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CHILD IMMOBILIZER FOR X-RAY PROCEDURES

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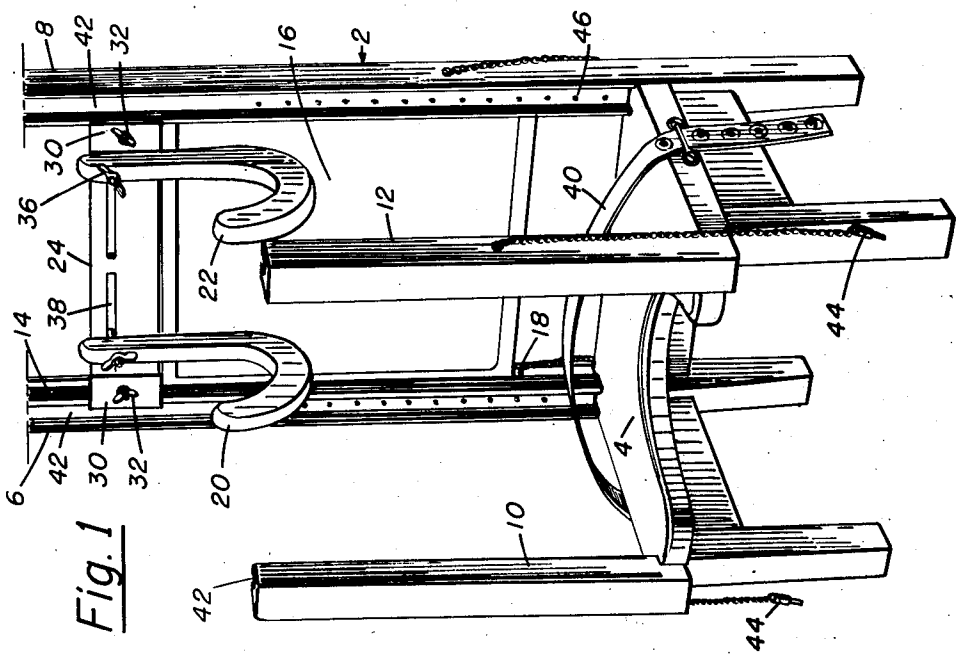


Fig. 1

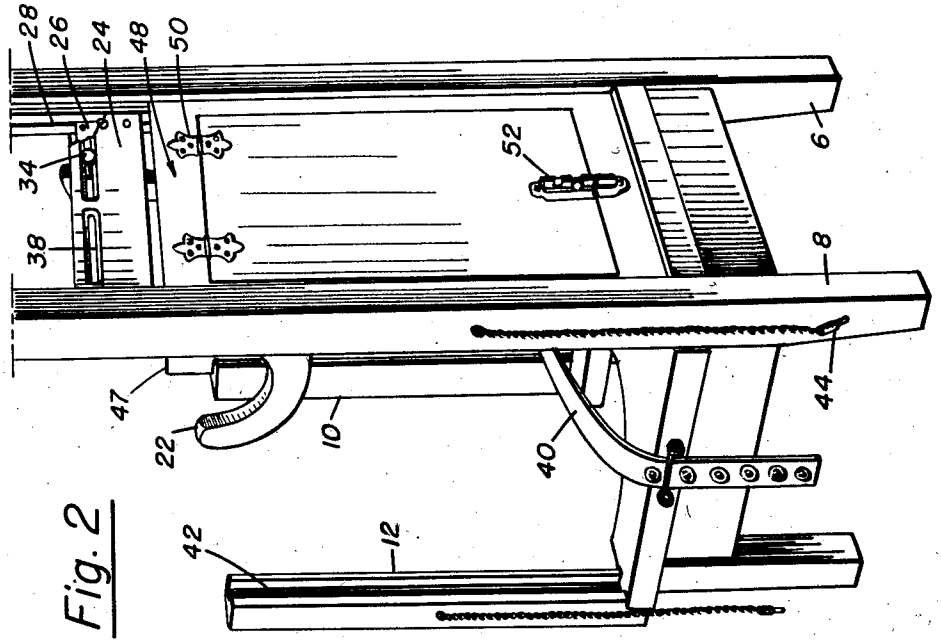


Fig. 2

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CHILD IMMOBILIZER FOR X-RAY PROCEDURES

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to a child immobilizer for X-ray procedures.

Prior art child immobilizers suffer from the defects of being usually relatively complicated and therefore expensive in construction and relatively inflexible in operation in that, in general, they permit of taking only an anterior-posterior X-ray picture. An object of the present invention is, therefore, to provide a child immobilizer which is simple in design, inexpensive to construct, and which is adapted to facilitate the taking of X-ray pictures, both anterior-posterior and lateral, without having to move the child and which has immobilizing means adjustable to retain the child in different positions against undesired movement.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

Fig. 1 is an elevation view of a preferred embodiment of the invention looking from a front corner thereof and with a film holder in place for an anterior-posterior X-ray; and

Fig. 2 is an elevation view of the embodiment of Fig. 1 looking generally from a rear corner thereof and partially broken away to show a construction of the axilla support, with the anterior-posterior film holder replaced by a removable back.

Reference is now made to the drawings wherein the numeral 2 indicates generally a preferred embodiment of the invention having the general form of a chair with a seat portion at 4. Means for receiving and retaining X-ray film holders or cassettes are provided conveniently in the form of posts upstanding from the seat area, there being at least one post at the rear but preferably four which are located generally at the four corners of that area, the two rear posts being designated as 6 and 8 and the two front posts as 10 and 12. Each post can be made integral with a leg of the chair, as are 6 and 8, or the post can be separate from the leg as are 10 and 12. Suitable means for holding and permitting the vertical adjustment of a film holder are provided in the rear posts in the form of a rabbet or channel 14 in post 6 and a similar cooperating opposed groove (not visible) in post 8. Alternatively, the cassette could be supported by a single post by, for example, the simple expedient of having the channel in the post formed with an undercut and a corresponding tongue formed on the cassette to key it to the channel. However, a two-post support structure is more rigid. The film holder or cassette 16 (Fig. 1) is thus slidable up and down along the length of the rear posts and is held in any desired position of vertical adjustment by pegs 18 which can be plugged into any one of a series of holes drilled into each post at the base of its groove. The term "vertical" as used throughout this application is intended to mean along the direction of the length of the posts and not to be restricted to the direction of the force of gravity.

For immobilizing the upper portion of the body of a child being X-rayed, means are provided in the form of a pair of J-shaped axilla supports 20 and 22 carried by a crosspiece 24 which can be mounted on one rear post but preferably is mounted on and adjustable along both the rear posts 6 and 8. The crosspiece 24 is conveniently provided with tongue portions 26 (Fig. 2) adapted to slide in grooves 28 formed in the rear posts. The crosspiece is conveniently made of wood, as is most of the rest of the device, although metal or other materials can obviously be used. The tongue portions 26 are preferably provided by metal plates fastened to the crosspiece although they could be made as integral parts of the crosspiece. The crosspiece 24, with its depending axilla supports, is held in any desired vertical position relative to the rear posts by any suitable means such as clamping plates 30 held by wing nuts 32. The supports 20 and 22 are rotatable about the horizontal by virtue of their being mounted on carriage bolts 34 or the like and can be held in any desired position of rotation by wing nuts 36. The supports are also adjustable for lateral translation relative to one another on the crosspiece by sliding the bolts 34 along the slots 38. A strap 40 completes the restraining means for holding the body of the child. For taking lateral X-ray views, film holders can be placed at either side of the child, being held in channels or grooves 42 formed in each rear post and its corresponding front post. These cassettes would be held in position similarly to the one at the back of the chair by pegs 44 plugged into any desired hole such as 46. A part of one such cassette 47 is visible in place in Fig. 2. As previously indicated for the rear cassette, the side view cassette can also, if desired, be supported by a single post, either a rear post or a front post, by the use of, for example, an undercut tongue and groove.

When no film holder is in place between the rear posts, as when it is not desired to take an anterior-posterior picture, support for the child's back can be provided by a removable chair back, generally indicated at 48 (Fig. 2) which can be slid in between the posts 6 and 8 in place of the film holder. Since, for comfort, the forward upholstered portion of the slidable back 48 bearing against the child may extend forward of the rear edge of the crosspiece 24 and the latter would thus obstruct its removal, it is desirable to hinge the upholstered portion as at 50 so that it can be swung out of the way when it is intended to remove the sliding back 48 from the device. The upholstered portion of the back is normally held in proper supporting position by any convenient means such as a sliding door bolt 52.

Operation

In using the device, a child is placed on the seat and the strap 40 tightened over the thighs. The axilla supports 20 and 22 are then adjusted with the child in whatever position is suitable for taking the desired pictures. For example, each support can be placed under its corresponding axilla and the torso of the child is thus more or less cradled in the J-shaped supports. For other pictures, the arms of the child can be brought together with the hands somewhat clasped over the head and the axilla supports can then be elevated and inclined about the horizontal so as to form a clamp bearing against the lateral surfaces of the upper arm portions of the child, thus holding the arms overhead. A film holder is then slipped in between posts 6 and 8, if an anterior-posterior view is desired, and between posts 6 and 10 or 8 and 12 if lateral views are required and the pictures

can then be taken with full confidence that the child is immobilized. For taking a posterior-anterior X-ray, the child is seated on the chair facing the back of the chair with the chin resting on the crosspiece 24, which is lowered to the correct level. The child's chest is then flush against the cassette at the back of the chair. The device can also be used for immobilizing the child for X-ray treatments.

Obviously, many other modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An immobilizer generally in the form of a chair for a child being X-rayed comprising a seat; four posts upstanding from the seat, two of said posts being spaced from each other at the rear of the seat to define the back area of said chair and the other two of said posts being spaced from each other at the front of the seat so that each of said front posts defines with its corresponding rear post a side area of said chair; opposed cooperating guiding surfaces on said rear posts adapted to slidably receive and retain a film holder and, alternatively, a back for supporting the body of a child; means for maintaining a film holder in various positions of adjustment along said guiding surfaces; opposed cooperating guiding surfaces on each rear post and its corresponding front post adapted to slidably receive and retain a film holder for taking a lateral view X-ray; means for maintaining said last-mentioned film holder in various positions of adjustment along its guiding surfaces; and means for immobilizing the upper portion of a child's body, including a pair of J-shaped axilla supports, means mounting said axilla supports on a crosspiece for translational adjustment relative to one another and each for rotational adjustment about a generally horizontal axis passing through the stem of its respective J generally perpendicular to the back of said chair, means for retaining said axilla supports in desired positions of adjustment relative to said crosspiece, means mounting said crosspiece for sliding engagement with and adjustment generally vertically along said rear posts, and means for retaining said crosspiece in adjusted position relative to said rear posts.

2. An immobilizer generally in the form of a chair for a child being X-rayed comprising a seat; means for receiving and retaining a film holder in desired positions of vertical adjustment along the back of said chair, to take an anterior-posterior view of a child; means coacting with said first-named means for receiving and retaining a film holder in desired positions of vertical adjustment along the side of said chair for taking a lateral view of a child; and support means carried by said first-named means for immobilizing the upper portion of a child's body, said support means being mounted for adjustment vertically, laterally, and for rotation about the horizontal.

3. An immobilizer generally in the form of a chair for a child being X-rayed comprising a seat; four posts upstanding each from one of the four corners of the area generally constituting the seat; cooperating means on the two rear posts for receiving and retaining a film holder at desired vertical positions of adjustment; cooperating means on each rear post and its corresponding front post for receiving and retaining a film holder at desired vertical positions of adjustment; and means carried by said rear posts and adjustable vertically, laterally and rotationally for engaging and restraining against undesired movement the upper portion of the body of a child being X-rayed.

4. An immobilizer for a child being X-rayed comprising a seat; at least one post upstanding from the rear of the area constituting the seat; means on said post for receiving a film holder and retaining it at desired vertical positions of adjustment in a location to take an anterior-posterior X-ray of a child; means on said post for receiving a second film holder and retaining it at desired vertical positions of adjustment in a location to take a lateral X-ray of a child; means carried by said post and adjustable vertically, laterally, and rotationally for engaging and restraining against undesired movement the upper portion of the body of a child being X-rayed.

5. An immobilizer for a child being X-rayed comprising a seat; post means upstanding from the seat for supporting a film holder; means for retaining said film holder at desired vertical positions of adjustment on said post means in a location to take an anterior-posterior X-ray of a child; means capable of being operated simultaneously with said retaining means for retaining a second film holder at desired vertical positions of adjustment on said post means in a location to take a lateral X-ray of a child whereby an anterior-posterior X-ray and a lateral X-ray can be taken simultaneously, or sequentially, without moving the child relative to the post means; and adjustable means for restraining the body of a child against movement.

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