United States Patent [19]

Fox

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[54] **SPINAL POSITION PATIENT RESTRAINT**

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[52] **U.S. Cl.** **269/328,** 128/134

[51] **Int. Cl.** **A61g 13/00**

[58] **Field of Search** ..... 5/317 R, 327 R, 338; 128/70, 133, 134; 269/104, 115, 116, 117, 54.4, 140, 156, 305, 322, 328

[56] **References Cited**

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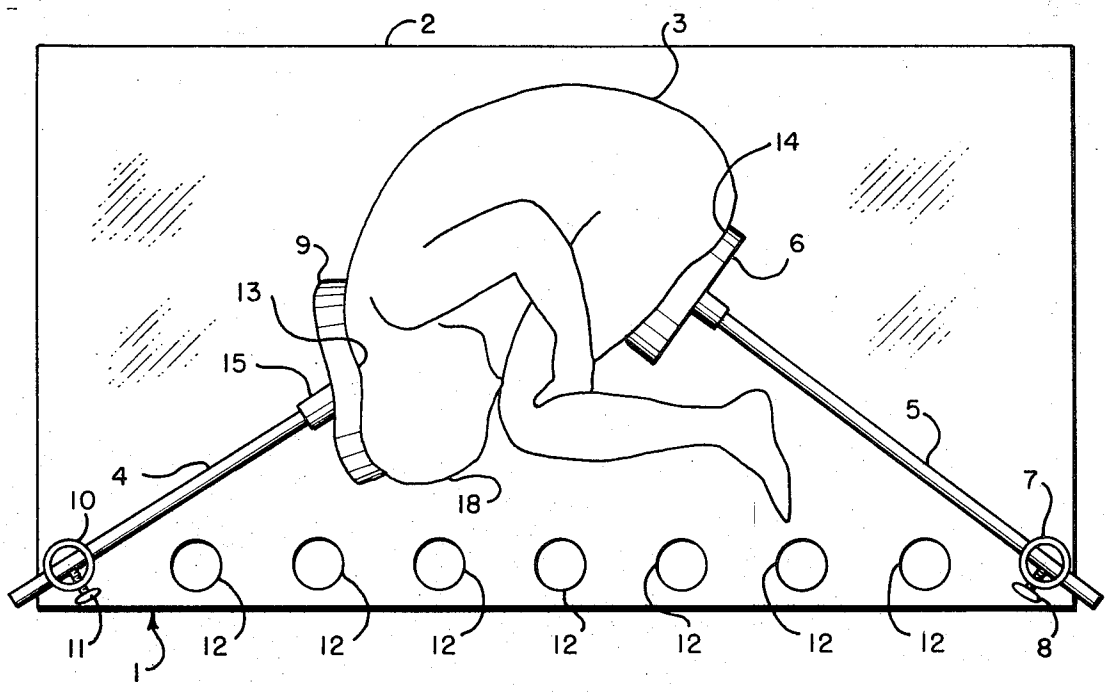
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Assistant Examiner—Mark S. Bicks
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[57] **ABSTRACT**

A medical restraint device whereby a patient lying on his side on a medical treatment table, in a curled position with bowed spine, is prevented from involuntarily or inadvertently kicking, straightening the spine, or otherwise making a movement potentially dangerous to the spine. A cervical-occipital pad and a posterior-thigh pad are provided to bear against these general anatomical portions of the patient. Each pad is individually mounted for vertical, horizontal, and pivotal adjustment so as to be capable of being brought to the correct position with respect to the patient. Selectively adjustable fixing or locking means are provided. Various mechanical expedients, including sliding, or telescoping, or threaded connections to carry out these functions are provided.

10 Claims, 4 Drawing Figures



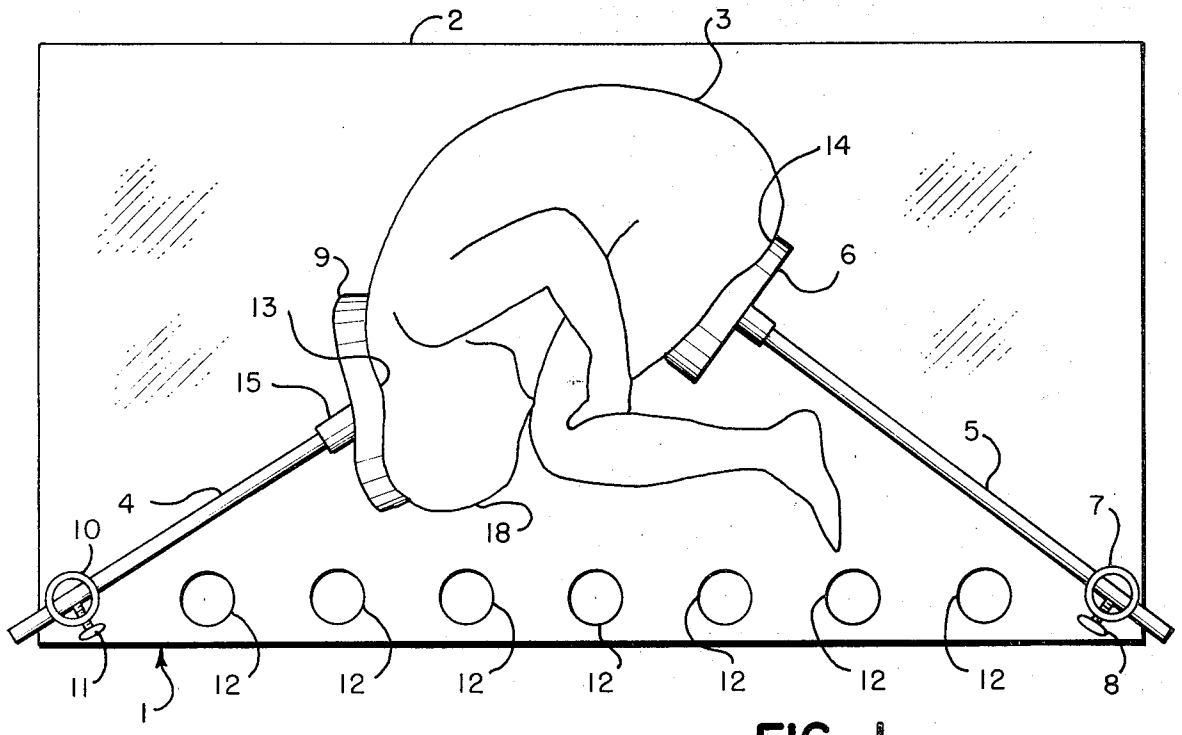


FIG. 1

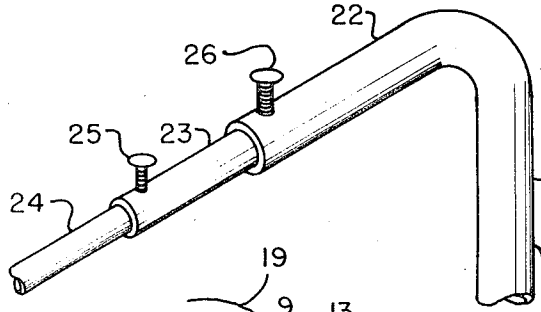


FIG. 3

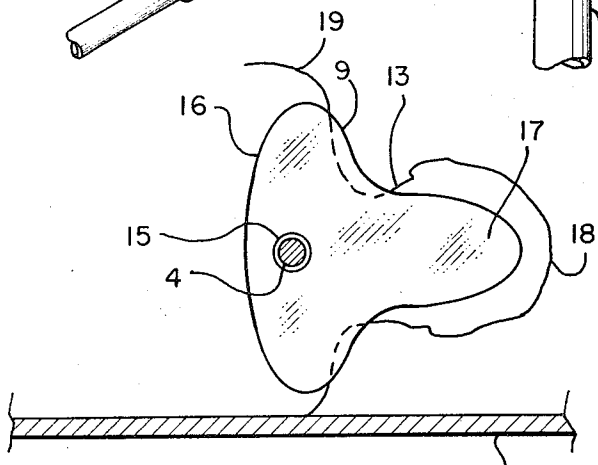


FIG. 2

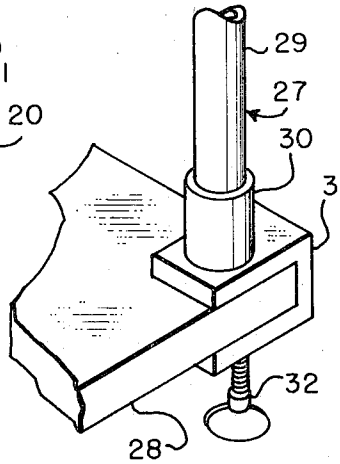


FIG. 4

SPINAL POSITION PATIENT RESTRAINT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the field of devices for providing certain degrees of restraint to medical patients, to facilitate treatment. More particularly, this invention relates to treatment or medical activity in relation to the spine of the patient in which the spine is presented to the attending doctor or other medical person in a curved or bowed position, with the patient's head toward his knees. This position is often assumed, with the patient lying on his side, when it is desired to medically penetrate the spinal column, as for performing a spinal tap. The invention particularly relates to a solution to the problems occassioned by the patient involuntarily or inadvertently kicking, thrashing, straightening his back or performing some other action.

2. Prior Art

Many devices are known in the prior art for exerting various kinds and degrees of restraint to medical patients. Certain types of prior art devices are straps or tie-downs, such as as shown in U.S. Pat. No. 3,063,447; 3,474,781; and 3,535,718. Various clamping devices, to restrain some portion of the patient's anatomy are disclosed for example in U.S. Pat. No. 2,446,470 and 3,672,364. Devices to support one or another portion of a patient are known, as in U.S. Pat. No. 3,512,189. The particular problem in medical treatment which the present invention solves is one that is long standing and serious.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a spinal position patient restraint.

Another object of the invention is to provide a means to prevent a patient, who is lying on his side on a medical treatment table, in a curled position with his back bowed, from accidentally or involuntarily straightening his back. It is sometimes known to happen, when performing a spinal tap, that the spinal cord, or perhaps some other nerve associated with the patient's spine, is inadvertently interfered with by the medical practitioner. This can cause an involuntary or reflex strong and uncontrollable muscle action on the part of the patient, taking the form of a violent kicking or a straightening out of the entire body. A particularly dangerous possibility that arises is that of the spinal tap instrument accidentally causing damage to the spinal nerve system during this reflex movement. It is primarily this problem that the present invention in intended to solve.

Briefly, the patient lies on a treatment table, on his side, in a curled position. A cervical-occipital pad is positioned in the general area of the patient's upper shoulders, neck, and lower head. Another independent pad is positioned in the area of the back of the patient's thighs and his lower buttocks. Each pad is independently adjustable and supported. Adjustable means is provided to maintain the pad at the proper height above the table, and adjustable means is provided to permit the pad to pivot around the base or bottom of a support. Additional justable means is provided to position the pad at a selected distance from the base or bottom of the support. Locking or fixing means are provided to hold at least some of the adjustments into

a fixed position. The spacing between the support bottoms is also selectively variable.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view showing a patient in position on a table restrained by a preferred embodiment of the brace,

FIG. 2 is a side elevation view partly in cross-section, taken looking toward patient's head along the length of the table,

FIG. 3 is a perspective view, fragmented, of the upper portion of an alternate embodiment of the brace, and

FIG. 4 is a perspective view, fragmented, of the bottom portion of another alternate embodiment of the brace.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment is best illustrated and understood in connection with FIG. 1. The brace and table combination is generally designated 1. A generally flat-surfaced medical treatment table 2 is provided. In general, this is of conventional construction and provides an elevated flat surface on which a patient may recline for treatment. In the preferred embodiment, as shown in FIG. 1, there is a modification of this initially conventional table, as is described in more detail below.

The patient, in the position on the table in which he is to be treated is generally designated 3. This is the position that a patient assumes in particular when work is going to be performed on his spine. As a particular example, the patient 3 assumes the illustrated position, lying on his side, and curled up as shown, when it is desired for medical reasons to perform a spinal tap. In this position, the spine is in the preferred exposed position most suitable for the medical activity. To avoid the possibility of the patient involuntarily violently straightening out, thrashing, kicking, or otherwise moving, with attendant danger to his own spinal integrity, the present restraint brace is provided.

As is best seen in FIG. 1, the function of the brace is to restrain the patient into the curled or more-or-less fetal position in which he is lying. With this restraint applied, an involuntary kick or involuntary straightening of the spine is prevented by the major brace elements. Speaking generally, it may be said that the major brace elements tend to keep the spine in a bowed position by exerting a force against the upper and lower ends of the spine if it should be attempted to straighten the spine.

Referring to FIG. 1, the left hand brace element comprises a horizontal pole 4. Considering that the patient is lying on his side on the table as shown, the approximate height of the horizontal pole 4 above the surface of table 2 is best indicated by reference to FIG. 2. That is, it is approximately as far from the table surface as is the patient's spine. The horizontal pole 4 is provided with a cervical-occipital pad 9. The description of the pad by this name is for convenience, but is not intended to necessarily specifically limit the anatomical portions of the patient against which it bears. The preferred extent and shape of the pad is best shown in FIGS. 1 and 2. It bears against the occiput, the cervix, and also against the upper portion of the shoulders. FIG. 2 shows how this pad generally broadens out in the shoul-

der area and narrows in the head and neck area, thus very roughly and generally following the dimensional outlines of the patient. The pad **9**, as well as the other pad **6**, is made of any suitable preferably resilient material, such as foamed rubber covered with plastic for example. The cervical-occipital pad **9** is attached to one end of the horizontal pole **4** by a collar **15** which fits around the end of pole **4**. The attachment means is not critical and is conventional. The horizontal pole **4**, and also, the horizontal pole **5**, are preferably hollow metal tubes, although it is obvious that they can be solid rods or made of any suitable structural material.

Near the end of the pole most remote from its point of attachment to the pad **9**, the pole **4** is adjustably affixed to a vertical support **10**. In the preferred embodiment, the vertical support **10** is a hollow metal tube, having a diameter larger then that of pole **4**, and having a pair of diametrically opposed holes therethrough near the top thereof through which pole **4** may slidably pass. A set screw **11** is provided through an appropriate threaded aperature in the vertical support **10**, so that horizontal pole **4** may be adjustably secured with respect to vertical support **10**. This structure is best illustrated at the lower left hand corner of FIG. **1**.

The vertical support **10** fits into and is supported by a socket provided in the upper surface of the table **2**. In the preferred embodiment, there are a plurality of such sockets **12** provided along the length of the table near one edge thereof. The socket into which vertical support **10** fits in FIG. **1** is hidden by the support, but the next adjacent socket **12** is illustrated. Each socket **12** may selectively receive a vertical support, and while holding it in an upright position, nevertheless permits it to rotate in the socket. For illustrative purposes, a complete line of sockets **12** is shown, but generally, the more central sockets would not be needed.

Referring to the righthand side of FIG. **1**, a set of brace elements identical in many respects to that previously described is provided. A horizontal pole **5** is provided, passing through the upper portion of a vertical support **7**, and is adjustably releasably secured thereto by means of a set screw **8**. This structure is identical to elements **4**, **10** and **11** previously described. Horizontal pole **5** is provided at one end thereof with a posterior-thigh pad **6** which is fastened to horizontal pole **5** in the same manner that pad **9** is fastened to pole **4**. The pad **6** is in its structure substantially similar to pad **9** as described. Its preferred planar outline is circular in the form shown, but may also advantageously be extended in the dimension running along the patient's thigh so as to form an oval outline. Its exact shape is not critical. The term posterior-thigh to describe the pad is adopted for convenience, but is not necessarily intended to limit the anatomical portions of the patient against which it bears. In case the patient kicks, it is desirable to provide some padding in those areas of the pole **5** or adjacent structure that his heels (or other part of his body) might be likely to hit, so as to avoid bruising.

The vertical support **7** also fits into a socket **12**, in the same manner as has been described above in connection with vertical support **10**. In FIG. **1**, vertical support **10** is shown in the extreme left socket and vertical support **7** is shown in the extreme right socket. This is a typical installation for a patient of a certain size. For a patient of a different size, one or both of the vertical supports **10** and **7** may be positioned in another one of the sockets **12** as illustrated. For example, this would likely be the case where the patient is smaller then the patient **3** as illustrated.

In use, the patient lies on the table and assumes the recommended position. Fundamentally, the patient holds himself in the position, and the restraint of the present invention is not primarily to force him into that position, but to prevent him from involuntarily or inadvertently springing out of it. After the patient has assumed this position, the cervical-occipital pad **9** is positioned by placing the vertical support **10** in the appropriate socket **12**, adjusting the height of the top of the support **10** with respect to the top of the table by sliding the support **10** up or down in the socket **12** and locking it in place by any suitable means, such as a set screw. With set screw **11** loosened, pole **4** may be extended or retracted, and it may also be swung around its socket **12** in a pivotal manner. It is thus raised or lowered, pivoted clock-wise or counter clock-wise, and extended or retracted, until the pad **9** is positioned generally as shown against the shoulders, cervix, and head **18** of the patient **3**. The appropriate set screws or other equivalent fastening and locking devices are then tightened so that the pad **9** is secured in this desired position.

A similar procedure takes place with respect to the posterior-thigh pad **6** until it is positioned roughly as shown at the right hand side of FIG. **1**. Preferably, the central point of thrust through horizontal pole **5** should be directed against the patient below the buttocks, and there should be a substantial extension of pad **6** along the extent of the back portion of the upper thighs of the patient. This pad also is then secured in place by tightening set screws or equivalent devices as has been described. It is understood that the sockets **12** may be holes extending completely through the table top so that support **10** may be raised or lowered as required. However, since the total vertical travel adjustment is relatively small, typically, a matter of several inches, sockets having closed bottoms are suitable provided they are deep enough to permit this desired extent of adjustment.

In FIG. **2**, the cervical-reciprocal pad **9** as shown bearing against the head **18**, neck **13** and shoulder **19** of the patient. The head-bearing portion of pad **9** is generally designated **17** and the shoulder-bearing portion of pad **9** is generally designated **16**.

DESCRIPTION OF ALTERNATIVE EMBODIMENTS

FIG. **3** illustrates an alternate embodiment for a brace generally designated **20**. In this embodiment, the vertical support **21** is bent or otherwise formed to make a right angle bend and continue into a horizontal section **22**. The horizontal section **22**, together with the other structure to be described, forms an operatively substantial equivalent to the horizontal poles **4** or **5** as described above in connection with FIG. **1**. In addition to horizontal section **22**, there are successively telescoping horizontal sections **23** and **24**. Section **23** telescopes within section **22**, and is selectively secured in relation thereto by set screw **26**. Horizontal telescoping section **24** telescopes into section **23**, and is selectively **6** with relation thereto by set screw **25**. The left hand end of the structure illustrated in FIG. **3** terminates in one or the other of pads **6** or **9**, and the lower end is adjustably secured to a table as described above in connection with embodiment of FIG. **1**, or as is described below in connection with FIG. **4**, or by an equivalent

means. It is apparent that the structure of FIG. 3 permits a selectively fixable positioning of the pad from the vertical support 21 in a horizontal direction, as is required by the circumstances of patient size, position etc.

FIG. 4 illustrates an alternate embodiment for the bottom part of the structure of a vertical support and its connection to a table. In FIG. 4, a medical treatment table 28 is provided without being modified by the provision of a plurality of sockets or eqivalent structure. A C-clamp 31, equipped with a set screw 32 is provided as the effective means of holding the vertical support 29. The brace of this embodiment, generally designated 27, is affixed to the desired place along an edge of table 28, by loosening set screw 32, and moving the C-clamp 31 to the desired position, and then retightening set screw 32. Another system or means for adjusting the vertical height is illustrated in FIG. 4. In this embodiment, the bottom of vertical support 29 is threaded, and a threaded collar 30 is provided. Collar 30 is fixed to C-clamp 31 and the vertical support 29 may be screwed in or out of it to be desired selected distance, thus adjusting the height of the top of the vertical support 29.

It is understood that in the case of the embodiment of FIG. 4, the top portion, not shown, may be of the form shown in FIG. 3, or the form as shown in FIG. 1. It is also possible to provide the necessary vertical adjustment in the FIG. 4 embodiment, by having the base vertical support 29 be slidable within a smooth socket 30 and having the securement made by a set screw or similar mechanical device. It is likewise true that the horizontal adjustment means as shown in FIG. 3 or as shown in FIG. 1 may be used with either the bottom structure as shown in FIG. 4 or as shown and described in connection with FIG. 1. In general, it may be said that the various horizontal and vertical adjusting means shown and described in connection with the preferred and alternate embodiments are freely interchangable. The particular adjusting, extending, padding, rotating, clamping and locking expedients disclosed are examplary, and other devices with equivalent functions may be used.

In general, it may be said that the brace comprises a pair of pads, one a cervical-occipital pad, the other a posterior-thigh pad, each of the pads being independably supported on a main brace structure. The main brace structure comprises a vertical adjustment, a horizontal adjustment, means to support the main brace on or with relation to a medical treatment table, and means to pivot the pads around the point of said support.

The scope of the invention is determined by the spirit thereof and the appended claims, and is not limited to the specific illustrated and described embodiments.

I claim:

1. A medical restraining device adapted to be secured to a treatment table to prevent a patient undergoing spinal treatment while lying on a side in a curled position from inadvertently violently kicking or straightening, comprising:

a. a first main brace structure including:

1. a vertical support having a base secured to said table and a top, mounted on said base and having a selectively settable vertical adjustment,

2. a horizontal support, affixed near one end thereof to said vertical support near said top thereof, and having a selectively settable horizontal adjustment,

3. a cervical-occipital pad affixed to the other end of said horizontal support, and bearing against the cervix and occiput and upper shoulder portion of said patient,

3. pivoting means to permit said pad to be selectively pivoted around said base,

b. a second main brace structure including:

1. a vertical support having a base secured to said table and a top, mounted on said base and having a selectively settable vertical adjustment,

2. a horizontal support, affixed near one end thereof to said vertical support near said top thereof, and having a selectively settable horizontal adjustment,

3. a posterior-thigh pad affixed to the other end of said horizontal support and bearing against the posterior and thigh of said patient,

4. pivoting means to permit said pad to be selectively pivoted around said base,

Said respective bases of said first and second main brace structures being spaced apart a selectively settable distance.

2. A medical restraint device as set forth in claim 1 wherein each vertical and horizontal adjustment means includes selectively operable locking means to hold said vertical and horizontal supports in selected vertical and horizontal adjusted positions.

3. A medical restraint device as set forth in claim 2 wherein each of said cervical-occipital and posterior-thigh pads are resiliently padded and are contoured respectively to bear against the cervical-occipital-shoulder region of the patient and the upper thigh and lower buttocks region of the patient.

4. A medical restraint device as set forth in claim 3 wherein said adjustment and locking means comprise a plurality of mutually telescoping sections having a separate locking means at each point where one of said sections telescopes into another.

5. A medical restraint device as set forth in claim 3 wherein said adjusting and locking means comprise a hole transverse to the long axis of one said support, settable slidably receiving another said support, and locking means provided on said first support adjacent said hole.

6. A medical restraint device as set forth in claim 3 wherein a plurality of sockets are provided affixed to said table, and the said base of each said vertical support fits into one of said sockets and is vertically selectively movable with respect thereto, to provide said vertical adjustment.

7. A medical restraint device as set forth in claim 6 wherein said plurality of sockets are disposed adjacent one edge of said table.

8. A medical restraint device as set forth in claim 6 wherein each of said sockets is affixed to a clamp, each of said clamps being selectively movable and provided with locking means, to position each said vertical support at any desired point along the edge of a medical treatment table.

9. A medical restraint device as set forth in claim 6 wherein said pivoting motion is provided by a pivoting fit between said base of said vertical support and said socket into which said support fits.

10. A medical restraint device as set forth in claim 3 wherein said vertical support bases are positioned along a line passing parallel to the general length of the patient, on the side of the patient away from the spine of said patient and said bases are spaced along said line a distance greater then the general length of said patient in said curled position.

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