

[54] HIP-JOINT OPERATIONS

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128/92 F, 92 G, 305

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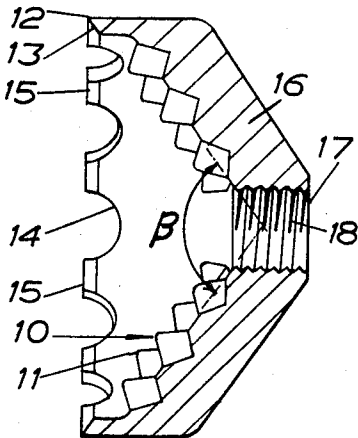
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[57] ABSTRACT

A method for re-attaching the great trochanter to the femur in which the faces to be joined are shaped respectively by matching male and female reamers so that one fits into the other to create an interlocking action. Suitable male and female reamers, preferably of conical or frusto-conical form are described. together with holders for the reamers.

5 Claims, 6 Drawing Figures



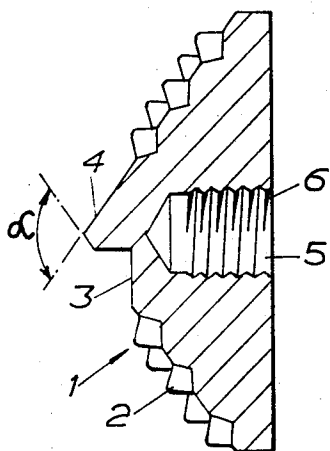


FIG. 1

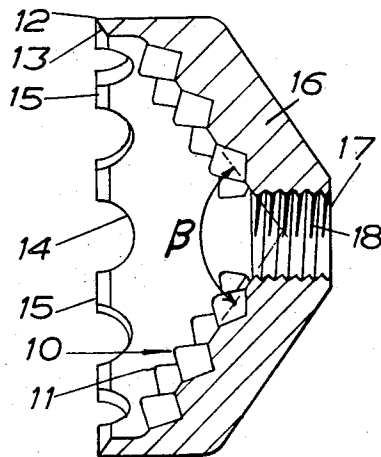


FIG. 3

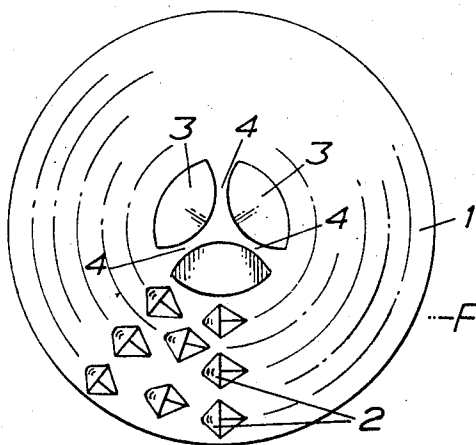


FIG. 2

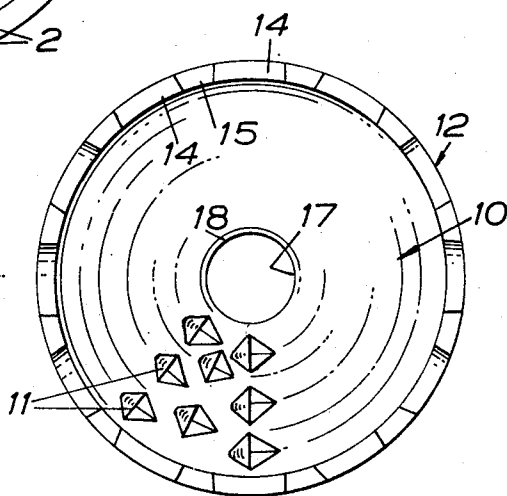


FIG. 4

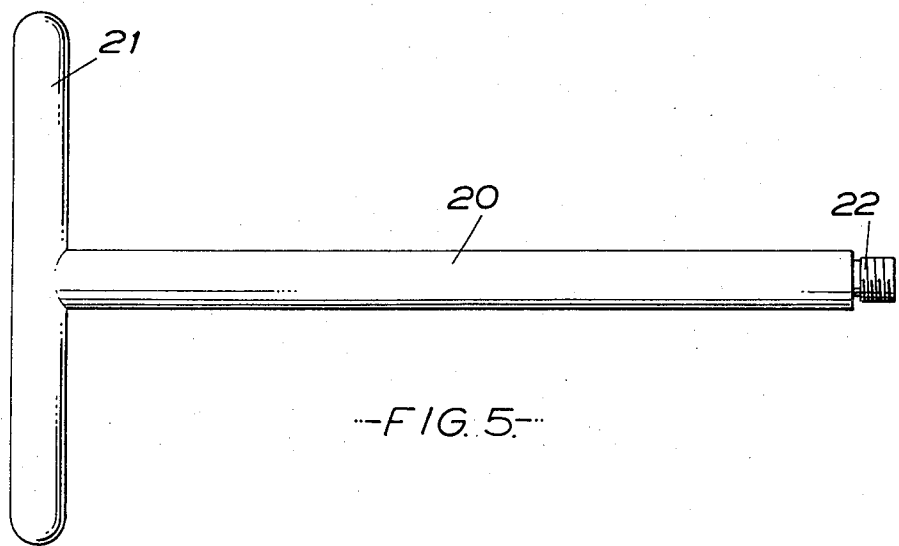


FIG. 5

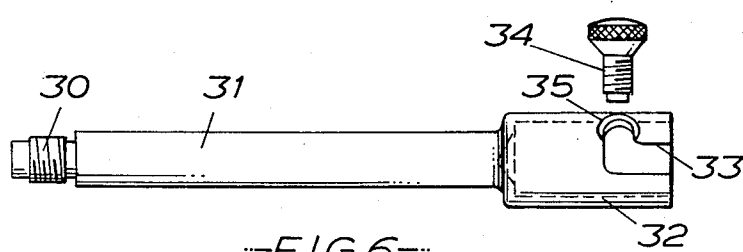


FIG. 6

HIP-JOINT OPERATIONS

This invention relates to techniques of hip-joint surgery, and to apparatus for use in such techniques.

A well-known procedure in the surgery of the hip-joint, used to gain access to the interior of this joint, is to cut the great trochanter away from the bone of the femur, elevate it together with its attached muscles, and thereafter proceed with the operation inside the joint. At the end of the operation the detached trochanter has to be re-attached to the bone, preferably in a position slightly more lateral to its original site.

The known method of re-attachment involves fixing together two flat surfaces of contact by mechanical fixing means such as screws, nails, staples or wire in various forms, and such methods are a source of great dissatisfaction in hip-joint surgery. There is a strong tendency for the trochanter to become detached, since this can rotate on the flat surface of the femur and so strain the mechanical fixing means, and for a fibrous union to occur between the trochanter and the femur.

From a first aspect the invention comprises a method of re-attaching the great trochanter to the femur in which the faces to be joined are shaped respectively by matching male and female reamers so that one fits into the other to create an interlocking action.

From another aspect, the invention provides apparatus for use in hip-joint surgery, the apparatus comprising a pair of reamers, one having a male working surface and the other a female working surface, the surfaces of the reamers matching so that reamed surfaces produced by the reamers will be a close fit one within the other.

In use, preferably the female reamer is used to fashion a male surface on the femur, and the male reamer is used to fashion a female surface on the detached trochanter. Thus, when the parts are reunited a spigot will enter a socket to give an improved mechanical engagement. This interlocking of the bones is considered to protect the mechanical means fixing the bones together, both from strain and from cutting out of the bone. Furthermore, the reamed surfaces provide a much larger contact area between raw bone than is available with previous methods where the surfaces tend to touch only at three or four points.

Preferably each working surface is generally conical or frusto-conical, and is provided with teeth over a substantial part of the surface. In the reamer with the female working surface the conical or frusto-conical surface conveniently ends in a rim, chamfered to the same angle as the working surface and provided with a number of cutting teeth formed axially of the conical or frusto-conical surface.

The cone angle is preferably obtuse. However, the angle may be a right angle or an acute angle. Forms other than conical or frusto-conical may be used, and the arrangement of teeth on the working surfaces may take any one of a number of forms.

The reamers may be designed to be mounted in a manually turnable T-shaped handle, or to be mounted on a light weight brace.

An embodiment of male and female reamers according to the invention will now be described in more detail, by way of example only, with reference to the accompanying drawings in which:

FIGS. 1 and 2 are a cross section and end elevation respectively of a male reamer;

FIGS. 3 and 4 are a cross section and end elevation respectively of a female reamer;

FIG. 5 shows a handle for the reamers to a reduced scale; and

FIG. 6 shows alternative mounting means, again to a reduced scale.

As shown in FIGS. 1 and 2 a male reamer has a generally

conical working surface 1 formed with a plurality of rasp teeth 2 over the full face of the cone. Towards the apex of the cone three flutes 3 are cut transverse to the axis of the cone, adjacent flutes being separated by a cutting edge 4. The reamer has an axial hole 5 formed at one end thereof, and provided with an internal screw thread 6. The cone angle, that is the angle α , is 110° .

FIGS. 3 and 4 show a female reamer for use in conjunction with the male reamer of FIGS. 1 and 2. This female reamer has a generally conical working surface 10, again having a cone angle β of 110° . Rasp teeth 11 are formed over the full face of the cone, and are similar in form to the teeth on the male reamer. The surface 10 ends in a rim 12, chamfered at 13 to the same angle as the surface 10, and the rim is interrupted at intervals by grooves 14 to form upstanding teeth 15 extending axially of the conical surface. The base 16 of the reamer is formed with an axial bore 17, provided with an internal screw thread 18.

The cone angles and tooth arrangement on the male and female reamers are similar, and accordingly when one is used on the trochanter and one on the femur the bones will be shaped to matching socket and spigot formations which will be a close fit one within the other.

It will be appreciated that the cone angle may be varied as desired, as may the formation and arrangement of the teeth. The reamers need not be conical, but may be cylindrical or have matching curved working surfaces. The working surfaces should be substantially a surface of revolution about the axis, but deformed by the teeth. The teeth are preferably made by actual working of the conical surface, but if desired a toothed lining material may be secured to a smooth base surface.

FIG. 5 shows a handle with which either reamer may be associated. The handle has a stem 20 terminating at one end in a cross piece 21 and at the other in an externally screw threaded part 22 which can mate with the threads 6 or 18 of either the male or female reamer. The reamer may thus be rotated to cut the bone by manual rotation of the cross piece 21 about the axis of the stem 20.

Alternatively either reamer may be used in conjunction with a light weight brace, when a holder as shown in FIG. 6 may be employed. This holder has an end 30 threaded to engage the threads 6 or 18 of either the male or female reamer. At the other end of a stem 31 is a sleeve 32 formed with a slot 33. The sleeve may fit on to the end of a light weight brace and be locked in position by a locking screw 34 threadably engaging the end 35 of the slot 33.

It will be appreciated that other forms of holder for the reamers may be designed, and the reamers themselves may have mounting means other than the threaded holes described.

What I claim is:

1. A method of re-attaching the great trochanter to the femur comprising the steps of shaping a face of said great trochanter and a face of said femur one by a male reamer and the other by a female reamer to form complementary socket and spigot formations; placing said faces one on the other so that said socket and spigot formations interlock; and mechanically securing said great trochanter and femur in their relative positions with said formations interlocked.

2. A method as claimed in claim 1 wherein said socket and spigot formations are of conical form.

3. A method as claimed in claim 1 wherein said socket and spigot formations are of frusto-conical form.

4. A method as claimed in claim 1 wherein said spigot formation is formed on said femur and said socket formation is formed on said great trochanter.

5. A method as claimed in claim 2 wherein said cone is of obtuse angle.

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