

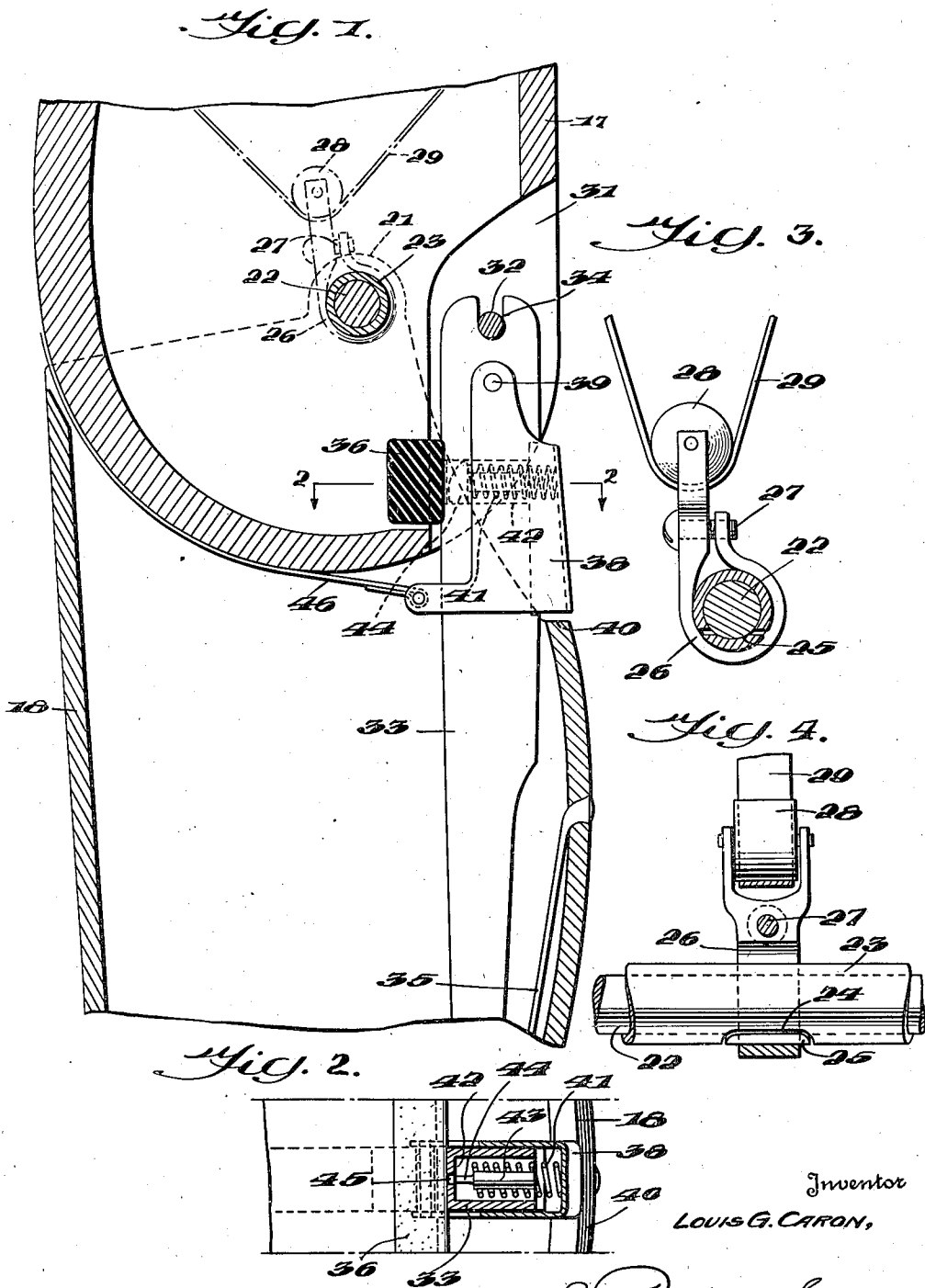
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2,393,142

ARTIFICIAL LIMB

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UNITED STATES PATENT OFFICE

2,393,142

ARTIFICIAL LIMB

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Application May 25, 1944, Serial No. 537,238

4 Claims. (Cl. 3—2)

This invention relates to an improvement in artificial limbs of the character constructed of thigh and lower leg members articulated together.

This application is filed as a division of my prior application for Artificial limbs, filed March 15, 1943, Serial No. 479,257.

The thigh and lower leg members are usually pivoted together for relative swinging movement. The pivot is usually connected with a shoulder strap or waist-band strap, but the manner in which this has been constructed heretofore has caused great wear on the knee bolt.

One object of this invention is to improve the construction of the pivotal connection between the thigh and lower leg members. This is accomplished preferably by distributing the wear uniformly around the knee bolt, through a clamped connection between the bolt and its sleeve, that may be adjusted as required.

A further object of the invention is to improve the manner of operation of the knee joint and to control the operation thereof, particularly as to the lock of the thigh and lower leg members in straight-line positions.

A control is provided for the knee action which will allow relative swinging movement between the thigh and the lower leg sections to check the relative swinging movement therebetween, as well as to control this movement, tending to stop the swinging movement of the lower leg section when in straight-line position relative to the thigh section and holding said part in this position until released by the user. For this purpose, the check lever is provided with a catch which engages automatically a part of the lower leg member when the latter is in the straight-line position, and which catch may be released when desired. The construction of the catch is such that it is substantially noiseless so as to be unobjectionable in use.

I have illustrated these features of the invention in the accompanying drawing, in which:

Fig. 1 is an enlarged vertical section through the knee joint connecting the thigh and lower leg members, parts being in elevation;

Fig. 2 is a detailed cross section therethrough on the line 2—2 of Fig. 1;

Fig. 3 is a detailed cross section partly in elevation, through the knee bolt showing the knee tightener applied thereto; and

Fig. 4 is a side elevation partly in section thereof, substantially at right angles to Fig. 3.

The invention is adapted to be applied to thigh and lower leg members of the usual or desired

character which are pivotally connected together by means of a knee action. These members are usually shaped to correspond substantially with the portions of a natural limb. While they may be constructed in any suitable manner or of any desired material, I have set forth in my prior application for Artificial limbs, filed March 15, 1943, Serial No. 479,257, one manner of constructing these members, which may be followed, if desired, according to this invention.

The thigh member is designated generally by the numeral 17, and the lower leg member, by the numeral 18. The lower leg member is finished with ears designated generally at 21 which are connected together by a knee bolt 22 extending through a sleeve 23. The sleeve 23 is fixed at opposite ends to the thigh member 17 while the bolt is fixed to the ears 21 of the lower leg member 18. The relative swinging motions of these parts causes turning movement between the bolt 22 and the sleeve 23, which are relatively loose.

Provision is made for equalizing the wear on the bolt 22 as a result of this turning movement instead of limiting the wear solely to the top of the bolt as has often resulted heretofore. For this purpose, a portion of the sleeve 23 is cut away at 24 and a segment 25 is applied thereto in position to bear directly against the periphery of the bolt 22. A strap 26 extends about the sleeve 23 and has its opposite end portions drawn together by a screw 27, thereby forming a clamp for pressing the segment 25 adjustably against the bolt 22.

In this way, the bolt and sleeve may be clamped in tight frictional relation to prevent looseness therebetween. This has the effect of distributing the wear uniformly around the bolt 22, instead of confining it entirely to the upper surface thereof as heretofore. The upper end of the clamp 26 may be provided with a roller 28 under which a strap 29 extends, said strap passing upward therefrom to the usual waist band or suspenders.

It will be evident that the one knee-control strap 29, is connected also with the knee-joint tightener and thereby insures the maintenance of proper knee action.

At the back, the thigh member is cut-away or recessed at 31 opposite the knee bolt 22, and a pin 32 is fixed in this recessed portion of the thigh member. A check lever 33 has a slotted end portion 34 fitting loosely about the pin 32, and extending downwardly therefrom in the lower leg member 18. The lower end of the check lever 33 is connected by the usual flexible band 35 with the

lower leg member, and serves to check the forward swinging movement of the lower leg member relative to the thigh member 17. A rubber bumper 36 is fixed in the thigh member 17 in position to be engaged by the forward face of the check lever 33 when the parts are in straight-line position.

I have provided a catch for holding the parts in this relation until desired to be released. This catch is designated generally at 38 and is shown as formed of U-shape in cross section embracing opposite sides of the check lever 33, being pivoted thereto at 39. The lower edge of the catch 38 is adapted to overlies a shouldered upper edge 40 at the back of the lower leg member 18, when the catch is in its locking position, as shown in Fig. 1.

The catch 38 is normally held in this position by a coiled spring 41 (Fig. 2) housed within a recess 42 in the check lever 33, and said spring 41 is sleeved over a guide pin 43, having a head 44. The head 44 will project through an orifice 45 in the forward face of the lever 33 and apply tension to the coiled spring 41 to restore the catch 38 to its latching position. The spring 41 should have just enough tension to push the catch 38 to its latching position so that it will latch the parts in their straight-line relation without "snap" or noise that would be objectionable.

The catch 38 is shown as provided with a strap 46 which extends to the usual suspenders or waist-band for release of the catch, when it is desired to swing the limb members.

This construction provides for proper control of the knee action which will be effect in operation.

I claim:

1. In an artificial limb, the combination of thigh and lower leg members pivotally connected together for swinging movement to straight-line relation, a check lever pivoted to the thigh member and extending into the leg member, a catch pivoted to said check lever in position to engage the leg member to hold the same in extended relation, a flexible device extending upwardly beside at least a portion of the thigh member lengthwise thereof from the catch and operatively connected with said catch for releasing said catch, and resilient means acting on said

catch tending to move the same to latching relation.

2. In an artificial limb, the combination of thigh and shin members pivotally connected together for relative swinging movement, said shin member having a shoulder at the upper edge thereof, latching means pivotally mounted on the thigh member in position to engage said shoulder and hold the members in straight-line relation, yielding means acting on said latching means tending to move the same to latching position with the shoulder, and a flexible strap connected with the latching means and extending upwardly therefrom beside the thigh member for swinging said latching means away from latching relation with the shoulder to permit relative movement of the members.

3. In an artificial limb, the combination of thigh and lower leg members, a knee joint connecting said members together and including a sleeve and a bolt telescoped with each other and respectively connected with the respective members, a clamping segment in a side of the sleeve and bearing against the bolt, and a clamp embracing the sleeve and segment and with opposite sides extending to the opposite side of the sleeve from the segment, and means for adjustably connecting said opposite sides of the clamp together for adjusting the segment relative to the sleeve and bolt.

4. In an artificial limb, the combination of thigh and shin members pivotally connected together for swinging movement, means forming a shoulder on the shin member, a lever pivoted to the thigh member and extending into the shin member adjacent the shoulder, a catch substantially U-shaped in cross-section with lateral sides embracing the lever and extending upwardly along the lever on the edge portion thereof facing the shoulder, means pivotally mounting the catch on the lever for engagement of the lower edge portion thereof with the shoulder, resilient means confined between the closed side of the catch and the lever normally tending to press the catch into engaging position with the shoulder, and an actuating strap connected with the catch and extending upwardly beside the thigh member for releasing the catch from the shoulder.

LOUIS G. CARON.

CERTIFICATE OF CORRECTION.

Patent No. 2,393,142.

January 15, 1946.

LOUIS G. CARON.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the heading to the printed specification, line 4, strike out the word "Application" and insert instead --Original application March 15, 1943, Serial No. 479,257. Divided and this application--; in the heading to the drawing, line 3, for "May 25, 1944" read --March 15, 1943--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of April, A. D. 1946.

Leslie Frazer

First Assistant Commissioner of Patents.

(Seal)