

[54] **ARTIFICIAL LIMB JOINTS**

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[22] Filed: **Oct. 30, 1972**

[21] Appl. No.: **301,846**

[52] U.S. Cl. 3/1, 128/92 CA, 128/83,
128/92 EC

[51] Int. Cl. **A61f 1/24**

[58] Field of Search 3/1; 128/92 C, 92 CA, 92 E,
128/92 EC, 92 F, 92 G, 83

[56] **References Cited**

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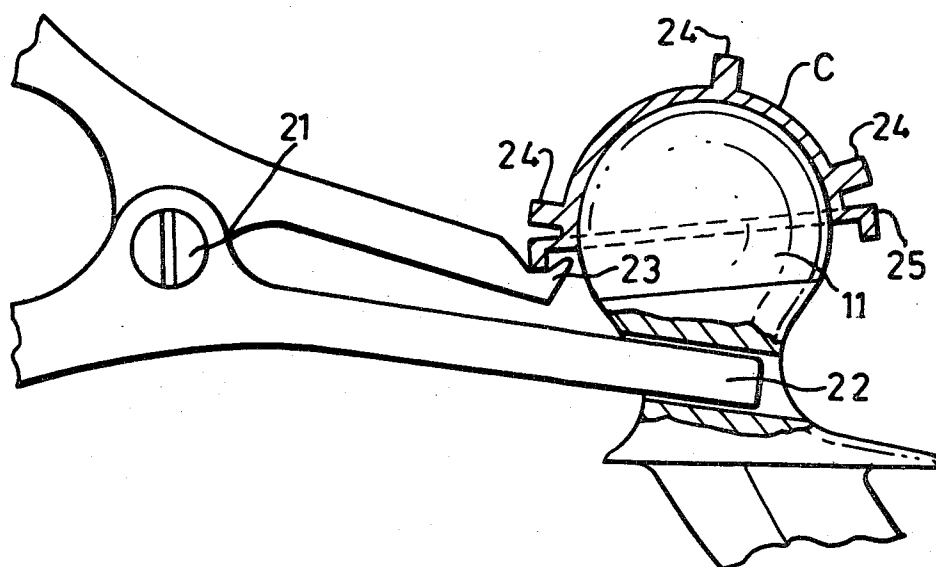
Attorney, Agent, or Firm—Emory L. Groff; Emory L.
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[57]

ABSTRACT

An artificial hip joint has a cup-like socket portion into which a ball engages. A limb engaging stub depends from said ball and has a waisted portion below the ball and flange beneath the waisted portion. A bore of non-circular cross-section is provided in the waisted portion and an introducer and extractor tool has a limb whose end portion fits into the bore for non-rotatable engagement therein. A tong-like dislocator tool is provided and includes two arms, the end of which engage the bore and flange respectively.

4 Claims, 6 Drawing Figures



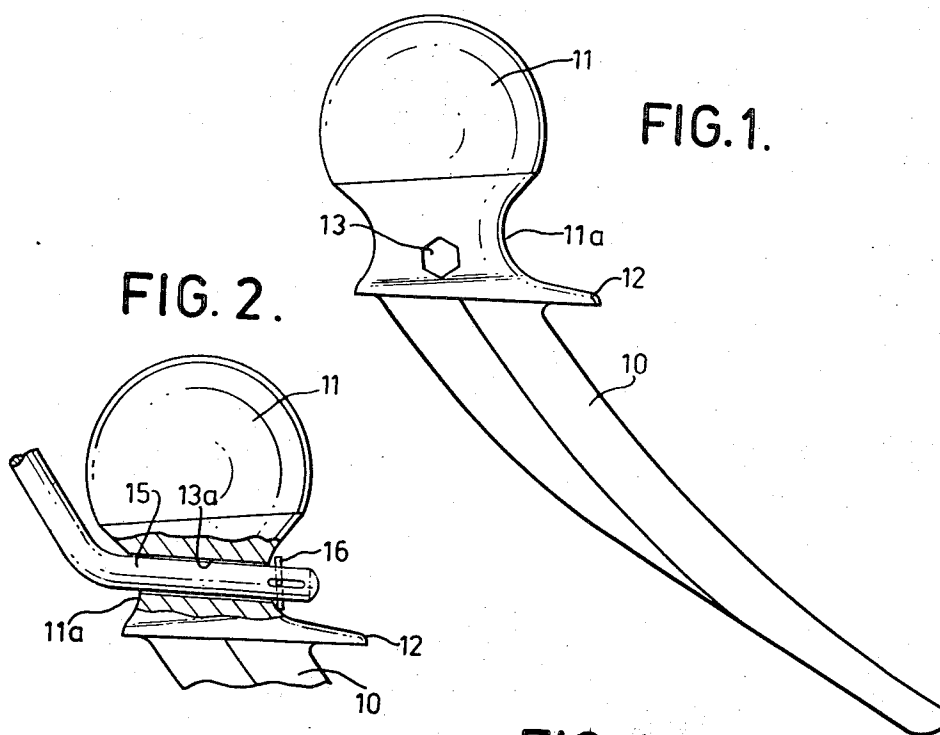


FIG. 4.

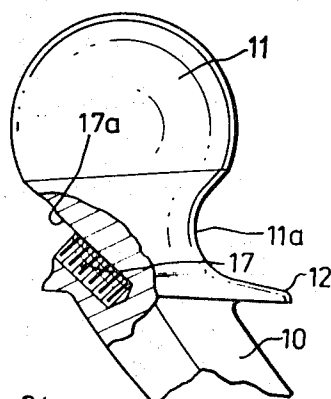


FIG. 6.

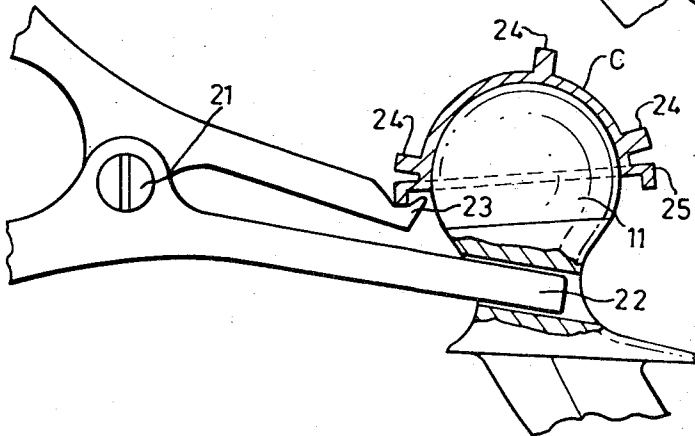


FIG. 3.

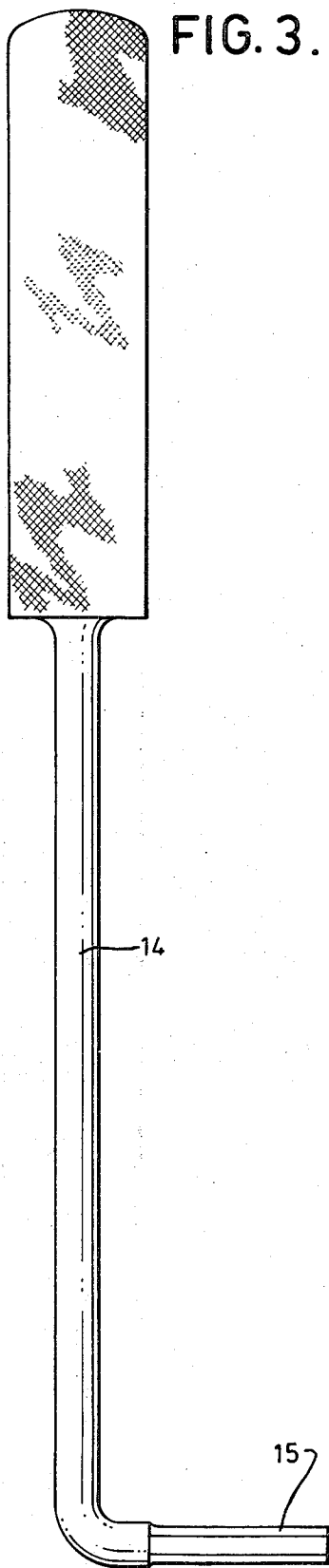
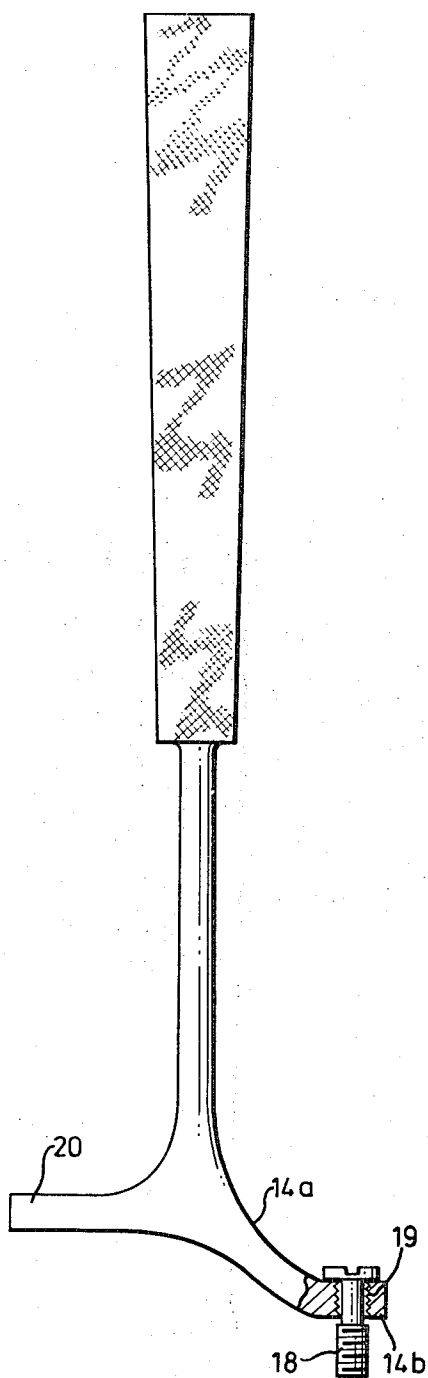


FIG. 5.



ARTIFICIAL LIMB JOINTS

BACKGROUND OF THE INVENTION

This invention concerns artificial limb joints, particularly ball and socket joints such as artificial hip joints in which the limb has an artificial ball head which engages in an artificial socket or cup or in the natural socket. Such artificial joints are known having a femoral limb portion comprising a spigot with an offset ball head which replaces the upper end of the femur, the portion being introduced or extracted from the limb bore by a tool engaging in the end of the shank.

The object of this invention is to provide a construction of limb portion in which manipulation thereof during engagement and fitting is simplified and assisted compared with known constructions, particularly with regard to the insertion and location in the femur during an operation.

SUMMARY OF THE INVENTION

According to the invention, the artificial hip joint comprises a cup like socket portion, and a ball adapted to engage in said socket portion, a limb engaging stub depending from said ball, a waisted portion below said ball, a flange below said waisted portion from which flange said stub depends and a bore through said waisted portion.

Further the invention comprises in combination with a joint as above set forth, an introducer/extractor tool having a limb end portion for non-rotatable engagement in said bore.

The invention also includes additionally a cup-like socket portion having a circumferential border flange and in combination a tongs-like dislocator tool, said tool having an end part of one arm to engage in said bore, and an end part of the other arm to engage said flange.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference will now be made to the accompanying drawings illustrating various preferred embodiments according to the invention and in which:

FIG. 1 is a side view of one form of limb portion,

FIG. 2 is a similar fragmentary view of another form, showing the end of the tool engaged,

FIG. 3 shows a preferred form of tool for use with the limb portion shown in FIG. 1,

FIG. 4 illustrates another form of limb portion,

FIG. 5 a preferred form of tool for use with the limb portion of FIG. 4, and

FIG. 6 shows how a dislocator tool can be used to disengage the ball from its cup socket.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to FIGS. 1, 2 and 4, the limb portion comprises a stub 10 adapted to engage into the upper end of the natural limb after the ball has been removed, this stub being appropriately shaped and curved in conformity with the natural limb. A ball head 11 above the stub is to engage in a complementary cup such as a cup C shown in FIG. 6, or in the natural cup, and a waisted portion 11a is formed at the lower end of the ball 11, below which portion is a flange portion 12.

A bore or hole is made into the part below the ball head. As shown in FIG. 1 the hole 13 extends through the waisted portion and is of hexagonal cross-section. The tool for use with this construction consists of a

handled rod 14, with a bent over end, formed hexagonally at 15 to engage in the hole 13. The relative angle of engagement from the six of the hexagon can be selected as desired.

The hole 13 need not necessarily be hexagonal but can be of other non-circular cross-section with the tool end appropriately shaped to engage therein without relative turning movement. In FIG. 2, the hole 13a is oval, and the end 15 of the tool correspondingly shaped. The ends (and holes) can if desired, taper slightly to provide a wedge fit. Alternatively or as well, the hole engaging end can be provided with means to hold the said end against accidental withdrawal from the hole on an extraction, one such arrangement being shown diagrammatically in FIG. 2. A pin 16 is pivoted near to the end in a slot the arrangement being such that the pin is coaxial with the end when the tool is engaged to the limb portion, and can then be turned through a right angle to form a T-end. Other arrangements, such as a screw on cap could be provided.

In the form illustrated in FIG. 4, a screw-threaded blind bore 17 is made in the waisted portion in a general downward direction, there being a cross-cut 17a at the top. The tool for use with this form (FIG. 5) has a laterally extending lower end 14a with a screw 18 engaging in a threaded bore 19. The screw 18 can be threaded into the bore 17, and the underside of the end 14a is cut away to leave a tongue 14b so that the tongue can engage in the cross-cut 17a, and the screw tightened into the bore 17.

In all of the constructions, the tool can apply downward pressure, upward pull or turning movement to the limb portion. In the tool of FIG. 5, a second laterally projecting limb 20 is provided, this assisting manipulation on insertion. The tool rods can be of various shapes, i.e. have angled cranked or like lower ends with or without a laterally projecting limb to assist manipulation.

Referring now to FIG. 6, the operative end of a tongs like dislocator tool is shown, comprising two arms pivoted together at 21, one arm having an end part 22 to engage in the hole of the limb portion shown in FIG. 1 or 2 and the other arm having an end part 23 to engage the cup C. The cup C as illustrated has a plurality of projections 24, and a circumferential lipped border flange 25, under which the extremity (preferably with a projection as shown) can engage. The arms can be pivoted relatively to open out the end parts 22, 23 so to dislocate the joint. A tongs like tool also could be provided for use with the limb portion of FIG. 4, combined with a cup.

I claim:

1. An artificial hip joint comprising in combination a cup-like socket portion and a ball engaging in said socket portion, a limb engaging stub depending from said ball, a waisted portion below said ball, said waisted portion having a bore of non-circular cross-section extending therethrough, a flange below said waisted portion from which flange said stub depends, and a tool including a limb end portion non-rotatably engaging in said bore to facilitate manipulation of said hip joint during introduction and extraction thereof.

2. In combination, a hip joint as claimed in claim 1, and said tool being an introducer/extractor tool having a limb end portion for non-rotatable engagement in said bore.

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3. The combination as claimed in claim 2, comprising means for retaining said end portion in said bore.

4. An artificial hip joint comprising in combination a cup-like socket portion and a ball engaging in said socket portion, a limb engaging stub depending from said ball, a waisted portion below said ball and having

a bore therethrough, a flange below said waisted portion from which flange said stub depends, a tongs-like dislocator tool including a pair of arms, the end of one of said arms engaging in said bore and the end of the other of said arms engaging said flange.

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