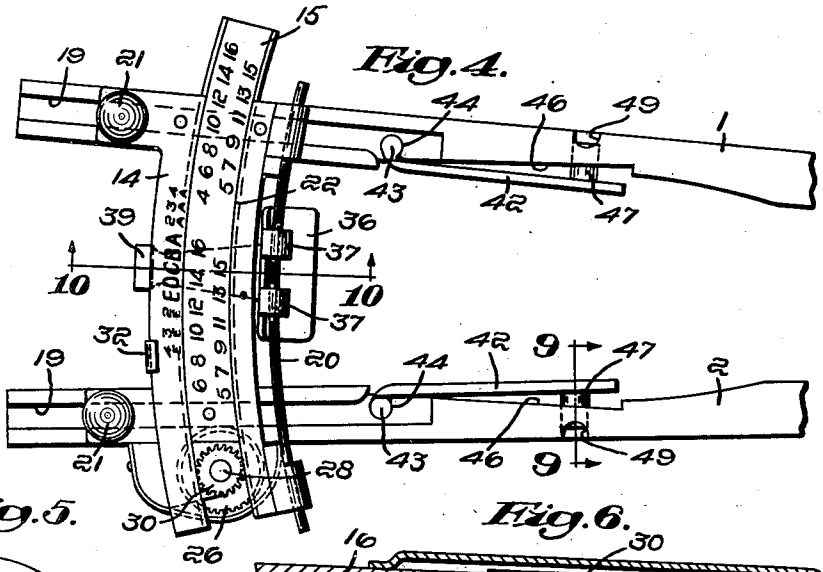


Fig. 5.

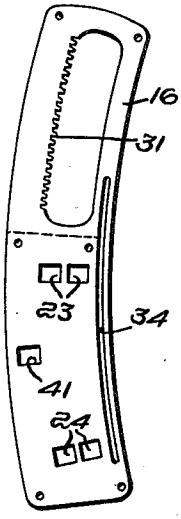


Fig. 6.

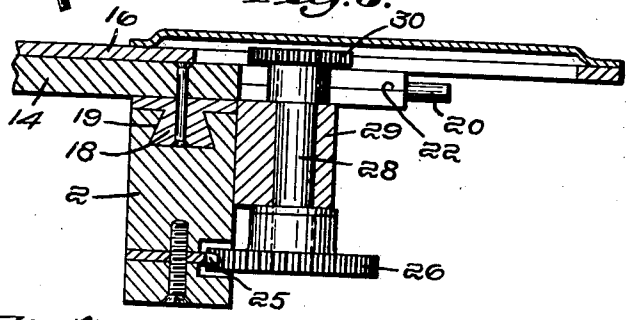


Fig. 7.

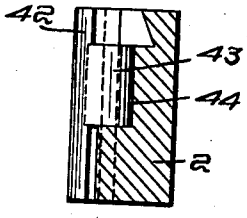


Fig. 8.

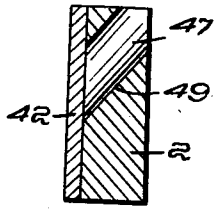


Fig. 9.

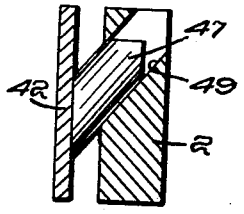
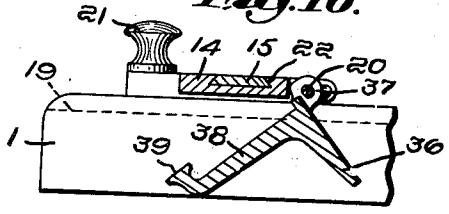


Fig. 10.



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UNITED STATES PATENT OFFICE

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FOOT MEASURING APPARATUS

Jeremiah Fitzpatrick, Weymouth, Mass.

Application December 31, 1943, Serial No. 516,379

9 Claims. (Cl. 33—3)

The invention relates to a foot measuring apparatus and the object of the invention is to provide a foot measuring apparatus of simple construction, accurate in its measurement, and easily operable.

The invention can best be seen and understood by reference to the drawings in which—

Fig. 1 is a plan of the apparatus.

Fig. 2 is a side elevation with part broken away and shown in section.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a plan of a portion of the apparatus.

Fig. 5 is a plan of the under side of one of the measuring elements later to be referred to.

Fig. 6 is a section on the line 6—6 of Fig. 1.

Fig. 7 is a section on the line 7—7 of Fig. 1.

Fig. 8 is a section on the line 8—8 of Fig. 1.

Fig. 9 is a section on the line 9—9 of Fig. 4; and

Fig. 10 is a section on the line 10—10 of Fig. 4.

The frame of the apparatus comprises a set of spaced bars 1 and 2 resting upon any suitable base of support upon which the foot to be measured may be placed interposed between the bars. The bars are of substantially equal length, and longer than the length of the longest foot to be measured by the apparatus, the bars extending fore and aft of the foot inserted between them for measurement.

Interposed between the bars inwardly removed from their rear ends is a heel stop 3 against which the heel of the foot to be measured is initially placed. The bars are each pivoted to this heel stop by pivotal or hinge forming joints. These joints preferably consist of tongues 4 on the ends of the heel stop which fit within sockets 5 in the respective bars and turn on pins 6 passed through the bars and tongues. Thus the bars in the parts thereof lying forward of the heel stop may be turned laterally with relation to each other which figures in the measurement of the width of the foot as will later be explained.

Both bars preferably extend beyond and to the rear of the heel stop. The ends of the bars are brought together and connected in manner to permit of the lateral turning of the bars on the heel stop and, at the same time, maintain the lengthwise extension of the bars with respect to each other irrespective of their laterally turned positions. The ends of the bars are accordingly provided with inwardly extending extensions; the bar 1 with an extension 7 and the bar 2 with an extension 8. These extensions are arranged in different planes to permit of the extensions lapping by one another, and the end of the extension 7 to the bar 1 is provided with a pin 9 which fits and slides within an elongated curved socket 10 formed within the extension 8 to the bar 2 as the bars are turned laterally with relation to each other. The length of the slot 10 prevents any undue lateral turning of the bars, but such as will in any event be sufficient to obtain the width measurement of any size foot.

Mounted upon the top of each of the bars and slidable lengthwise thereon is a slide 11. This slide has various parts including shoes 12, 13 and measuring elements 14, 15 and 16. The shoes are mounted to slide on the respective bars, 12 representing the shoe mounted to slide upon the bar 1, and 13 representing the shoe mounted to slide upon the bar 2. Sliding connection is obtained between the shoes and the respective bars by providing each shoe on the under side thereof with an elongated tenon 18 which slides within a slot 19 cut longitudinally in the top of the bar. The two shoes are connected to move in unison partly by the elements 14, 15 mounted, respectively, upon them, and partly by a wire 20 fixed to the rear ends of the shoes facing the heel stop. The sliding of the shoes is effected manually, preferably through knobs 21 on the fore ends of the shoes. The extent of the shoes' slidability upon the bars is ample to effect the measurement of all foot sizes as to length.

The elements 14 and 15 are in the nature of narrow plates, of which the one 14 is fixed to the shoe 12 with lateral extension over the shoe 13 but not secured to this shoe, while the element 15 is secured to the shoe 13 with lateral extension over the shoe 12 but not secured to this shoe. The two elements are parallelly aligned with each other, with the tops of the elements preferably lying within the same plane. The elements are also curved elements, each being a segment of a circle whose center lies within the longitudinal center of the apparatus at a point rearward of the heel stop, thus enabling the elements to turn laterally with relation to each other as the frame bars, or one of them is laterally turned. In the preferred construction the element 14 is made relatively wide with a slot 22 in it into which fits the element 15 with slidability therein.

During the measurement of the foot for length the elements 14 and 15 remain passive with no lateral displaceability by one another and move together as a unit as the slide 11 is moved longitudinally along the respective frame bars, any slight angularity between the frame bars, which might cause some relative movement of the ele-

ments to each other, being practically negligible owing to the fact that the frame bars are substantially parallel to each other at all times. A length full size scale is provided on the element 15, the sizes running from 4 to 16, inclusive, in staggered relation to each other to avoid overcrowding, and extending in a lengthwise direction along the element. There is also provided on the element 15 a length half-size scale in half sizes corresponding with the full sizes and appearing on the element in imprint of a different color than the imprint of the full sizes.

Arranged to cooperate with the respective elements 14 and 15, and especially with the element 15, bearing the length size scales is the element 16. This element, in the nature of a plate, has openings 23, 23; 24, 24 in it, through which some one of the length sizes, either full sizes or half sizes, will appear as the plate is moved in a lengthwise lateral direction over the top of the element 15. The element 16 has a precise and determinate movement for all shoe sizes, either full sizes or half sizes, and the size having been determined and its visibility through one or the other of the openings 23, 24 in the element 16 through which the indication appears, thereupon the element 16 remains passive with respect to the element 15, the indication of size as to length then continuing to be seen, although the elements 14 and 15 may be moved laterally in relato to each other for determining the measurement of the width of the foot as will later be explained.

The element 16 is moved by the movement of the slide 11 over the frame bars and its direction of movement depends upon the direction of movement of the slide. The element 16 is moved to the right as viewed by the operator of the apparatus as the slide is moved inwardly, and to the left as the slide is moved outwardly.

Movement is thus imparted to the element 16 by a rack 25 on the side of the frame bar 2. Engaging this rack is a pinion 26 borne by a shaft 28 which turns within a bearing 29 on the side of the shoe 13. On the top end of this shaft is a pinion 30 engaging a rack 31 on the inner side of the element 16. The relation of the parts is such that the element 16 will be moved by the slide to have a precise and determinate movement dependent upon the length of the foot, and the length of the foot having been determined initially by the longitudinal movement of the slide then the element 16 will remain passive with respect to the element 15 on which the length size indication will appear through one or the other of its openings 23 as previously explained. In order that the rack 31 on the element 16 may be maintained in proper co-ordination with its engaging pinion 30 the element is slidably secured to the element 14 by a clip 32 on one side and by a pin 33 on the other side, which passes along a slot 34 in the element 16 as this element is moved.

In the determination of the size of the foot as to length the slide will be moved into a rest position corresponding with the precise length of the foot which is indicated, and this indication is provided for as follows: Pivotally hung upon the wire 20 borne by the slide so as to engage the toe of the foot being measured as the slide is moved in the direction of the foot is a plate 36. This plate is hung upon the wire by arms 37 through which the wire passes so that the plate may turn pivotally upon the wire or be moved laterally along the wire in position to precisely engage the toe of the foot. Extending from the fore side of this plate adjacent the top plate is an arm 38 having an upturned end 39. This arm tends to overbalance the plate and normally maintain it in a position inclined towards the toe of the inserted foot. When the slide has been moved inwardly so far that the toe of the inserted foot will have moved the plate to a vertical position this position is indicative of the exact length of the foot, and thereupon the arm will be turned upwardly against the under sides of the elements 14 and 15 of the slide, and the upturned end 39 of the arm will appear at the front of the slide, its top surface lying substantially flush with that of the element 14. Thus the precise length of the foot is indicated, after which the slide remains passive and the indication of the length size of the foot will appear through one or the other of the openings 23, 23, or 24, 24, in the element 16.

The foot having been measured for length its precise width is indicated on a width size scale on the element 14, the notations on this scale properly corresponding with the notations of length size and one of these notations will appear through an opening 41 in the element 16 when the frame bars 1 and 2 have been moved relatively towards one another in amount sufficient to engage the sides of the foot. In this connection it will be noted that in the operation of the apparatus the element 16, which surmounts the elements 14 and 15, is movable over the element 15 for obtaining an indication of length, such indication appearing through an opening, or openings, in the element 16, on the length scale, or scales, on the element 15. The measurement for length and indication thereof having been obtained the element 16 remains passive with relation to the element 15 during the obtaining of the width measurement. For obtaining the width measurement the elements 14 and 15 are moved laterally in or out with relation to each other, dependent upon the width of the foot to be measured. During this movement the position of the element 16 with relation to the element 15 will not be disturbed. Accordingly, in the measurement for width the indication thereof will depend upon the length measurement, for it will appear upon the width scale on the element 14 through an opening in the element 16 then passive with relation to the element 15 upon which the measurement for length is being indicated, as previously explained.

In order that the engagement of the frame bars 1 and 2 with the sides of the foot may be a precise and delicate engagement the frame bars are provided on their inner sides with bearing plates 42. These plates are of some considerable length so as to engage the sides of any size of foot. The bearing plates are pivoted to the frame bars each by a tenon 43 on the end of the plate which fits and turns within a socket 44 formed in the bar. When the foot is measured these bars will be turned inwardly with relation to the frame bars substantially as shown in Fig. 4, and when the frame bars have been moved inwardly with relation to each other in amount sufficient to properly measure the width of the foot the bearing plates 42 will have entered a position inset within elongated sockets 46 formed in the respective bars. In order that it may be indicated when the width measurement is complete and the frame bars socketed as aforesaid, indicators 47 are provided. These indicators consist of loosely fitting plugs which slide within sockets 49 in the frame bars. The angularity of these sockets and the form and arrangement of the plug indicators is such that when the bearing

plates are in an out-turned position substantially as shown in Fig. 4 the plug indicators will occupy an out of the way position substantially as shown in Fig. 9. When, however, the bearing plates have entered their sockets by the relative inward movement of the frame bars toward each other then the indicator plugs will appear as shown in Fig. 8, indicating the completion of the width measurement of the foot. Thus any undue bearing of the frame bars against the side of the foot which would give a wrong width measurement is avoided, the width bearing being a very precise and delicate bearing.

I claim:

1. In a foot measuring apparatus the combination comprising a set of spaced frame bars arranged to flank the foot to be measured on either side thereof, a heel stop interposed between the bars, means connecting the bars whereby those portions thereof forward of the heel stop may turn laterally towards one another into a determinate laterally turned position, a slide mounted upon said bars and movable longitudinally thereon in reverse directions, said slide including shoes and elements borne by the shoes, said elements being secured, respectively, to the respective shoes and lapping by one another whereby they may be moved laterally with relation to each other as the lateral position of the frame bars is changed, said slide including also an element mounted to be movable laterally over one of said first named elements, means whereby the length size of the foot may be measured and indication thereof obtained by the lateral displacement of said last named element to a determinate position of rest commensurate with the length size of the foot, means whereby the movement and positioning of said last named element may be obtained through movement of the slide to a determinate position of rest commensurate with the length size of the foot, and means whereby the width size of the foot may be measured and indication thereof obtained upon the lateral displacement of said frame bars towards one another to a determinate position of rest commensurate with the width size of the foot when said last named element is occupying its determinate position of rest as aforesaid.

2. In a foot measuring apparatus the combination comprising a set of spaced frame bars arranged to flank the foot to be measured on either side thereof, a heel stop interposed between the bars, means connecting the bars whereby those portions thereof forward of the heel stop may turn laterally towards one another into a determinate laterally turned position, a slide mounted upon said bars and movable longitudinally thereon in reverse directions, said slide including shoes and elements borne by the shoes, said elements being secured, respectively, to the respective shoes and lapping by one another whereby they may be moved laterally with relation to each other as the lateral position of said frame bars is changed, said slide including also an element mounted to be movable laterally over one of said first named elements, means whereby said last-named element may be moved dependent upon the movement of the slide laterally over said one of said first-named elements to a determinate position of rest commensurate with the length size of the foot measured, means whereby the size number of the foot may be indicated when said last-named element is occupying its determinate position of rest, and means whereby the width size of the foot may be measured and indication thereof obtained upon the lateral displacement of said frame bars towards one another and against the sides of the foot when said last-named element is occupying its determinate position of rest as aforesaid.

3. In a foot measuring apparatus the combination comprising a set of spaced frame bars flanking the foot to be measured on either side thereof, a heel stop interposed between said bars, a slide mounted upon said bars and movable longitudinally thereon in reverse directions into a determinate position dependent upon the length of the foot to be measured, a member loosely hung on the rear end of said slide occupying normally a position inclined towards the toe of the foot to be measured and displaceable by the toe as the slide is moved in the direction of the toe into a determinate position which corresponds with the precise length of the foot to be measured, and means borne by said member for indicating such determinate position.

4. In a foot measuring apparatus the combination comprising a set of spaced frame bars flanking the foot to be measured on either side thereof, a heel stop interposed between said bars, means connecting the bars whereby those portions of the bars forward of the heel stop may turn laterally towards one another into a determinate lateral position corresponding with the width of the foot, bearing plates loosely connected to the frame bars and normally occupying positions out-turned therefrom and engageable with the sides of the foot and with respect to which plates said bars occupy a changed position when said bars have been moved laterally into a position corresponding with the precise width of the foot, and means for indicating such changed position.

5. In a foot measuring apparatus the combination comprising a set of spaced frame bars arranged to flank the foot to be measured on either side thereof, a heel stop interposed between the bars, means connecting the bars whereby those portions thereof forward of the heel stop may turn laterally towards one another into a determinate laterally turned position of rest dependent upon the width of the foot, a slide mounted upon said bars and movable longitudinally thereon in reverse directions, said slide bearing elements arranged whereby they may be moved in a lateral direction relatively to each other as the lateral position of said frame bars is changed, one of said elements bearing a scale for indicating length and the other of said elements a scale for indicating width, said slide bearing also an element mounted to be movable laterally over the one of said first named elements bearing the scale indicating length, means whereby said last named element may be moved and thereby be made to indicate the length of the foot on the scale indicating length through movement of the slide to a determinate position of rest as determined by the length of the foot, and means whereby the width of the foot may be indicated on the scale for indicating width by said last named element upon the lateral displacement of said frame bars towards one another to a determinate position of rest corresponding with the width of the foot when said last named element is occupying its determinate position of rest for indicating length as aforesaid.

6. In a foot measuring apparatus the combination comprising a set of spaced frame bars arranged to flank the foot to be measured on either side thereof, a heel stop interposed between the bars, means connecting the bars whereby those portions thereof forward of the heel stop may turn

laterally towards one another into a determinate laterally turned position of rest dependent upon the width of the foot, a slide mounted upon said bars and movable longitudinally thereon in reverse directions, said slide bearing elements arranged whereby they may be moved in a lateral direction relatively to each other as the lateral position of said frame bars is changed, one of said elements bearing a scale for indicating length and the other of said elements a scale for indicating width, said slide bearing also an element mounted to be movable laterally over the one of said first named elements bearing the scale indicating length, means whereby the length size of the foot may be indicated on the scale indicating length by said last named element upon the lateral displacement of said last named element to a determinate position of rest commensurate with the movement of the slide to a determinate position of rest as determined by the length of the foot, means whereby through operation of the slide the determinate positions of rest to which said last named element is moved corresponding with the length of the foot to be measured may be obtained, and means whereby the width of the foot may be indicated on the scale indicating width by said last named element upon the lateral displacement of said frame bars to a determinate position of rest corresponding with the width of the foot to be measured when said last named element is occupying its determinate position of rest for indicating length as aforesaid.

7. In a foot measuring apparatus the combination as claimed in claim 1, including means for obtaining and visually indicating the position of rest to be occupied by the slide when measuring the length size of the foot, and means for obtaining and visually indicating the determinate position of rest occupied by the frame bars when measuring the width size of the foot.

8. In a foot measuring apparatus the combination as claimed in claim 1, including a member loosely hung on the rear end of the slide occupying normally a position inclined towards the toe of the foot to be measured and displaceable by the toe as the slide is moved in the direction of the toe into a determinate position which corresponds with the precise length of the foot to be measured, and means borne by said member for indicating such determinate position.

9. In a foot measuring apparatus the combination as claimed in claim 1, including bearing plates loosely connected to the frame bars and normally occupying positions out-turned therefrom and engageable with the sides of the foot and with respect to which plates said bars occupy a changed position when said bars have been moved laterally into a position corresponding with the precise width of the foot, and means for indicating such changed position.

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