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ARTIFICIAL LIMB

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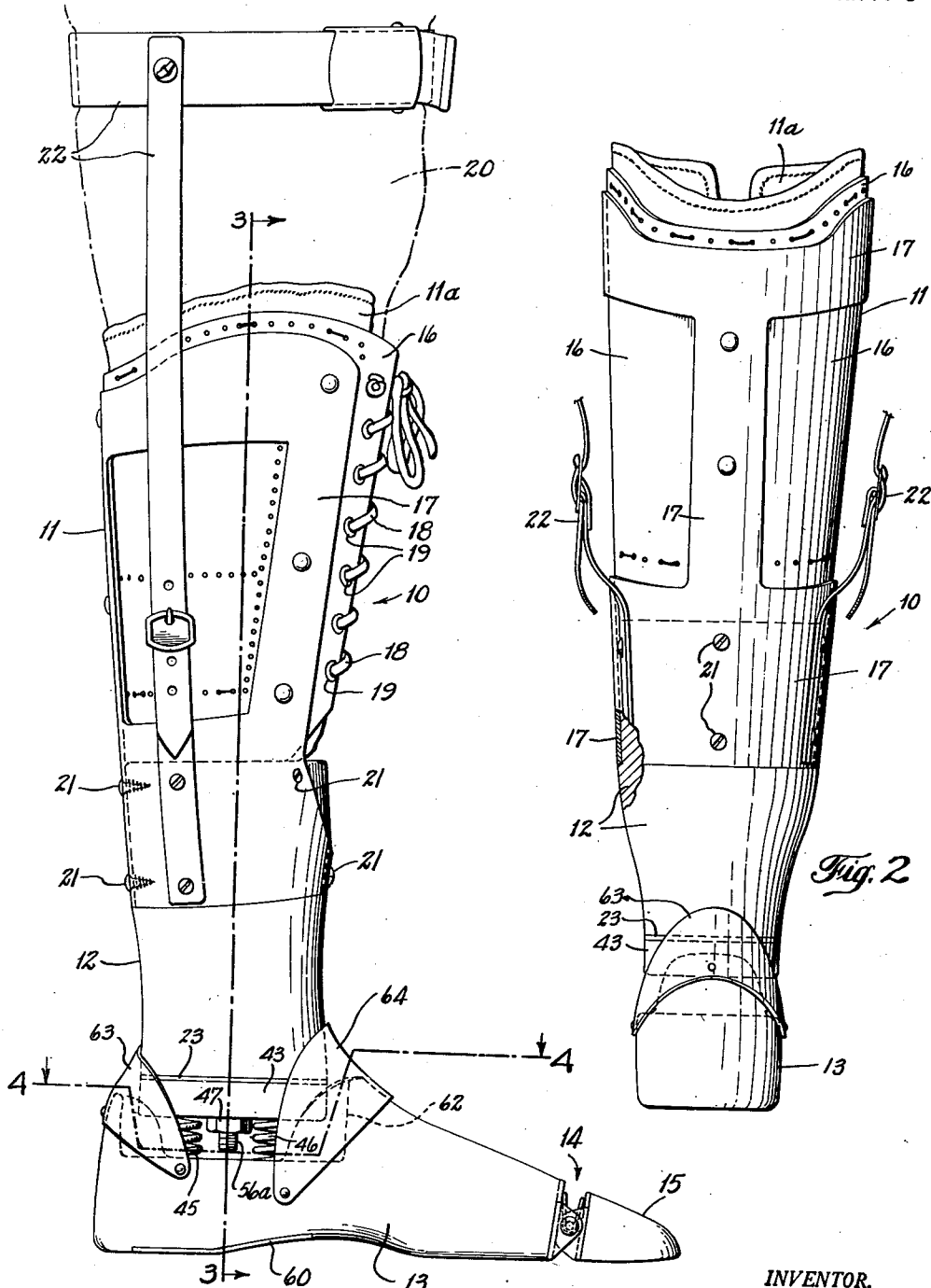


Fig. 1

Fig. 2

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This invention relates to an artificial limb and more particularly to an artificial leg for use with legs amputated below the knee.

It is an object of my invention to provide an artificial leg which will simulate the appearance and action of the normal leg.

Another object of my invention is to provide an easily attachable artificial leg which will afford comfort to the wearer and ease of use and application so as to substantially duplicate the function of a real limb of the wearer.

Still another object of my invention is to provide an artificial limb which will afford and simulate natural and balanced articulated movement of the ankle and tarsal and metatarsal portions of the foot.

One other object of my invention is to provide an economically and easily constructed universal type of artificial leg which will avoid strain on the wearer when the leg is worn and which will permit easy swing and movement of the body of the wearer during walking.

Still another object of my invention is to provide an adjustable readily usable relatively comfortable artificial leg providing a flexible springy foot portion affording easy walking movement to the wearer thereof.

A specific object of my invention is to provide an artificial leg comprising a ventilated and well padded stump socket with lacing to adjust the leg to the thickness of the stump, a peg, an adjustable foot for the peg permitting lateral and longitudinal movement of the heel portion of the foot and a spring loaded toe joint to permit proper balance during walking and use of said leg.

Other objects and features of my invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side view of a preferred embodiment of my invention as applied to an amputated leg;

Fig. 2 is a rear view of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a plan bottom view taken of a support member in Fig. 5;

Fig. 7 is a sectional view of a tool member used for relative adjustment of the foot with the upper part of the embodiment;

Fig. 8 is a partly sectional view of another tool member and

Fig. 9 is a sectional view taken on line 9—9 of Fig. 8.

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Referring now to the drawings in which similar references denote like parts throughout, I show an artificial leg 10 provided with a stump holding slip socket 11, a peg 12, a spring movable foot 13 with a pivotal toe joint 14 and a toe portion 15.

Said socket is preferably of leather 16 reinforced with a brace 17 made of suitable light material, such as aluminum. The socket simulates the upper of a leather lace boot and has a leather thong or lace 18 extending through eyes 19 in the front part of the socket to permit adjustment of the leg stump 20 therein, while at the same time allowing for ventilation of the socket.

The inside of said socket is lined with any suitable soft, pressure relieving, material 11a such as cotton, felt, fur, quilt or corduroy in which the ribs may run longitudinally or horizontally. Such type of liner extends over the socket 11 and may be of any desired thickness so as to reduce to a minimum the discomfort caused by the constant pressure of the stump against the socket.

Brace 17, as noted from the drawings, forms a frame and has its lower portion rounded for connection and attachment in any suitable manner such as by means of screws 21 to peg 12 to form a rigid but lightweight unit. The brace is also provided with a harness 22 for attachment of the artificial leg to stump 20.

Peg 12 is made preferably of light but strong material such as wood or of plastic material and may be molded when produced in large quantities. Furthermore, it is shaped to simulate a natural leg and may be adjusted to size according to the height of the wearer.

Underneath said shank or peg is a member or plate having a central opening 24 through which passes a screw bolt 25 screwed into or fixed to the interior and the center of shank 12. It will be noted that said peg 12 is further provided with a plurality of equispaced openings or sockets 26, 27, 28 and 29 respectively, for accommodating the heads of bolts 30, 31, 32 and 33 respectively which pass through the respective openings 34, 35, 36 and 37 of the plate 23 and through clover shaped openings 39, 40, 41 and 42 respectively, of support member 43. Said openings 39, 40, 41 and 42 extend downwardly into concentric seats or sockets 39', 40', 41' and 42', respectively, surrounding said bolts 30, 31, 32 and 33 respectively. Support member 43 is held firmly against peg 12 by means of bolt screw nut 47 which can be adjusted thereon in any suitable manner but preferably with the tool shown in Fig. 8.

Bolts 30, 31, 32 and 33 extend downwardly from peg 12 into the respective openings 48, 49, 50 and 51 of foot 13 and are held in relatively fixed position by means of washers and nut members

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52, 53, 54 and 55', respectively. Said foot 13 is also provided with an opening 55 into which can be passed tool 56 connecting with threaded end 56a for adjusting the compression on springs 43', 44, 45 and 46, respectively between the foot and the peg 12, so as to suit the convenience and comfort of the wearer of the artificial leg. It will be noted that said tool 56 is provided with threaded socket end 57 for connection with threaded end 56a of screw bolt 25, and with an adjustable rotatable plate 58 which will rest against the sole of foot 13 when the compression of the springs is adjusted. In other words by the use of this tool any of the springs between the peg and the sole can be regulated so that the desired springiness and balance in the device are afforded to the use of the leg. Once the proper adjustment is made, washers and nut members 52, 53, 54 and 55 are screwed into position and socket wrench 59 tightens the washer and nuts in position as shown in Fig. 5. It is apparent that the tool 56 remains in connection with the threaded end 56a of screw bolt 25 so as to keep said springs under proper compression while said nuts are tightened by socket wrench 59. A closure plate 60 is provided in the sole of foot 13 to cover openings or recesses 48, 49, 50 and 51, and is held in place by means of screws 61.

As seen from the drawings, said foot 13 has a sufficiently large recess 62 between the heel and instep to permit the desired insertion of peg 12 thereinto and provide sufficient clearance for freedom of relative movement whether swivel, lateral or longitudinal of the foot and peg by means of spring members 43', 44, 45, and 46. Also, said foot is provided at the recessed portions with protective shields 63 and 64 to prevent rubbing of socks and clothing of the wearer against the movable parts and thereby prevent their ripping or tearing.

From the foregoing description of my invention taken in conjunction with my drawings, it will be noted that I provide an artificial leg which is comfortable to the wearer, is easy to adjust as to compression when the wearer puts his weight on the leg so that there is attained the desired springiness between the foot and peg portions of the leg. Furthermore, by my invention there is relative ease of movement of the peg with respect to the foot so that there is easy lateral, forward, rear or swivel movement of said peg and foot around said spring members. Also, because of the spring loaded toe and the flatness of the sole there is ease in balance when the wearer of the embodiment of my invention stands or walks.

There are no bearings to become rusty or to be oiled, also the foot portion does not tilt due to any beveling of the sole. Furthermore, once the adjustment of the spring members is made in the foot, no further adjustment is necessary.

Another feature of the invention is that it can be used on either leg stump thereby obviating the necessity of having a right or left artificial leg.

While preferred embodiments of the invention have herein been described and illustrated, it is to be understood that modifications as to form, arrangement of parts and use of materials may be made without departing from the spirit and scope of the invention as claimed.

What is claimed is:

1. An artificial leg comprising an inner lined padded socket portion for a natural stump, anchor means depending from the socket, a plurality of equispaced members depending from the

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socket said socket having recesses therein, compressible spring members around each of said equispaced members depending from the recesses of said socket, a foot member for accommodating said equispaced members and holding the spring member in position, said member having corresponding sockets for the spring members, and fastening means for holding the foot member against the spring members.

2. An artificial leg comprising a padded ventilated socket portion for a natural stump, threaded anchor means depending from the longitudinal axis of the socket, a plurality of equispaced members depending from the socket, compressible spring members around each of said equispaced members depending from the socket and adapted to rest there against, said spring members being disposed around said anchor means, a recessed foot member for accommodating said equispaced members and for holding the spring members in relatively vertical position, and fastening means in the foot member for holding the foot member against the spring members, said spring members being independently compressible to permit lateral, forward and rearward bending of the socket with respect to the foot member.

3. An artificial leg comprising a padded socket portion for a stump, a peg connected to the stump, anchor means axially extending from the peg, said peg having a plurality of upwardly extending recesses therein, a plurality of equispaced members depending from the recesses of said peg, spring members around each of said equispaced members depending from the peg, a foot member having corresponding recesses for accommodating said equispaced members and holding the spring members in position, and adjustable means for holding the foot member against the spring members.

4. An artificial leg according to claim 3, in which the leg is provided with a plate and support member having a plurality of equispaced clover shaped openings therein for accommodating the anchor means and the equispaced members respectively, said equispaced members riding in said openings.

5. An artificial leg wherein there is an all round type of relative motion between the foot and the stump thereof, comprising a stump holder, removable means depending from said holder having a plurality of equispaced openings and recesses therein, adjustable fixing means depending from the openings, a foot member having aligned, corresponding openings and recesses for said fixing means, and a plurality of compressible spring members surrounding each of the fixing means and accommodated between the recesses of the removable means and the foot member whereby the holder and foot portion can be relatively moved in an articulated manner simulating natural leg and foot motion.

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