Sept. 27, 1966 E. L. JEWETT 3,274,996

SURGICAL BRACE

Filed Sept. 1, 1961

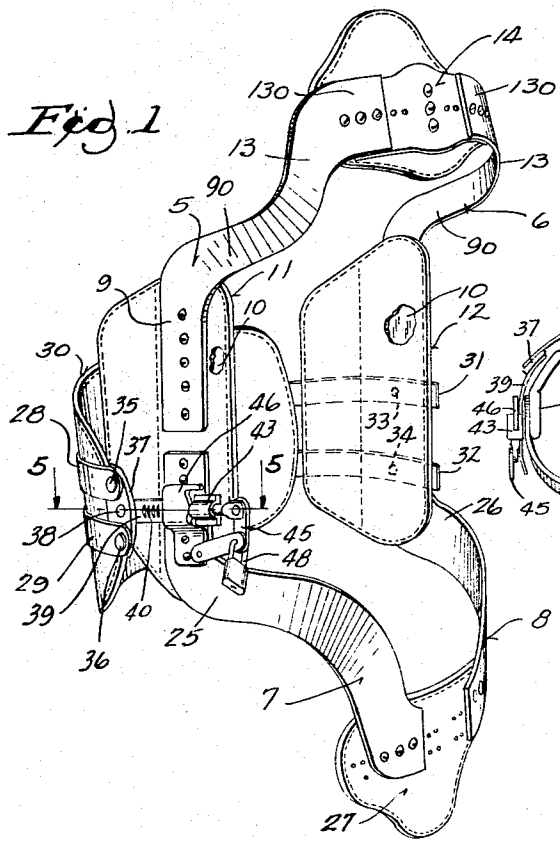


Fig. 1

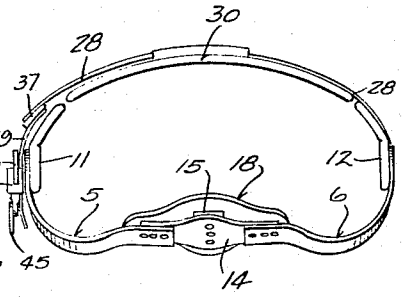


Fig. 2

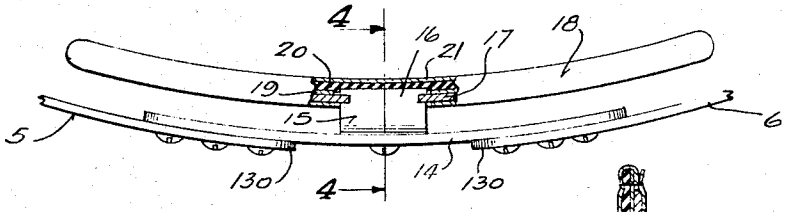


Fig. 3

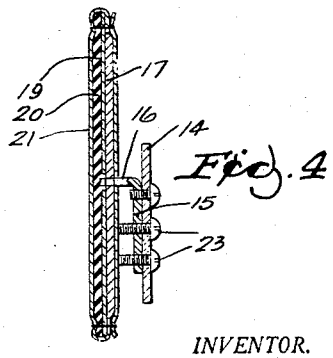


Fig. 4

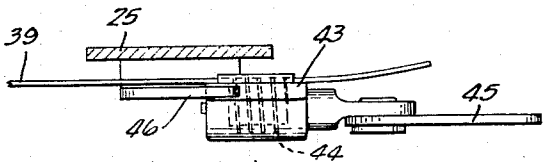


Fig. 5

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SURGICAL BRACE

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4 Claims. (Cl. 128—78)

This invention relates to a surgical brace embodying improvements upon the structure disclosed in my United States Patent No. 2,582,930, dated January 15, 1952.

The type of brace disclosed provides three points of pressure in hyperextension cases and permits patients to be ambulatory, whereas such patients were at one time confined in casts. The particular hyperextension brace of the present invention features sternal pad bars of peculiar form which in curving forwardly, extend almost horizontally forwardly from the upper ends of the lateral torso pads, thence curving almost vertically upwardly to the level of the sternal pad. Thus the upper portions of the sternal pad bars are in substantial parallelism. The sternal pad is mounted on a frame member adjustably connecting these bars and is desirably tiltable to be self-adjusting in its engagement with the patient's chest.

The lumbar pad is carried on two straps which encircle the patient's back and are adjustably fixed to the metal frame members at each side of the patient. In order that a single adjustment may take care of both of these straps, an equalizing bar is pivoted to the two straps and connected with a single adjusting means for subjecting these straps to tension. The adjusting device comprises a sleeve through which the end of the adjustable strap extends, such end having teeth with which a worm journaled within the sleeve is in mesh. The sleeve is in detachable engagement with a hooked bracket on the frame of the brace so that the brace can readily be released and reconnected without interference with the preset adjustment.

In the drawings:

FIG. 1 is a view in perspective of a brace embodying the invention.

FIG. 2 is a plan view on a reduced scale of the brace shown in FIG. 1.

FIG. 3 is a fragmentary detail view of the sternal pad on a greatly enlarged scale, portions being broken away in horizontal section.

FIG. 4 is a detail view taken in section on the line 4—4 of FIG. 3.

FIG. 5 is an enlarged fragmentary detail view taken in section on the line 5—5 of FIG. 1.

The brace frame includes the sternal bars **5** and **6**, the pubic bars **7** and **8** and connecting parts. The sternal bars are allochiral counterparts but, in particular detail, differ from any previously known. Each has an upright portion disposed at the side of the patient's torso and adjustably connected to a re-enforcing bar **10** within the torso side pad **11** or **12**, as the case may be. From the upright portion **9** the frame member extends almost horizontally forwardly and around the thorax of the patient at **90** and thence it extends almost vertically at **13** and again extends horizontally at its terminal portion **130**. Like reference characters are applied to the two frame elements **5** and **6**.

The terminal portions of these frame elements are adjustably connected with each other by a transverse plate member at **14** to which is screwed a bracket **15** having a rearwardly projecting finger **16** extending through, and interlocked with, a metal re-enforcing plate **17** in the sternal pad **18**. Behind the plate **17** is a carrier-ply **19** which carries padding material **20** of sponge rubber or the like, the re-enforcing plate **17** and plates **19** and **20** being enveloped in a jacket **21** which may conveniently be made of artificial leather or any appropriate material.

The entire sternal pad **18** is tiltable upon its mounting on the finger **16** of bracket **15**. Within required limits the pad is self-adjustable in view of manufacturing tolerances inherent in the type of interlock shown. It may be entirely self-adjusting in contact with the sternum of the patient, or some of the screws **23** which mount the bracket **16** may be extended as shown in FIG. 4 to abut the pad and thereby to prevent it from pivoting counterclockwise from the position in which it is shown in FIG. 4, while permitting it to pivot clockwise from the position illustrated in that view.

The frame bars **5** and **6** above described are connected through the re-enforcing plates **10** of the torso side pads **11** and **12** with the frame bars **25** and **26** which support the pubic pad **27**. Frame bars **25** and **26** are not essentially changed from prior practice. The sternal pad **18** and the pubic pad **27** provide the two forward pressure points between which lumbar pad pressure is applied from the rear.

The straps **28** and **29** which adjustably connect the lumbar pad **30** to the side members of the frame are desirably made of metal to be nonextensible in use. Their end portions **31** and **32** are adjustably connected with the left side pubic support bar **26** by screws **33** and **34** shown in dotted lines in FIG. 1. At the patient's right the ends of the straps **28** and **29** are pivotally connected by rivets **35** and **36** with an equalizing bar **37** pivoted at **38** to an adjusting strap **39** which has a series of teeth **40** of the type used in adjusting a hose clamp. The adjusting strap **39** extends through a sleeve **43** in which there is journaled a worm **44** whose teeth mesh with the teeth **40** of the strap for adjustment purposes. The worm **44** projects from the sleeve and has a handle **45** to facilitate its rotation within the sleeve.

The sleeve **43** thus adjustably fixed to strap **39** is detachably in thrust bearing contact with a hooked bracket **46** projecting laterally from the upper end of the pubic pad support bar **25** and behind which the strap **39** is releasably hooked. Means is provided at **48** for locking the handle **45** both to secure the worm **44** in adjusted position and to secure the sleeve **43** to the bracket. However, if the lock **48** is released, it is a simple matter to disengage the strap and sleeve **43** from the upwardly opening hook of bracket **46** to remove the brace without changing its adjustment.

With the brace in place, and adjusted to subject the lumbar region to pressure of pad **30**, a condition of hyperextension can readily be maintained without impeding the patient's freedom of movement. In this respect the peculiar offset in the sternal bars **5** and **6** of the frame of the brace is of great advantage, as is the floating sternal pad **18** and the easily detachable connection between a single adjusting strap **39** and the bracket **46**.

I claim:

1. A surgical brace comprising laterally spaced torso side pads; frame means connecting the side pads and comprising sternal bars and pubic bars connected with the side pads, a lumbar pad having strap means connecting it with said frame means, a sternal pad having means connecting it with the sternal bars and a pubic pad having means connecting it with the pubic bars; the sternal bars extending upwardly from the respective side pads and thence extending substantially directly forwardly and curvilinearly toward each other and thence extending upwardly in approximate parallelism to the level of connection with the sternal pad, the sternal pad comprising an internal plate having an opening and the means connecting it with the sternal bars including a finger extending into said opening, the finger and plate having marginally notched portions in interlocked connection, the plate being self-adjustable with respect to the finger.

2. A brace according to claim **1** in which the means

for connecting the sternal pad with the sternal bars further includes a frame member attached to the respective sternal bars and from which said finger projects, said member having means for adjustably limiting tilting movement of the sternal pad upon said finger in one direction of tilt respecting said member.

3. A brace according to claim 1 in which the strap means comprises a pair of vertically spaced straps, an equalizer link pivotally connected with adjacent ends of the straps, an extension strap connected with the equalizer link and means adjustable on the extension strap for detachably and adjustably securing the extension strap to the frame means, said frame means being provided with an upwardly open hook and said strap having a terminal portion provided with screw threads on which said adjustable means is threaded, said portion being freely movable into and from said hook without changing the position of the adjustable means on the screw threads, said hook providing an abutment engaged by the adjustable means when the extension strap is disposed in the hook.

4. A surgical brace comprising laterally spaced torso side pads; frame means connecting the side pads and comprising sternal bars and pubic bars connected with the side pads, a lumbar pad having strap means connecting it with said frame means, a sternal pad having means connecting it with the sternal bars, and a pubic pad having means connecting it with the pubic bars; the sternal bars extending upwardly from the respective side pads and thence extending substantially directly forwardly and curvilinearly toward each other and thence extending upwardly to the level of connection with the sternal pad, the lumbar pad strap means being provided with threads and a sleeve adjustably threaded thereon, and the frame

means including a fitting having an upwardly open hook in which said last mentioned strap means engaged and from which it is freely disengageable, the hook having a surface abutted by said adjustable sleeve to limit rearward movement of the last mentioned strap means, whereby to hold the last mentioned strap means under tension for pressing the lumbar pad against the back of a patient.

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