

United States Patent

Vezina

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[54] **PEDIATRIC DEVICE FOR
IMMOBILIZING A PATIENT-CHILD**

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[51] Int. Cl.A61g 13/00

[58] Field of Search269/322, 323, 328, 71; 108/1,
108/12; 128/70; 250/50, 54, 55; 5/101, 61, 105

[56]

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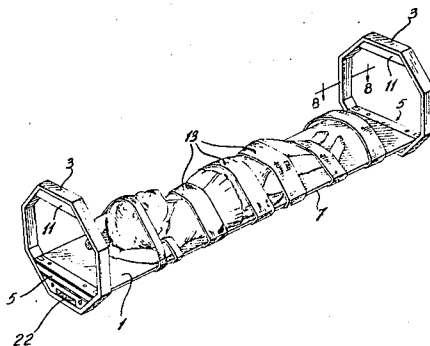
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[57]

ABSTRACT

A pediatric device for immobilizing a child for a period of time, the device formed of a resting board fixed at the ends thereof to a pair of spaced upright equal regular octagonal hoops, similarly oriented. The resting board is fixed eccentrically in relation to the hoops and the plane thereof is parallel to one side of each hoop.

8 Claims, 11 Drawing Figures



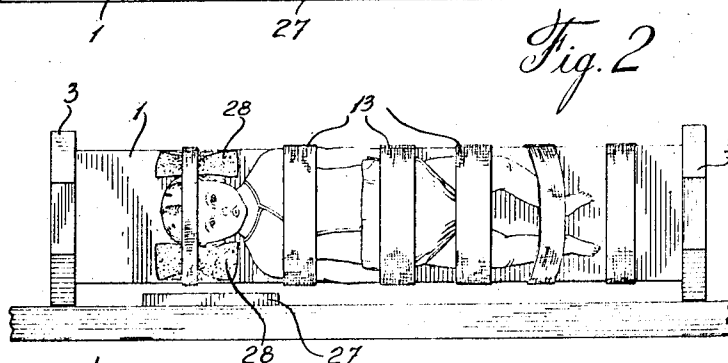
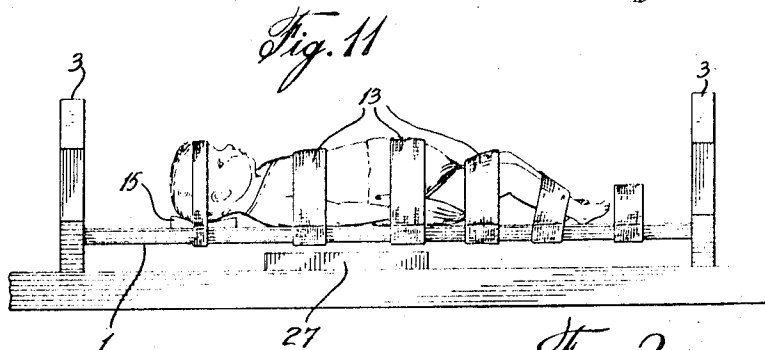
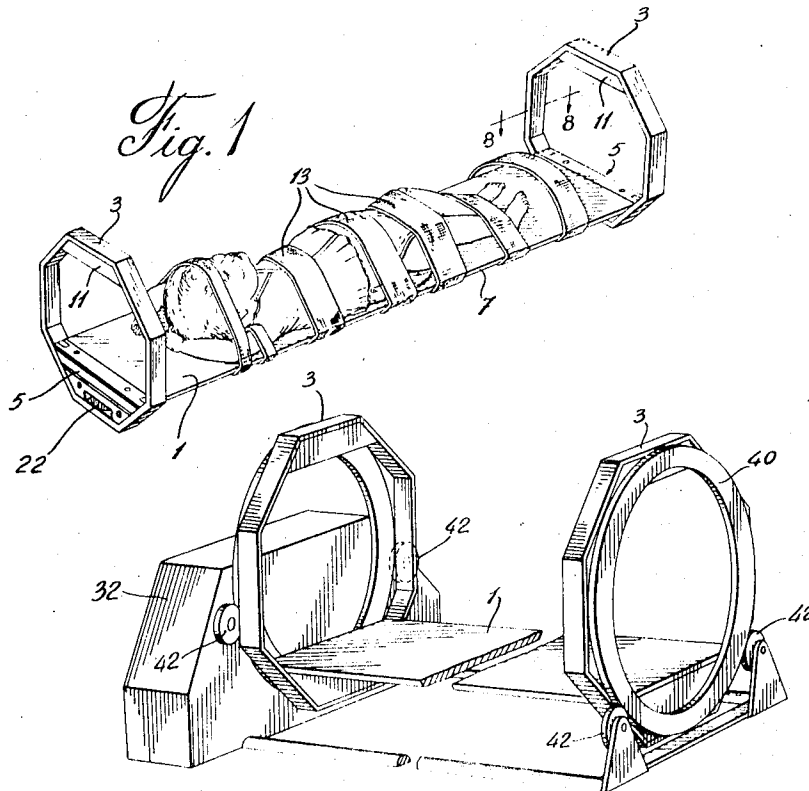


Fig. 3

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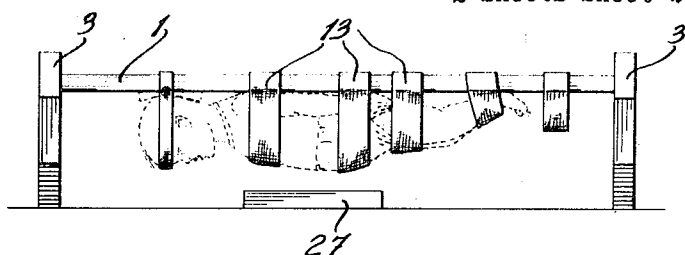


Fig. 4

Fig. 5

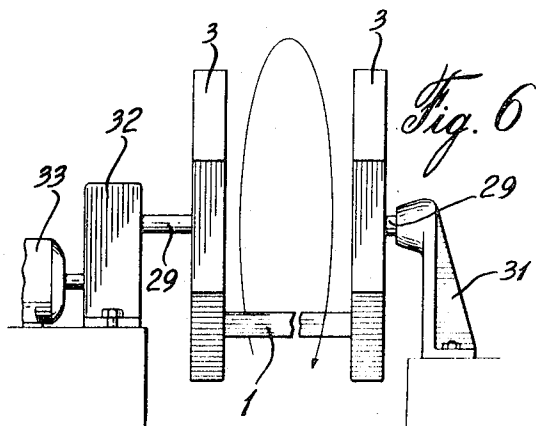
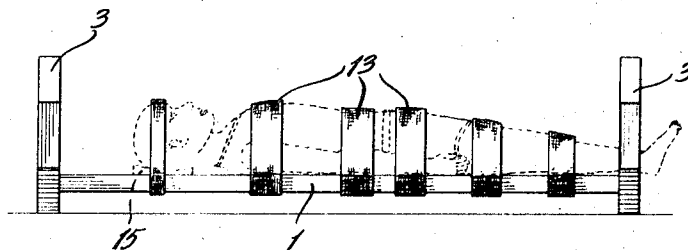


Fig. 6

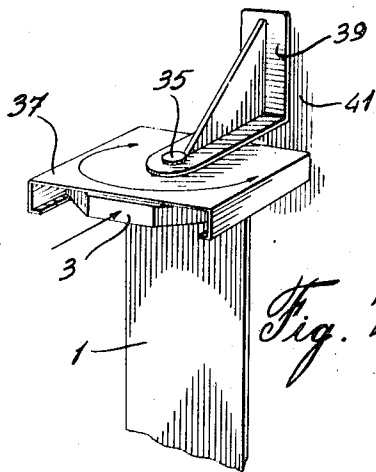


Fig. 7

Fig. 8

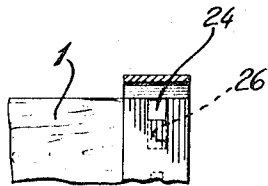


Fig. 9

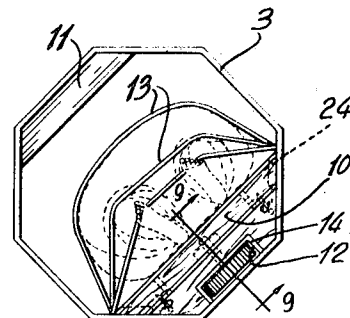
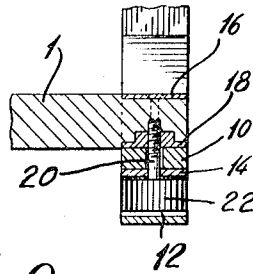


Fig. 10

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PEDIATRIC DEVICE FOR IMMOBILIZING A PATIENT-CHILD

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a pediatric device for immobilizing a patient-child rapidly and with simplicity and for an extended period of time.

Such a device is useful to obtain X-ray photographs, carry out an X-ray treatment, a surgical operation or any other treatment, injection, manipulation or carry out any other techniques that would otherwise be impossible or unsatisfactory because of the child's movements.

2. Description of the Prior Art

The major problem in radiological technique for children is that of their immobilization. The apparatuses conceived for this purpose are generally highly specialized and very expensive which tends to prevent their diffusion and general use.

Furthermore, the presently known apparatuses are complicated and only lend themselves to certain specific positions, are uncomfortable and have little transparency to diagnostic radiations. They have little versatility in regard to different uses, treatments, etc. and do not adapt themselves well to the specific needs of the treating attendant, the patient being treated or with regard to a situation or treatment.

Some of the presently existing devices form an integral part of a complete radiographic and fluoroscopic operating machine and are not available in simple form. Such device for immobilizing and positioning children is disclosed in U.S. Pat. No. 2,926,256 but the latter is designed as a toy to receive the child and ensure his calmness by diverting his mind. Although it permits positioning of the child in any desired direction, it only relies on the psychology of the child for maintaining sufficient calmness to subject him to various examination. This is at best unreliable as often a child in possession of a toy is more excited and more restless than without it. In addition, the device is not intended for the younger children that are too young to yet appreciate a toy. Furthermore, this device is not made to be used for horizontal positions which, in certain cases, are absolutely necessary. In other devices such as those described in U.S. Pat. No. 3,040,174 to Robin and No. 3,215,834 to Tayman, the child is immobilized on an operating table by means of hand and foot holding bands. In order to take side and oblique radiographies, it is necessary to move the camera sideways and to provide the operating table with additional lateral film cassettes. In the case of special oblique radiographies, it is necessary to completely change the position of the child and, as in U.S. Pat. No. 3,040,174, this requires the complicated process of untieing and retying the holders while repositioning the child. This is a time-consuming operation which very often fails to give satisfactory results. Similar remarks may be made with regard to the device of U.S. Pat. No. 3,215,834 wherein the complete supporting platform has to be raised and securing means such as sandbags or sponges must be placed on the back of the platform. Again, in order to find the right angle and the right position of the platform, a certain amount of time is necessary.

SUMMARY OF THE INVENTION

An object of the present invention is therefore to provide a pediatric device that will overcome the above-mentioned drawbacks. More specifically, the invention lies in the provision of a resting board or platform secured, at the ends thereof, to two equal polygonal supports, similarly oriented. The board or platform is located eccentrically with regard to the polygonal supports and there is provided a number of securing straps for immobilizing the child on the platform.

Another object of the invention lies in the provision of a device as afore-described which is made of very simple elements assembled together in a very easy manner and that is capable of immobilizing the patient-child in various orientations.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood by the description that follows of a preferred embodiment having reference to the appended drawings wherein:

FIG. 1 is a perspective view of a pediatric device made according to the invention;

FIG. 2 is a side elevation view of the device of FIG. 1 showing the patient-child in horizontal dorsal position;

FIG. 3 is a side elevation view similar to that of FIG. 2 with the child in lateral position;

FIG. 4 is a side elevation view similar to that of FIGS. 2 and 3 with the child in ventral position;

FIG. 5 is a side elevation view similar to that of FIG. 2 illustrating the device as used with an older child and wherein the child's feet extend through one polygonal support;

FIG. 6 is a broken and shortened side elevation view of the device according to the invention mounted to be pivoted by an electro-mechanical rotating mechanism;

FIG. 7 is a partial perspective view of the device mounted vertically and rotatably onto a wall fixture;

FIG. 8 is a partial sectional view taken along line 8—8 of FIG. 1;

FIG. 9 is a partial sectional view taken along line 9—9 of FIG. 10;

FIG. 10 is an end view of the device; and

FIG. 11 is a perspective view of another modification of the invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

As shown in FIGS. 1 to 5, the device of the invention generally comprises a resting board or platform 1 fixed, at the ends 5 thereof, to two upright parallel identical octagonal hoops 3. Although octagonal hoops are shown, it will be understood that other polygonal supports can be used although the octagonal ones are preferred. Similarly, the supports may be solid polygons although, again, hoops are preferred since they are hollow and thus can be used for exceptionally tall children, as shown in FIG. 5, and they are lighter thus making them more manageable.

Preferably, the resting board is made of light, solid, homogenous and X-ray transparent material such as wood (balsa, cedar, poplar, etc.) and plastics (Plexiglass, fiberglass).

If the device is to be used for an X-ray operation, the two longitudinal edges 7 of the board 1 should be bevelled at 45° in order to reduce shadows.

The octagonal hoops 3 are preferably made of rigid metal. As would be observed, the resting board 1 is secured eccentrically to the two hoops 3 and is parallel to one side of the hoops. In order to achieve as much stability as possible in any orientation of the child, the location of this board 1 should be such that the center of gravity of the combined board and child be as close as possible to the center line through the two hoops 3. More stability may of course be obtained by providing counterweights 11 on the sides of the hoops facing the board 1.

As a study of FIGS. 2 to 4 will reveal, the device will allow positioning of the child in natural as well as other useful positions such as those making 0°, 45° and 90° with the horizontal. It will be understood that by increasing the number of sides of the hoops 3, other intermediate positions will be available.

The child is immobilized on the board 1 by means of securing straps 13, preferably of the type known by the trademark "Velcro" secured to board 1 and that can be fastened and released instantly. Sterilized straps must of course be used for certain operations. The number of straps to be used will of course depend on the size of the child and also, to a certain extent, on the position he is to lie.

As is customary, cushions such as 15 and 28 of FIGS. 2 and 3 are used for the comfort of the child.

The usual film cassette 27 is located beneath the board 1 and the operating table 9. When the device is used in vertical

position, one of the hoops 3 serving as a base as will hereinafter be explained, the cassette is then secured to the back of board 1 by way of any known means.

In the case of fluoroscopic operations and radiotherapy, manual or motorized remote control operation is necessary and in such a case, the pediatric device of the invention is mounted for rotation as shown in FIG. 6, which is of particular use for motorized rotation. In such a case, each hoop 3 has journal means comprising a laterally projecting axle 29 mounted, for one hoop, on an upright bearing 31 and, for the other hoop, on a speed reducer 32 actuated by a motor 33. Bearing 31 may also be replaced by a roller on either side of the corresponding hoop 3 and a circular hoop fixed to the said hoop 3, to roll over the rollers. This arrangement is useful in the case of tall children, as in FIG. 5.

As mentioned previously, the device may be used with the child in upright position, head up or down. FIG. 7 illustrates a preferred supporting device for such use wherein each or one hoop is slid into a guide 37 having channel-shaped intumed edges, guide 37 is pivotally mounted at the center thereof, through a pivot 35, to a bracket 39 secured to a wall 41. Such supports as illustrated in FIG. 7 will not only hold the device in upright position but will allow it to take on various orientation as emphasized by the arcuate arrow.

FIGS. 8, 9 and 10 illustrate a preferred manner of securing the board 1 to the hoops 3. As shown, a transverse wooden beam 10 is fixed at the bottom of each hoop 3, facing the counterweight 11, and the beam is formed with a groove 12, centrally thereof, surrounded by metal plates 14. The corresponding end of the board 1 has top end bottom transverse stiffening plates 16, 18, respectively. A tightening screw 20 freely extends successively through plate 14 and beam 10 to thread into appropriate holes through bottom plate 18 and board 1. For operating screw 20, the latter is provided at the lower end with a knurled knob 22 housed into the groove 12. Also, each hoop 3 is provided on two sides with guiding blocks 24 (FIG. 8) while the corresponding end of the board 1 has lateral grooves 26 intended to receive the said blocks 24 when setting the said board into position.

FIG. 11 illustrates a mechanism as seen in FIG. 6 including a circular hoop 40 fixed over the other hoop 3 and rollers 42 on either side of the circular hoop to rotatably support the other hoop 3 and the circular hoop 40.

It will of course be understood that various other means, as ordinary screw means, or clip means or the combination on these two may be used for securing the board to the hoops 3.

One important advantage to be derived from the above-described device is that the child is tightly secured to the device and remains secured to it during the various stages of the examination. Furthermore, experience with the device has shown that the child is not only held firmly but so comfortably that he frequently falls asleep during the operation.

The device is also extremely simple in operation and its orientation can very easily be changed without disturbing the child, thus allowing various examination of the child in a very comfortable manner.

It will also be readily seen that the device can be manufactured very cheaply and yet is very efficient. By the same token, the parts can easily be changed.

I claim:

1. A pediatric device for immobilizing a patient during radiological operations or similar medical acts, and turning the patient's body about his length, the said device comprising:

a. a rigid resting board on which said patient is to be secured in an outstretched position;

b. a pair of relatively narrow supporting hoops, said hoops being in the form of equilateral polygons having corresponding sides thereof parallel, each of said corresponding sides constituting a supporting surface upon which the device may rest,

c. means for rigidly, non-rotatably securing the ends of said board over substantially the entire width thereof to said supporting hoops parallel to one side of the hoops in a substantially eccentric position relative to the axis passing through the center of both hoops, so that the board has a fixed orientation relative to the sides of the hoops, whereby no movement is permitted between said board and said hoops,

d. means to secure said patient on said board in said outstretched position, wherein a patient secured on the board may be rotated about the length of his body by rotating the hoops and by resting the latter on two corresponding sides.

2. A device as claimed in claim 1 wherein said supporting hoops are octagonal.

3. A device as claimed in claim 1 comprising counterweights mounted between said board ends and the sides of said hoops parallel and most adjacent said board ends, wherein the stability of said device is increased when resting on said most adjacent sides.

4. A device as claimed in claim 1 including means to pivotally suspend said board and supporting hoops when the board is in a vertical position.

5. A device as claimed in claim 4 wherein said means comprise:

a gripping member having channel-shaped lateral edges into which one of said supporting hoops is slidably received;

a wall bracket having a horizontal branch, and means to pivotally mount said supporting hoops about their centers, onto said gripping member.

6. A device as claimed in claim 1 including motor means for rotating said resting board and hoops about the said axis of said hoops.

7. A device as claimed in claim 6 wherein said motor means comprises a motor and speed reducer assembly operatively connected to the center of one hoop and bearing means for supporting the other hoop.

8. A device as claimed in claim 7 wherein said bearing means comprises a circular hoop fixed over said other hoop and a roller on either side of said circular hoop to rotatably support said other hoop and circular hoop.

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