

March 27, 1962

C. E. PEACH

3,026,869

ORTHOPEDIC LEG BRACE

Filed March 12, 1957

2 Sheets-Sheet 1

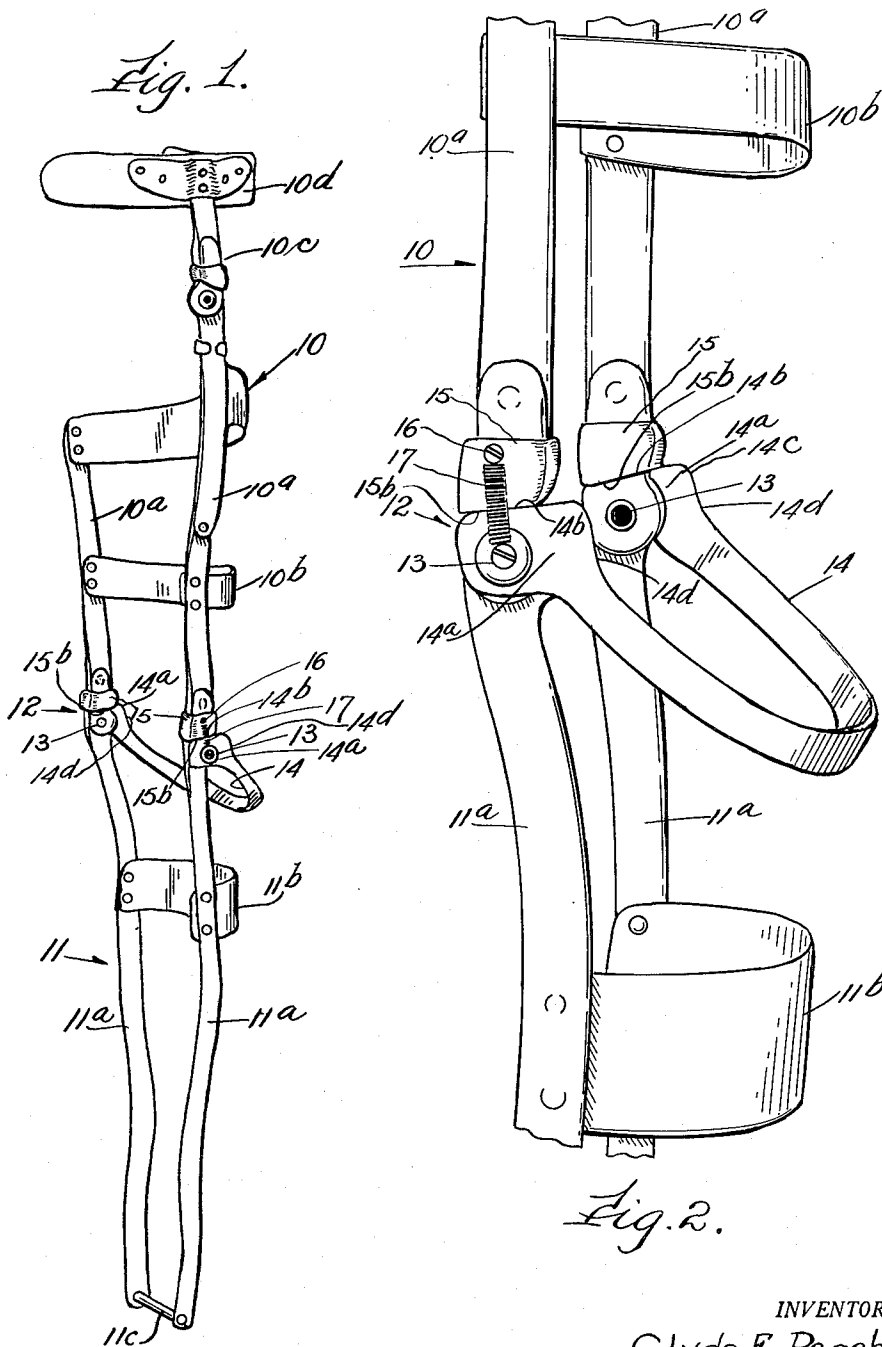


Fig. 2.

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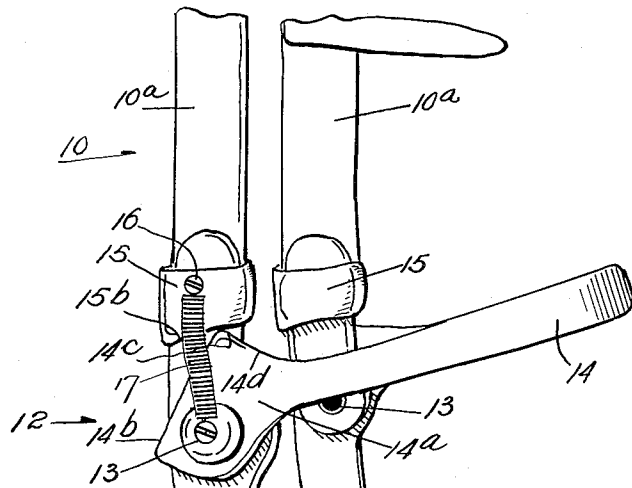


Fig. 4.

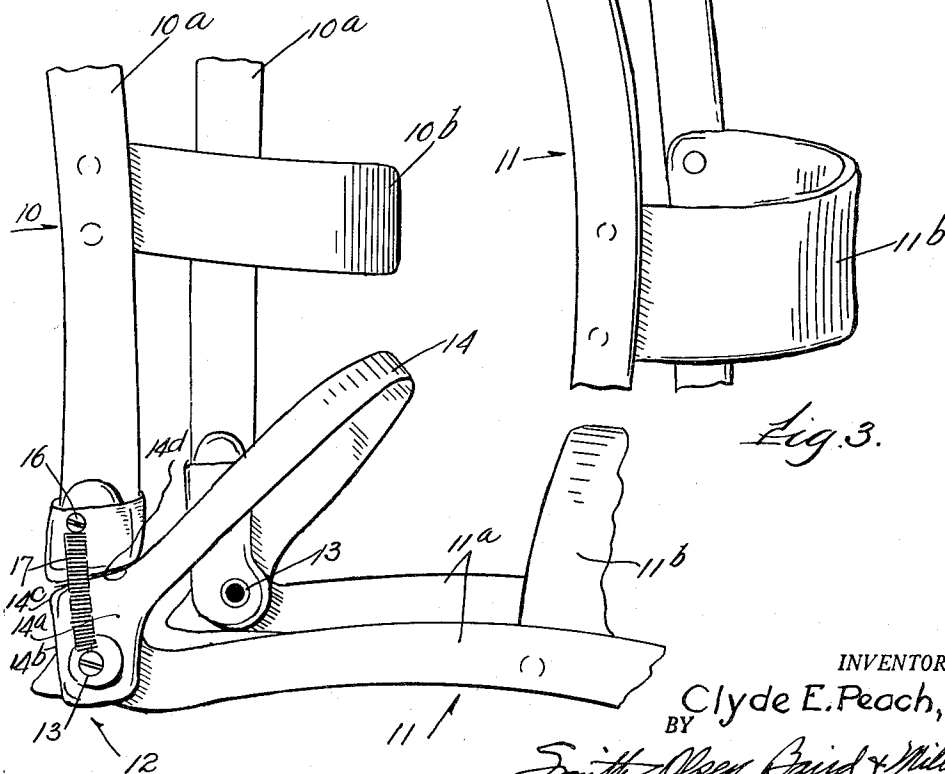


Fig. 3.

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ORTHOPEDIC LEG BRACE

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Filed Mar. 12, 1957, Ser. No. 645,624
5 Claims. (Cl. 128—80)

This invention relates to improvements in orthopedic braces and its purpose is to provide novel means for permitting and controlling relative movement of the thigh portion and the lower leg portion of a leg brace.

Previous efforts to provide an adjustable leg brace having a knee action and means for securing the parts in adjusted position have not been satisfactory because these prior devices have included too many relatively movable parts and inadequate means for securing the parts after adjustment.

The principal object of the present invention is to provide improved locking means for the knee joint of a leg brace. A further object is to provide a leg brace of simplified construction which may be built at relatively small cost and which may be readily assembled and repaired. Another object is to provide a leg brace having a double lock for the knee joint. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment of the invention is illustrated. In the drawings,

FIGURE 1 shows a perspective view of the complete leg brace with the thigh portion and the leg portion held in substantial alignment;

FIG. 2 shows an enlarged perspective view of the knee portion of the brace and adjacent parts in the relative positions which they occupy in FIG. 1;

FIG. 3 shows a perspective view similar to that of FIG. 2 after the bail which extends under the knee has been partially operated to release the knee locking mechanism; and

FIG. 4 is a perspective view of the knee portion of the brace after the knee lock has been fully released and the lower leg portion has been turned to a position at right angles to the thigh portion.

As illustrated in the drawings, the invention is embodied in a leg brace comprising an upper leg portion 10 and a lower leg portion 11 which are connected together by a hinged locking device 12. The upper leg portion 10 comprises side frame members 10a which are connected by metal loops 10b adapted to extend around the rear side of the thigh of the wearer. One side frame member 10a extends upwardly as shown at 10c and has secured thereto a curved metal plate 10d which is adapted to be strapped to the hip of the wearer.

The lower leg portion 11 comprises two side frame members 11a which are connected at their lower ends by a rod 11c adapted to extend beneath the foot of the wearer and the upper portions of these side frame members are connected by a metal loop 11b adapted to extend around the rear side of the calf of the wearer. As is well known, the portions 10a and 11a of the brace are adapted to be secured to the leg by means of bandages and the like.

The present invention is directed particularly to the construction of the hinged connection 12 by which the parts 10 and 11 are connected to each other. This construction comprises pivot pins 13 in the form of rivets which extend through the lower ends of the members 10a and through the upper ends of the associated lower parts 11a at each side of the brace. These rivets 13 also extend through a bail 14 which is adapted to extend

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around the rear portion of the knee of the wearer behind the knee joint. This bail is provided at its ends with enlarged heads 14a which form locking cams having flat locking surfaces 14b which are adapted to coact with the lower flat cam surfaces 15b of blocks 15 mounted on opposite sides of the brace and which embrace the lower ends of the leg portions 10a and have a sliding engagement therewith. These blocks 15 are normally moved to their lower positions and are held in engagement with the cams 14a by coil springs 17 which extend between the pins or rivets 13 and pins 16 secured on the block 15.

When the thigh portion 10 is in alignment with the lower leg portion 11, as shown in FIG. 1, the parts are held in this aligned arrangement by the coaction of the flat locking surfaces 14b of the cams 14a with the lower flat faces 15b of the blocks 15, as shown particularly in FIG. 2, and this arrangement is normally maintained by means of the coil springs 17.

The springs 17 are contracted when the leg portions 10 and 11 are in alignment and the blocks 15 are then held in position to maintain the locking engagement of the cam portions 14a with the blocks 15 but, when it is desired to bend the lower leg portion 11 with respect to the upper leg portion 10, to allow the corresponding bending of the knee of the person wearing the brace, the bail 14 is moved from the position shown in FIG. 2 to the position shown in FIG. 4. In the process of turning the bail 14 toward the position shown in FIG. 4, it passes through the intermediate position shown in FIG. 3 where the projecting heel portion 14c of each cam 14a rides along the lower flat surface 15b of the associated block 15 while extending the connected spring 17, thereby elevating the two blocks 15 and releasing the lower leg portion 11, so that it may be bent with respect to the upper leg portions 10 until it finally reaches the position shown in FIG. 4. In this position, the springs 17 are again somewhat contracted and they hold the end surfaces 14d of the cams 14a in engagement with the surfaces 15b of the blocks, thereby releasably securing the lower leg portion 11 in a position substantially at right angles to the upper leg portion 10. When it is desired to restore the parts 10 and 11 to a position where they align with each other as shown in FIG. 1, the bail 14 may be restored to the position shown in FIG. 2 and, in the process of so doing, the lower leg portion 11 may again be swung to the aligning position. By this arrangement a simplified form of apparatus is provided for securing the hinged leg portions of the brace in either aligning positions or in angularly disposed positions and the relative movement of the two parts of the brace may be easily controlled by the manipulation of the bail 14.

Although one form of the invention has been shown and described by way of illustration, it will be understood that it may be constructed in various other embodiments which come within the scope of the appended claims.

I claim:

1. An orthopedic leg brace comprising an upper leg portion, a lower leg portion, said leg portions being connected for relative movement about a pivotal axis, a cam pivotally mounted on said portions for movement relative thereto about said axis and having a locking surface and an end surface and a heel portion between said locking surface and said end surface, a block movably mounted on one of said leg portions and having a cam surface adapted in one position of said cam to coact with said locking surface to lock said leg portions against relative movement and to cooperate with said heel portion upon pivoting of said cam to unlock said leg portions and to permit movement thereof to a position substantially perpendicular to each other and thereafter to coact with said end surface, and means mounted on said portions and operatively associated with said block resil-

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iently urging said block toward said cam whereby to hold said parts in the position in which they are placed until positive actuation of said cam by the user.

2. An orthopedic leg brace as set forth in claim 1, wherein the means to hold the block against the cam comprises a spring interconnecting the block and the other leg portion.

3. An orthopedic leg brace as set forth in claim 1, wherein said locking surface and said end surface are substantially flat and disposed at an angle with respect to each other.

4. An orthopedic leg brace comprising, an upper leg portion, a lower leg portion, said portions being connected for relative movement about a pivotal axis, a cam pivotally mounted on said portions for movement relative thereto about said axis and having a locking surface and an end surface and a heel portion between said locking surface and said end surface, and a block movably mounted on one of said leg portions and having a cam surface adapted in one position of said cam to coact with said locking surface to lock said leg portions against relative movement and to cooperate with said heel portion upon pivoting of said cam to unlock said leg portions and to permit movement thereof to a position substantially perpendicular to each other and thereafter to coact with said end surface.

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5. An orthopedic leg brace comprising, an upper leg portion, a lower leg portion, said portions being connected for relative movement about a pivotal axis, a cam pivotally mounted on said portions for movement relative thereto about said axis and having a flat locking surface, a block slidably mounted on one of said portions and having a flat surface adapted to engage said first named flat surface to hold said portions in alignment, and a spring mounted on said portions and operatively associated with said block for holding said block in engagement with said cam.

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