

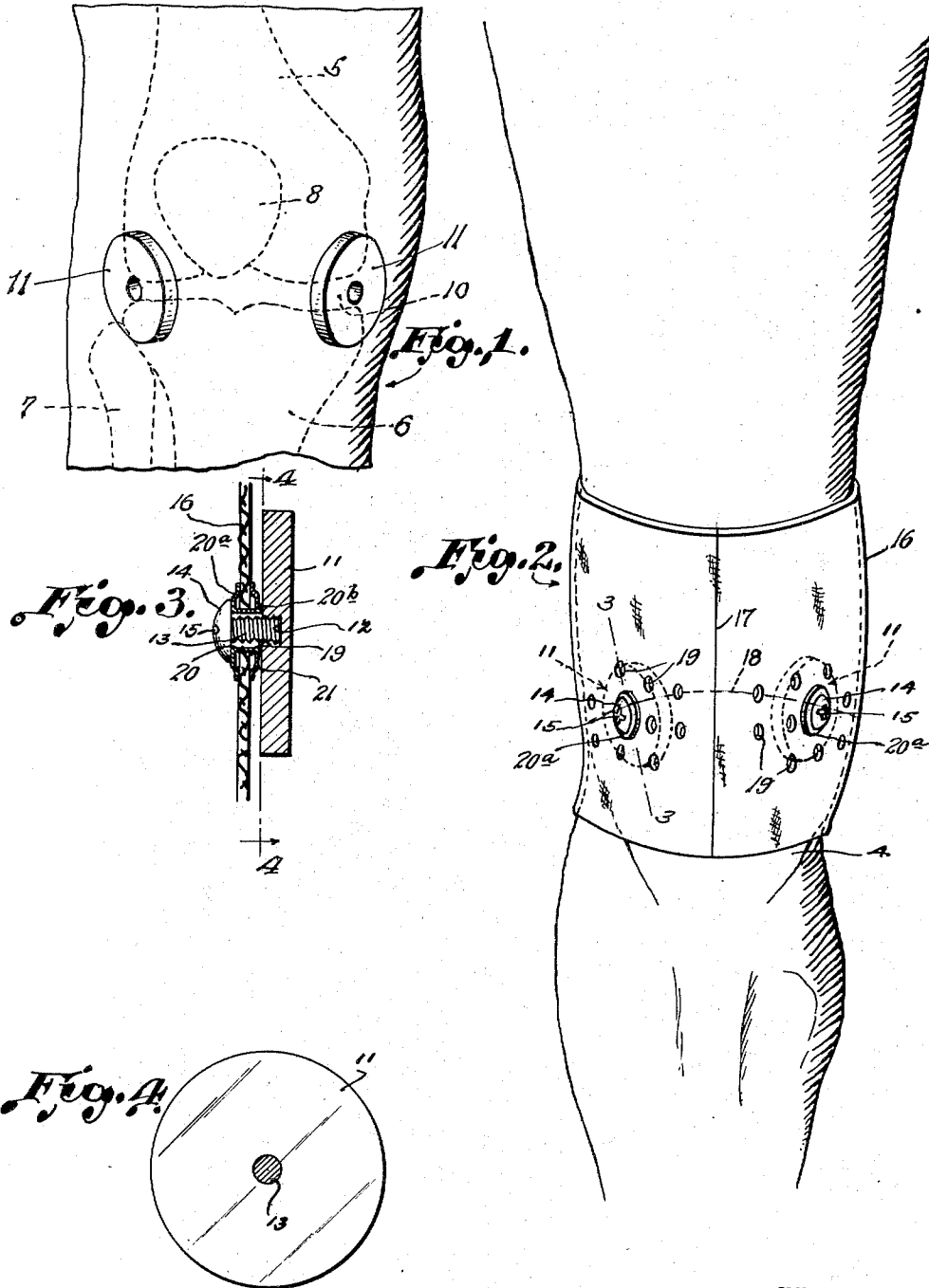
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MEANS FOR TREATING CARTILAGE INJURIES

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MEANS FOR TREATING CARTILAGE INJURIES

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My invention relates to means for treating cartilage injuries, with particular reference to human beings although not necessarily restricted thereto.

Briefly and generally stated, the invention in its broadest aspects aims to provide means for stimulating and restoring to normal strained or otherwise injured cartilages, as for instance, those in the region of a human knee joint.

More specifically, the invention in its presently preferred form contemplates the means set forth in the preceding paragraph which incorporates an elastic bandage as one of the "means" elements and a preferably freely rotatable bandage-carried massage element which latter is caused by the bandage to partake of partial rotative massaging movement when the knee joint is flexed.

Additionally, it is an object of the invention to provide means in association with a preferably elastic knee bandage for preventing the eruption of the cartilages of the knee while at the same time effecting a stimulation of same and the proximate strained muscles and ligaments and permitting substantially free use of the joint.

Various other objects and advantages of the invention will become apparent as the description proceeds, reference being had to the accompanying drawing illustrating my treatment and means in its now preferred form. It should be understood, however, that the invention is susceptible of other expression within the spirit and scope of the subject matter claimed hereinafter.

In the drawing, wherein the same reference characters have been used to designate the same parts throughout the several views—

Fig. 1 is a front elevational view illustrating a human knee joint;

Fig. 2 illustrates the application of my novel bandage and massage means to a human knee joint in the carrying out of my treatment for restoring injured ligaments to normal;

Fig. 3 is a fragmentary cross sectional view through the bandage taken on the line 3—3 of Fig. 2; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3 and illustrating, in plan, one of the novel rotative massage discs which are employed.

Referring specifically to the drawing and turning to Fig. 1, numeral 5 designates the femur bone of a human knee while reference characters 6 and 7 designate respectively the tibia and fibula bones. The patella, or knee cap, is de-

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noted by 8. At the outer side (left, as seen in Fig. 1) of the joint 10 formed by the femur and tibia bones is located the lateral semilunar cartilage, while at the inner side of said joint (right, as seen in Fig. 1) is the medial semilunar cartilage.

Fig. 1 illustrates two duplicate disc elements 11, one (at left in the figure) centered over the lateral semilunar cartilage and the other over the medial semilunar cartilage (at the right in the figure). The discs 11 will preferably be approximately two inches in diameter and one-fourth of an inch thick and are impressed against the articulation or joint 10 between the femur 5 and the tibia 6. The location of the discs 11 is scientifically determined as that which will be most effective in preventing the eruption of lateral and medial semilunar cartilages referred to or in protecting and stimulating said cartilages if they have been erupted and restored.

In practice, the discs 11 will be maintained pressed against the joint 10, as indicated, and they will be given rotative movement about their centers so as to massage the cartilages.

In the preferred example of the invention the discs 11 are rotatably secured to the elastic bandage 16 and positioned at the inner surface thereof, as indicated in dotted lines in Fig. 2.

In carrying out the disc-mounting phase of the invention it will be noted upon reference to Fig. 3 that each disc 11 has a concentric outer surface recess 12 which is tapped to receive the shank 13 of a screw having the enlarged head 14 which is provided with the screwdriver-receiving kerf 15, as indicated. The bandage 16 will preferably have at its front a vertically extending center-defining line 17. Also, at the back of the bandage there will be a horizontally extending line 18 across at least its rear half. This horizontal line 18 will, when the bandage is applied, be in line with the line of the posterior reflex of the knee. Or in other words, said line 18 should be in line with the crease at the distal end of the femur bone 5 when the knee is bent.

The vertical line 17 at the front of the bandage 16 should be centered about midway the sides of the knee cap 8 when the bandage is applied.

The bandage 16 may and preferably does have a plurality of "buttonhole stitched" holes 19 in the general region of the cartilages at opposite sides of the joint 10, as indicated in Fig. 2, for selectively receiving disc shank sleeve bearing 20. These holes 19 will be substantially oversized with respect to the diameter of the screw shanks 13. The reason for this is to admit of insertion of the

bearing sleeves 20 which are oversized with respect to the diameters of screw shanks 13 so as to admit of free rotation of same with their discs 11.

The screw shanks 13 extend through the short sleeve bearings 20 whose outer ends are flanged outwardly in disc form as at 20a to provide a bearing surface for the overlying underhead portion of the screw heads 14. Surrounding each bearing sleeve portion 20 and bearing against the inner surface of the bandage 16 is a washer 21 having a central hole through which bearing sleeve 20 is inserted. The inner end of the bearing sleeve is laterally flanged as at 20b to retain washer 21 in place.

When the discs 11 have been properly located by the physician or trainer the lines 17, 18 on the bandage 16 enable the user to make sure that the discs 11 are engaged at the proper points.

In practice, when the screw shank 13 has been tightened into the concentric disc hole 12, the screwhead 14 will have a free rotative bearing engagement with the proximate surface of the sleeve flange 20a. In other words, when the screw is tightened to the disc the distance between the disc 11 and the inner surface of the screwhead 15 will be slightly greater than the distance between the outer surface of the flanged sleeve portion 20b and the outer surface of the screwhead bearing flange 20a of said sleeve 20.

When the bandage is in place, as indicated in Fig. 2, it will be apparent that articulation of the knee joint will cause the elastic bandage to exert presure against the discs at circumferentially spaced points so as to cause the discs to partake of some rotative movement, in one direction or the other, as the knee joint is articulated. This results in a massaging of the cartilages in that region. Such action greatly assists in restoring the cartilages to normal and also admits of substantially free use of the knee.

In other words, when the bandage with associated discs 11 is in position, as shown in Fig. 2, articulation of the joint sets up a constant traction of each disc 11 within its own area and the bandage 16 resists lateral forces tending to displace the discs from their original locations in reference to the joint 15. Thus, the device is for use in the treatment of the semilunar cartilage to prevent the accidental extrusion of this cartilage between the femur and the tibia bones and the "pinching" of the same between these two bones.

When there is an extrusion of the semilunar cartilage, it has been found that pressure at the right time and the right place can prevent this

extrusion and restore the cartilage to its original place. Therefore, this pressure is supplied as by the discs 11 which are placed oppositely and laterally on the rubber bandage 16 where the cartilage extrusion normally occurs. The ordinary pressure of the elastic band 16 is magnified when the knee is bent, and at the same time the discs partially rotate with the hinge action of the joint against which the discs are pressed. The elastic band moves against the motion of the knee joint and the discs partially rotate with the knee action, and at the same time the elastic band is stretched to cause increased pressure of the discs, the discs thus acting to press the semilunar cartilage, which has a tendency to pass out laterally between the femur and tibia, to its proper place to rejoin the whole cartilage in its proper place. Therefore, the device functions in a manner to restore displaced cartilage.

Having thus described my invention, what I claim is:

1. Means for assisting in restoring injured knee joint cartilages to normal, which comprises an elastic joint-encompassing bandage and rotatable discs carried by the bandage at the inner surface thereof and cartilage, said bandage causing each disc to partake of a partially rotative and pressure action when the knee joint is articulated.

2. The combination set forth in claim 1, and a bandage-carried pivot secured to each disc.

3. The combination set forth in claim 1, and a bandage-carried pivot secured to each disc, and the bandage having a pivot-receiving hole for reception of the disc pivot, and a bearing mounted in the hole of the bandage for anti-friction reception of the disc pivot.

4. Means for assisting in restoring injured knee joint cartilages to normal, comprising a joint-encompassing bandage and rotatable freely-mounted discs carried by the bandage at the inner surface thereof and compressible against the knee joint.

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