

Nov. 17, 1925.

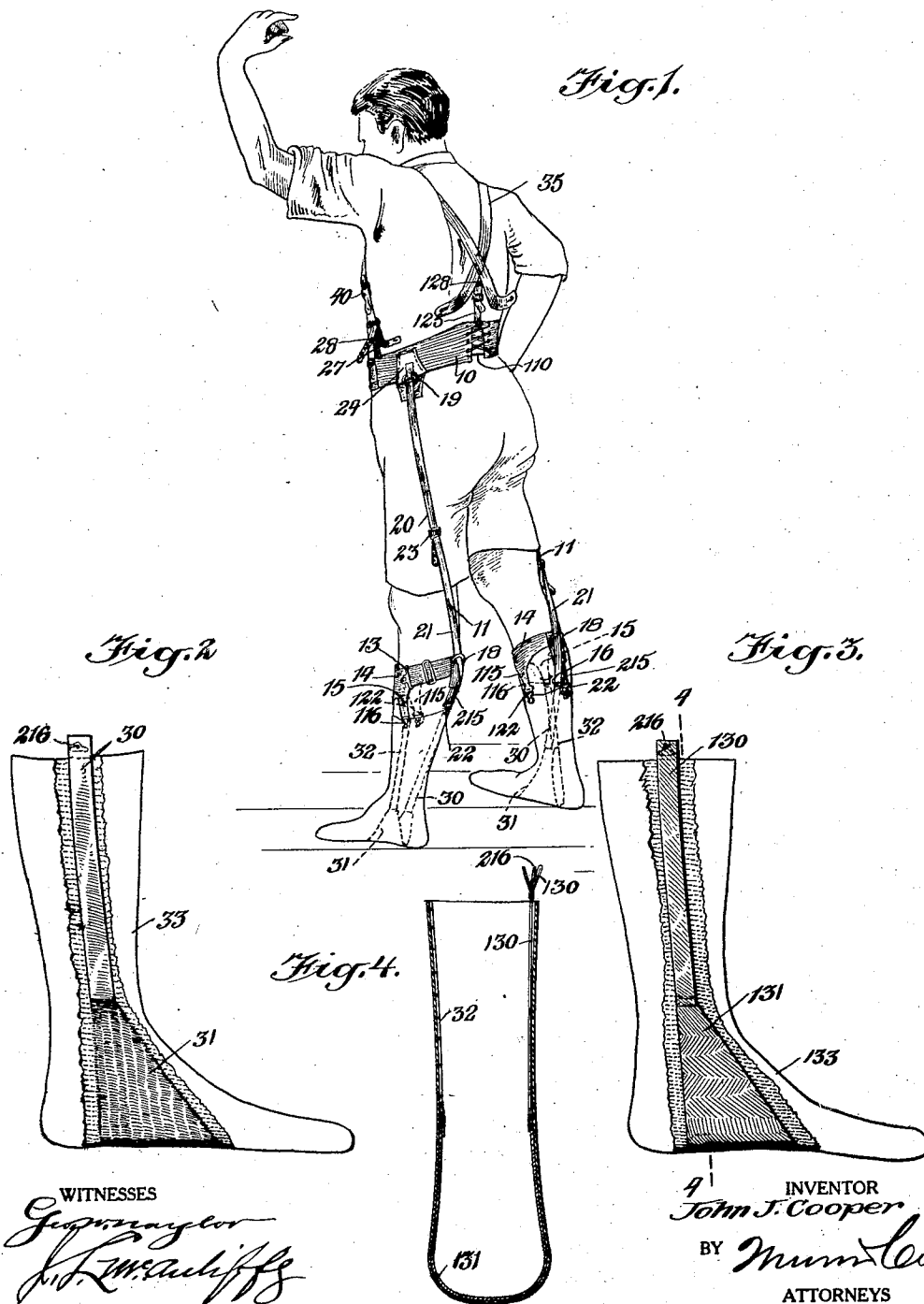
1,562,294

J. J. COOPER

LEG AND FOOT DEVELOPER

Filed April 23, 1925

2 Sheets-Sheet 1



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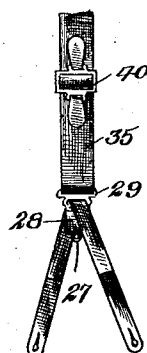
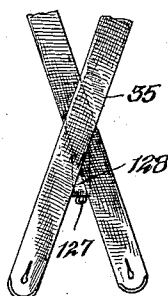
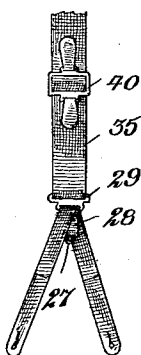
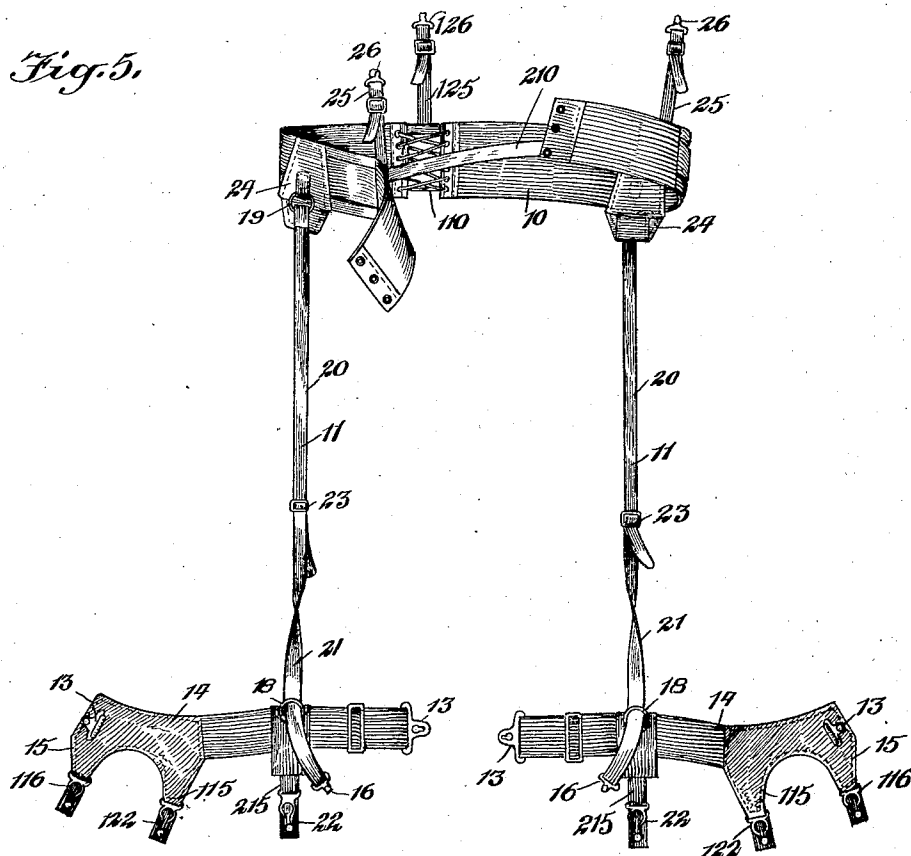


Fig. 5.



WITNESSES

Guernsey
J. L. M. Ruff

INVENTOR

John J. Cooper
BY *Murphy & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN J. COOPER, OF NEW YORK, N. Y.

LEG AND FOOT DEVELOPER.

Application filed April 23, 1925. Serial No. 25,372.

To all whom it may concern:

Be it known that I, JOHN J. COOPER, a citizen of the United States of America, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Leg and Foot Developer, of which the following is a description.

My invention relates to a surgical appliance that will be effective in restoring lost functions to certain important muscles of the hips, legs and feet.

The present invention is more particularly intended as an improvement on the leg and foot developer forming the subject matter of United States Patent Number 1,548,711.

In common with my aforementioned filed application the present invention has for its prime object to provide an appliance embodying elements constituting in effect artificial ligaments which will so function as to subject the muscles and tendons of the hips, legs and feet to a resistance in walking to bring about a control of defective muscles and restore them to normal functions as well as to produce blood circulation in the affected regions.

An important object also of the invention of my application aforementioned and my present application is to provide an appliance that will make heel and toe walking and more or less of a toeing in in walking natural and normal and in fact be compelling toward a practice of the corrective walking referred to.

More specifically, the present invention has for an object to provide novel and effective means for insuring the directional control of the ligaments in exerting a force on the feet and legs as well as to provide novel parts associated with members appurtenant to stockings and functioning in a manner to prevent discomfort and to minimize the stresses exerted on the feet and legs beyond that required for producing the beneficial results. Other objects will appear from the description hereinafter given.

Reference is to be had to the accompanying drawings forming a part of this specification, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a perspective view of a leg and foot developer embodying my present

invention showing the same applied and in use;

Figure 2 is a side elevation of a stocking forming part of my present novel assemblage a portion of the stocking being broken away to show interior parts, the foot sling in the form shown in Figure 2 being integral with the stocking;

Figure 3 is a view similar to Figure 2 but showing an adventitious foot sling applied to the stocking as distinguished from one needed or otherwise produced integral with the stocking;

Figure 4 is a transverse vertical section of the stocking in a plane indicated by the line 4-4 in Figure 3;

Figure 5 is an elevation of the leg and foot developer formed in accordance with the present invention, portions of the suspenders forming part of the assemblage being broken away.

In carrying out my invention in accordance with the illustrated example, a broad belt 10 is provided adapted to be worn about the waist and having lacing 110 as well as a front narrow strip 210 forming a permanent connection between the ends of the belt to measurably hold the belt in position before being adjusted. Pendent from the belt 10 are elongated elements designated generally by the numeral 11, said elements constituting ligaments as will appear. Leg bands 14 are provided adapted to encircle the leg at the calf or adjacent the knee and said leg bands have depending tabs 15, 115 and 215. The ligaments 11 have guided movement on rings 18 on the leg bands 14. The lower end of each ligament is provided with a clasp 16. On tab 115 of the leg band 14 is a clasp 116. The clasp 16 and 116 are adapted to engage a stocking 33. Instead of directly engaging the stocking the clasp 16 engages a mating clasp 216 on a strip 30 fast on said stocking 33 and extending vertically along the inner side of the stocking. The clasp 116 on tab 115 engages a vertical strip 32 on the stocking material, Figures 1 and 4. The strips 30 and 32 are united in any suitable manner, as by sewing, to the upper end of a foot sling 31 on each stocking 33 at the interior. The foot sling 31 is shown in Figure 2 as knitted or otherwise made an integral part of the stocking. In Figure 3 the strip 130 is shown united to a

foot sling 131 on a stocking 133, said foot sling being of any suitable fabric made originally separate from the stocking and sewed to the interior thereof. Thus, the foot sling 31 or 131 will be disposed beneath the arch of the foot when in use as shown in Figure 1. The stocking is further engaged by a clasp 22 on tab 215 and by a clasp 122 on tab 115 after the usual manner of engaging a garter with a stocking.

It is to be noted that the rings 18 are at the backs of the leg bands 14 and that the ligaments 11 extend through the rings 18 to the inner sides of the legs where engagement is effected between the clasps 16 on the ligaments and the clasps 216 on the stocking strips. The positioning of the guide ring 18 or equivalent guide means at the back of the leg and the fastening of the ligaments to the stocking strips 30 at the inner sides of the legs, result in an effective resistance by the ligaments along an oblique line extending from the hip laterally inwardly to the back of the legs and thence downwardly and forwardly to the inner sides of the legs as fully explained in my aforementioned application. The pull of the ligaments on the strips 30 on one side of the stocking is resisted by the strips 32 at the opposite side which strips 32 are connected with the leg band 14 by the clasps 116. With the described arrangement the heel is automatically lifted in walking and in order to overcome the resistance of the ligaments the user is compelled or at least finds it more natural to first bring the heel firmly down and then the toe or ball of the foot to bring about true heel and toe walking. Moreover, as in the case of the previous invention, the described arrangement tends to cause the user of the device to toe in slightly in walking, the heel and toe walking and toeing in contributing very materially to a pronounced activity of the muscles and tendons of the feet as well as the correction of defective bones in the feet particularly the arches; also, the action of the appliance on the foot tends to bring about ample blood circulation at the arches, all of which develops in the foot resistance to the falling of the arches and resists tendency toward flat feet and where arches are fallen and the feet are flat the appliance in compelling the heel and toe walking results in a restorative action on the muscles and bones besides bring about the necessary blood circulation. The provision of the foot sling 31 or 131 incorporated in the stocking together with the strips 30 (or 130) and 32 promotes the effectiveness of the appliance in relieving the legs and feet of undue stresses and strains in the corrective treatment.

Coacting with the belt 10 are suspenders designated generally by the numeral 35. In

order to coordinate the belt 10 with the suspenders 35, said belt is provided at the front thereof with short straps or billets 25 that extend above the belt and provided with fastening elements 26 at the back of the belt. Similarly a strap 125 has the fastening element 126. The fastening elements 26 are adapted to engage fasteners 27 on tabs 28 between the suspender ends and in a similar manner the fastener element 126 at the back of the belt is adapted to engage with a fastener element 127 at the back of the suspenders 35, said element 127 being on a depending tab 128 disposed between the rear suspender ends. At the front the suspenders at each front strap or shoulder strap is provided with adjusting buckle 40 of any approved form for adjusting the total length of the suspenders. By connecting the belt with the suspenders at the back and front through the medium of billets 25, 125 and the tabs 28, 128, with their co-engaging fastening elements, I bring about the important result that the strains on the ligaments 11 may be relieved, because upon slackening the shoulder straps of the suspenders 35 through the medium of buckles 40, the upward pull on the belt 10 and thus on the ligaments 11 is relaxed. Hence, if the user of the appliance finds the circulation particularly in the feet at the arches has been developed sufficiently, or if the correct walking that he is compelled to practice should tire the user, the appliance may be practically thrown out of action by relaxing the tension on the suspenders 35.

An important improvement results from connecting the ligaments 11 with the strips (30) associated with the stockings at the inside of the leg and connecting the strips 32 at the opposite side of the leg with the leg bands 14. Thus, the leg band resists any displacing tendency or twisting of the stocking and the foot sling 31 by the ligaments, and minimizes or obviates any discomfort to the wearer by the foot slings.

As in the patent referred to the ligaments 11 are formed with elastic and inelastic sections, the present arrangement including upper elastic sections 20 and lower inelastic sections 21 connected by an adjusting buckle 23.

I do not claim in the present application the provision of the ligaments directed obliquely from the waist belt to the back of the leg and then to the inner side of the leg nor the generic feature of the relation between the foot slings and the ligaments. The present invention is characterized by the foot sling incorporated in the stocking and the provision of the strips (30, 32, 130), the stocking strip (32) at the outside connecting with the leg band while the stocking strip (30, 130) connects with the ligament. The present invention is further character-

ized by the assemblage including the coordination of the waist belt with the suspenders in a manner that the tension on the ligaments is relieved by the loosening of the suspenders thus relieving the strains exerted by the belt and suspenders on the ligaments.

It will be readily understood that the stocking (33 or 133) serves of itself to a certain extent as a foot sling and that with the presence of the foot sling 31 or 131 reinforcing the stocking, the function as a foot sling is better served. At all events the connection of the stockings with the leg bands 14 at one side of the stockings and the connection of the stockings at the opposite side with the ligaments insure the desired action in relieving the feet of undue stresses and at the same time the stockings are held against displacement and exert no discomfort or undue strains on the feet.

I would state, furthermore, that while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the exact details herein illustrated, since, manifestly, the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. An appliance of the class described to bring about heel and toe walking, said appliance comprising elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, means to hold the ligaments at the upper ends, leg bands adapted to be applied to the legs of the wearer, stockings, foot slings incorporated in said stockings, means to connect the foot slings with the ligaments at the inner sides of the legs, and means to connect the foot slings with said leg bands at the outer sides of the legs.

2. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments, foot slings, means to connect said elements with the foot slings, waist belt to which the upper ends of the ligaments are secured, suspenders adjustable to vary their length, and means connecting said suspenders with said waist belt so that the lengthening of the suspenders will relax tension on the ligaments.

3. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, means to hold the ligaments at their lower ends to the inside of the legs near the feet, a waist belt to which the upper ends of the ligaments are connected, suspenders connected with said belt to sustain the same and subject the ligaments to tension,

and means to adjust the suspenders to increase or decrease the pull on the belt for varying the tension on the ligaments.

4. In an appliance for use in subjecting the feet and legs to corrective treatment, a waist belt, billets extending upwardly from said belt, suspenders, and coacting fastener means on said billets and on said suspenders at the back and front of the latter; together with ligaments suspended from said belt and adapted to be disposed along the legs of the wearer, and means to hold said ligaments at their lower ends to the legs of the wearer.

5. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, foot slings connected at one side with said elongated elements, leg bands, and means on the leg bands adapted to connect with the foot slings at the opposite sides from the connections between the slings and the ligaments.

6. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, stockings connected at one side with said elongated elements, and leg bands adapted to connect with the stockings at the opposite sides, said ligaments being free to have up and down movement independently of and relatively to the leg bands.

7. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, stockings connected at one side with said elongated elements, and leg attachments adapted to connect with the stockings at the opposite sides, said stockings having means reinforcing the same at the arch and sides.

8. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, foot slings connected at one side with said elongated elements, leg bands, and a depending member on each leg band and adapted to connect with the respective foot slings at the opposite side from the connection of the foot slings with the elongated elements.

9. In an appliance for use in subjecting the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, stockings, means to connect the stockings at one side with said elongated elements, leg bands, and means to connect the leg bands with said stockings at the opposite sides from the means to connect said elements with said stockings.

10. In an appliance for use in subjecting

the feet and legs to corrective treatment, elongated elements constituting ligaments adapted to be disposed along the legs of the wearer, stockings, means to connect the stockings at one side with said elongated elements, leg bands, means to connect the leg bands with said stockings at the opposite sides from the means to connect said elements with said ligaments; together with additional means on said leg bands to connect with the stockings independently of the connection of the stockings with said elements and said leg bands. 10

JOHN J. COOPER.