

Nov. 4, 1958

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2,858,827

ORTHOPAEDIC APPARATUS

Filed March 13, 1956

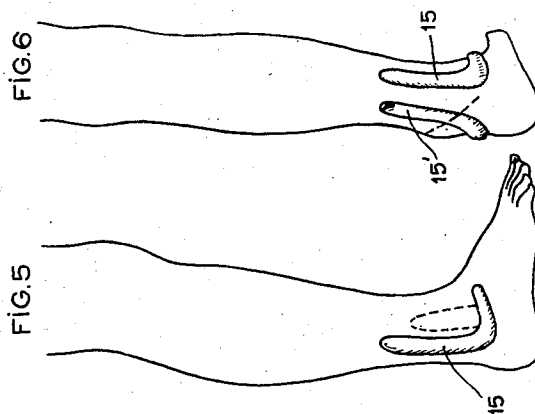
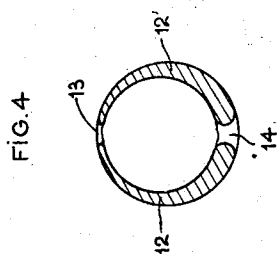
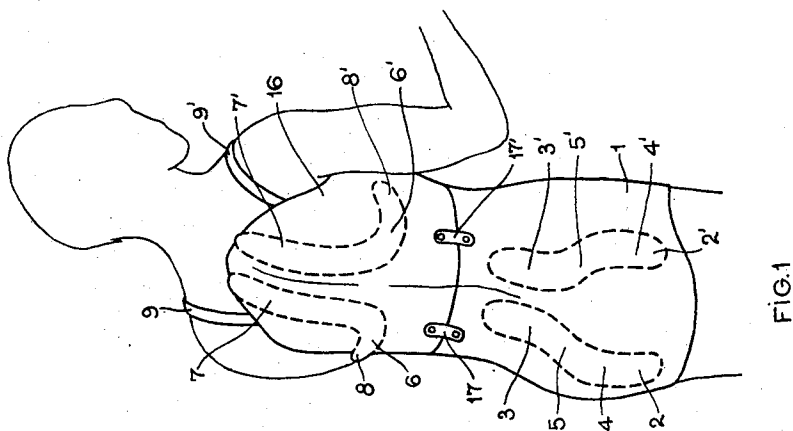
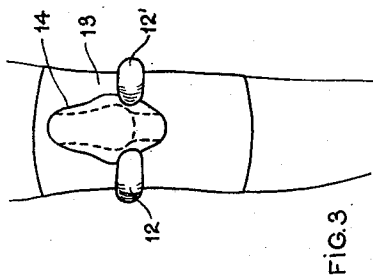
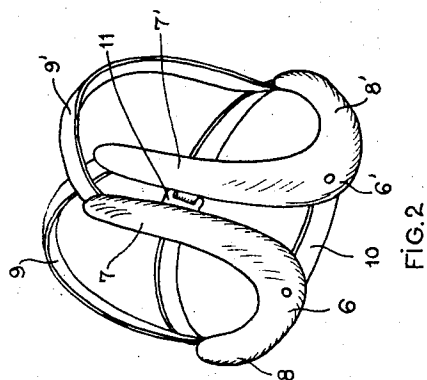


FIG. 6

FIG. 5



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## ORTHOPAEDIC APPARATUS

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Application March 13, 1956, Serial No. 571,243

Claims priority, application France March 25, 1955

3 Claims. (Cl. 128—78)

The present invention relates to an improvement in or relating to orthopedic apparatus intended to keep some parts of the body in a position preventing a pathological displacement of the osseous or muscular parts concerned. In known orthopedic apparatus, either of the type used in the case of a lesion or a deformation of the vertebral column, or the type for the setting of a fracture in the region of a joint, and in similar apparatus, one aims at obtaining the desired result by completely securing against motion the parts of the body concerned, thus giving rise not only to a great constraint but also, particularly in the case of a fracture, to an ankylosis of the joint entailing later on a long readaptation. In addition, as in practice it is quite impossible to neutralize entirely all muscular play, very small displacements are always to be feared, and if these displacements allowed are of a pathological nature, the apparatus will lose the greater part of its efficiency.

The present invention relates to an improvement in the orthopedic apparatus which obviates the drawbacks above mentioned and effectively opposes pathological displacements while allowing the natural movements of the joints concerned.

The apparatus according to the invention is characterized in that it comprises a set of flexible compressive splints placed in pairs on both sides of the articular axis or of the articular plane, these splints having a shape and a size allowing them to get out of shape in planes parallel to the articular axis or the articular plane, while exerting unceasingly the compression upon the organs concerned and keeping them from becoming deformed transversally so as to hinder the pathological displacements of the osseous or muscular parts concerned.

By way of example, several forms of embodiment of the invention are described hereafter and illustrated in the annexed drawing.

Figure 1 shows the application of the invention to the apparatus intended to maintain the vertebral column in the lumbar region and in the dorsal region, respectively.

Figure 2 is a perspective view of the dorsal apparatus, alone.

Figures 3 and 4 illustrate, in front view and in horizontal section, respectively, a knee-piece according to the invention.

Figures 5 and 6 illustrate, in side view and in back view, respectively, an apparatus intended for the reducing of a fracture of the shin-bone at the metatarsal joint.

Figure 1 illustrates two applications of the invention to the apparatus intended to cure the diseases of the vertebral column, in the lumbar region or in the dorsal region.

The apparatus in use for the present for the lumbar region, in case of scoliosis, discal hernia, sciatica, are constituted by steel boned devices, or by corsets made of plaster or of a plastic material intended to immobilize thoroughly the trunk in the region of the loins. These apparatus are rigid and not fit to follow any movement of the body; and if they are given a play sufficient to allow

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some bending or twisting movements, the thrust which they are normally intended to apply upon the osseous or muscular parts to be immobilized, will disappear during these movements.

5 The apparatus according to the invention is constituted by a belt 1, made of an elastic fabric upon which are fixed two compressive splints 2, 2', constituted by flexible elongated cushions, preferably made of a microcellular rubber and arranged symmetrically on both sides of the vertebral column. Each of these cushions includes an upper part 3, as well as a lower part 4 outwardly offset and connected with the upper part by an oblique portion 5. The upper parts 3, 3' of the two cushions are applied firmly on both sides of the vertebral apophysis while the parted arms 4, 4' maintain the gluteal muscles and the two branches of the corresponding sciatic nerves. The thickness, sectional shape, and flexibility of the elongated cushions are chosen so as to allow them to bend with a small twisting in a direction parallel to the articular plane of the vertebral column (that is to say to the median vertical plane containing this column) but preventing any noticeable distortion in the lateral direction. The result is that, at the bending or twisting movement of the body in the lumbar region, the two cushions will follow the body, continuously apply their compressive thrust and permanently oppose with their upper parts 3, 3', the lateral displacements of the intervertebral discs.

The apparatus designed for the dorsal region is based upon the same principle. It includes two symmetrical elongated cushions, having roughly the shape of set-squares, 6, 6'. Vertical branches 7, 7' of these cushions, are applied on both sides of the vertebral column level with the shoulder blades while the horizontal branches 8, 8' extend under the arms, at the root of the big dorsal muscle. Due to the thrust exerted by the vertical branches 7, 7', all the muscular dorsal bundle (latissimus dorsi, small round muscle, intraspineous, trapezius) is normally applied upon the shoulder-blades.

As shown in Figures 1 and 2, the two dorsal elongated cushions 6, 6', are held in position by straps 9, 9', crossed in the back and forming braces, each of these straps 9, 9' connecting the upper end of one of said cushions with the lower end of the other cushion. The cushions are, in addition, fixed upon a horizontal strap 10 which constitutes a belt with a frontal tightening buckle, 11.

The dorsal cushions can also be disposed in sheaths of fabric stitched in a bodice or a bust-supporter 16, buttoned up by means of elastic straps 17, 17' on the lumbar belt 1. Of course, it is also possible to reinforce the belt 1 and the bodice 16 with a few flexible steels arranged on both sides of the vertebral column.

If the apparatus is a knee-piece, as shown in Figures 3 and 4, it includes two side cushions 12, 12', arranged horizontally on both sides of the joint, level with the tibial plate, to prevent a dislocation of the meniscus, these cushions being arranged in a sheath 13 made of a strong elastic fabric and having a wide frontal opening for the play of the patella.

The Figures 5, 6 illustrate the invention as applied to a fracture (shown in broken line) of the shin bone at the metatarsal joint. The apparatus includes also two elongated cushions, in the shape of set-squares, 15, 15', which are applied, on the one hand upon the shin-bone and extend up to the tarsal bones and, on the other hand, upon the fibula, the whole being held in position by a compressive bandage. Thereby the fracture is correctly held in position, the movements of the multiple metatarsal joints being nevertheless allowed. A nearly identical apparatus can be used in the case of a fracture of the wrist, particularly of the radius at the carpal joint.

The cushions for the ankles shown in Figures 5 and 6 can also be arranged in shoes, particularly in ski-boots, so

as to limit the risk of the sprains and of the fractures.

Of course, the embodiments above described have been given only by way of non limiting examples; they can be multiplied and the forms of embodiment can be modified without departing from the scope of the invention.

What I claim is:

1. Orthopedic apparatus for patients affected with a lesion of the vertebral column in the dorsal region including a bodice made of a fabric and two cushions made of a supple microcellular material fixed inwardly upon said bodies and adapted to be disposed substantially symmetrically on both sides of the vertebral column of a patient, said cushions having a curved shape and adapted to pass around the shoulder blades of a patient along their inner lower edges.

2. Orthopedic apparatus for patients affected with a lesion of the vertebral column in the lumbar region including an elastic belt, two elongated cushions made of a supple microcellular material fixed inwardly upon said belt, said cushions adapted to be substantially symmetrically disposed on both sides of the vertebral column of a patient, each cushion comprising two sections adapted to be disposed substantially parallel to said column, said sections being laterally offset in relation to each other and being interconnected by an oblique cushion section, the upper sections of the two cushions being near to one another and adapted to be applied on both sides of the vertebral apophyses while the lower sections are spaced apart and adapted to be applied upon the gluteal muscles.

3. Orthopedic apparatus for lesions of the vertebral column including in the lumbar region an elastic belt and two elongated cushions made of a supple microcellular

material inwardly fixed upon said belt, said cushions adapted to be symmetrically disposed on both sides of the vertebral column, each of said cushions comprising two sections adapted to be disposed parallel to said column, said two sections of each cushion being offset in relation to one another and being interconnected by an oblique section, the upper sections of said two cushions being relatively near to one another and adapted to be closely applied on both sides of the vertebral apophyses while the lower sections of said two cushions are farther apart from one another than said upper sections and adapted to be applied upon the gluteal muscles and, in the dorsal region, a bodice of fabric provided with means to fix it removably upon said belt, two further elongated cushions, made of a supple microcellular material, fixed inwardly upon said bodice and adapted to be substantially symmetrically disposed on both sides of the vertebral column, said two further cushions having a curved shape and adapted to pass around the shoulder-blades along their inner edge and their lower edge.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|    |           |         |               |
|----|-----------|---------|---------------|
| 25 | 2,641,761 | Schultz | June 16, 1953 |
|    | 2,646,797 | Scholl  | July 28, 1953 |
|    | 2,730,096 | Pease   | Jan. 10, 1956 |

##### FOREIGN PATENTS

|    |         |         |               |
|----|---------|---------|---------------|
| 30 | 466,232 | France  | Feb. 26, 1914 |
|    | 840,438 | France  | Jan. 16, 1939 |
|    | 874,059 | Germany | Apr. 20, 1953 |