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Cabansag

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[54] **DEVICE FOR POSITIONING SUBJECT FOR X-RAY**

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[51] **Int. Cl.** **G03b 41/16**

[58] **Field of Search** 250/444, 451, 456, 439; 269/328; 128/377

[56] **References Cited**

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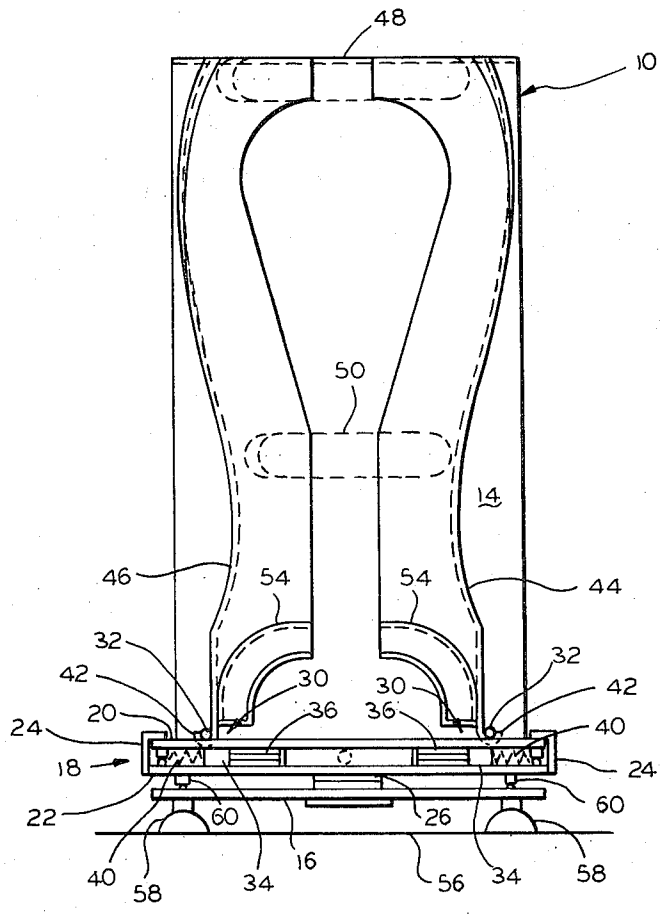
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[57] **ABSTRACT**

A device for positioning and restraining children for X-rays in which a seat type device is pivotally attached to a base, whereby the restrained child can be X-rayed in all positions through use of X-ray film mounted on an upright board member disposed adjacent the seat. A pair of side-by-side restraining means are adapted for pivotal movement adjacent one another to provide means to substantially completely hold the child's arms, torso and legs against movement. The restraining means and their respective pivot points are adjustable to accomodate children of various sizes.

11 Claims, 3 Drawing Figures



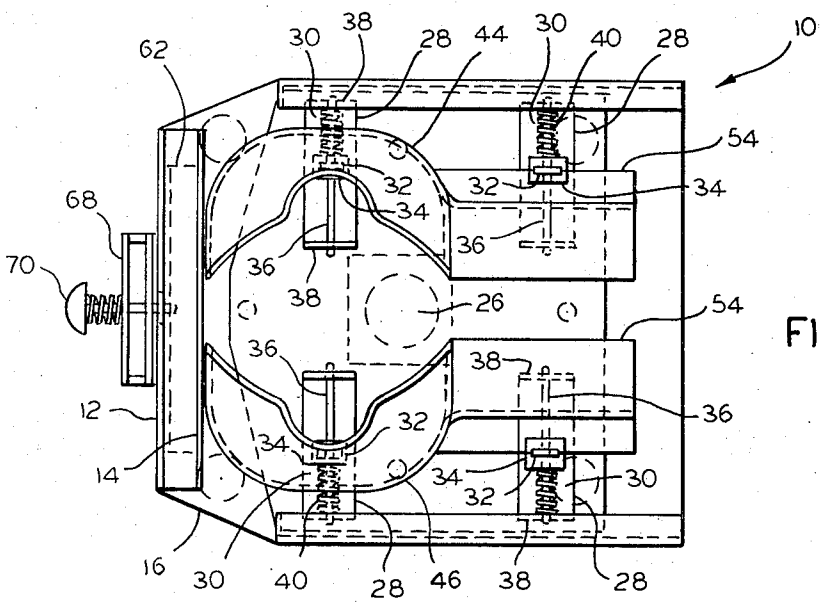

10
62
30
38
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44
30
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32
34
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68
70
26
12
14
16
46

FIG.1

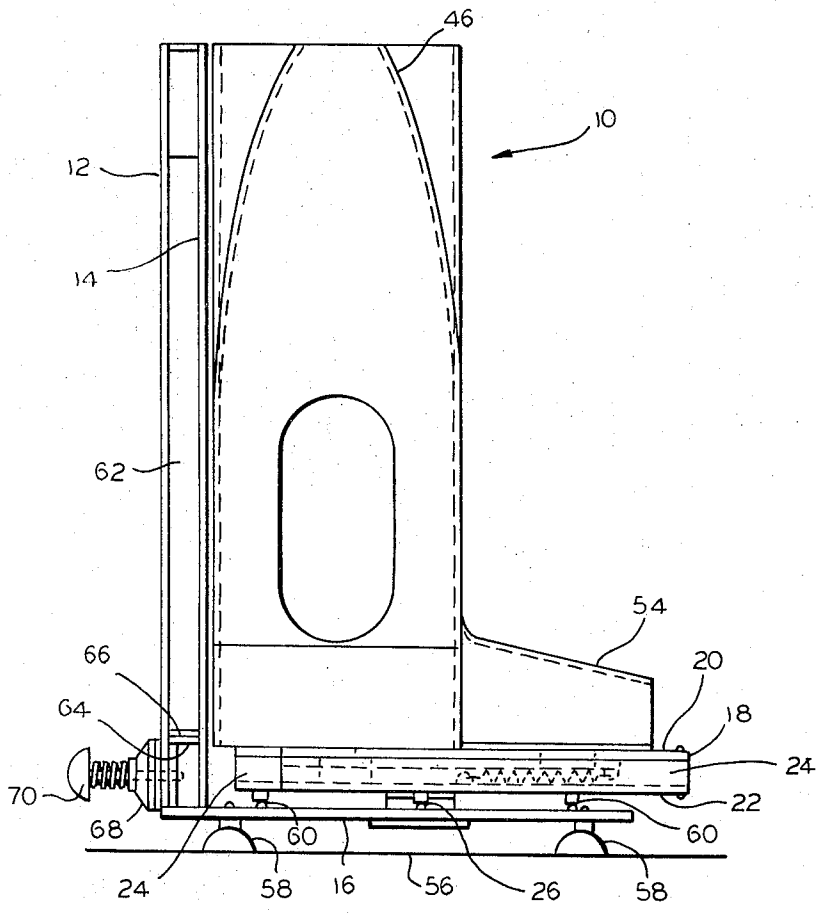

46
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12
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62
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66
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64
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24
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FIG.2

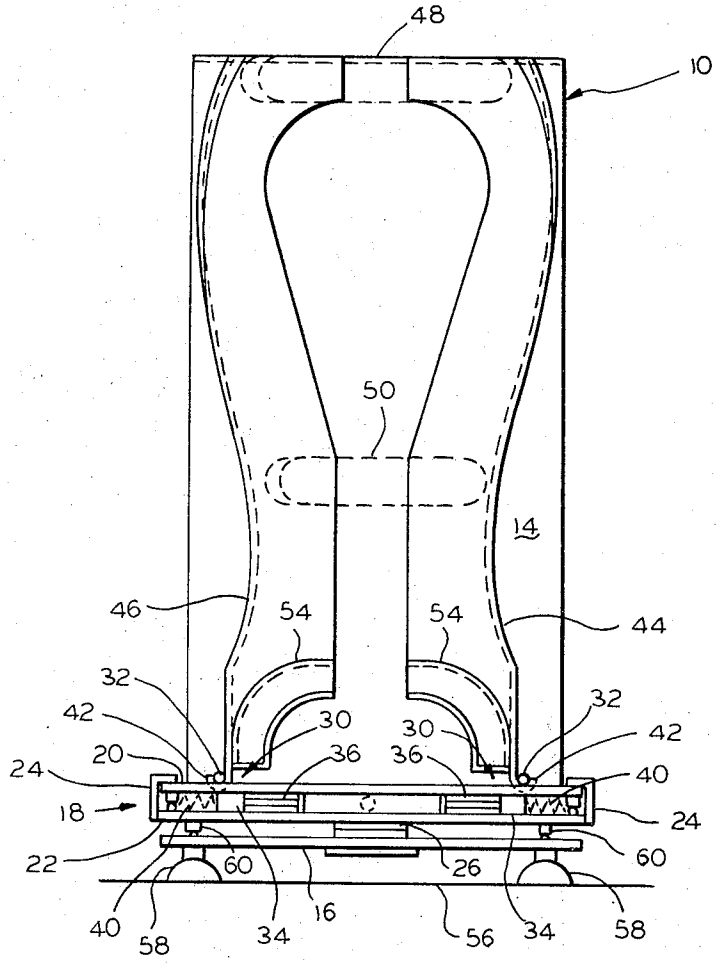

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FIG.3

DEVICE FOR POSITIONING SUBJECT FOR X-RAY

The present invention relates to devices for positioning and restraining a subject during X-rays, and in particular to an apparatus for positioning infants and young children so that they cannot move during exposure to X-rays.

When taking X-rays, it is essential that the subject be kept motionless. A moving subject results in the formation of a double or clouded image on the negative or film. This necessitates the re-taking of the X-ray, therefore wasting film and exposing the subject to additional amounts of X-rays, which can be harmful if absorbed in large amounts.

With children, it is even more difficult to keep the subject motionless. Generally, it is necessary for one parent to be in attendance when a child is having an X-ray picture taken of his body. The parent is needed to hold the child or position the child's arms away from his body. The parent usually cannot hold the child still, and in addition, the child is confused and frightened by the X-ray procedure. Further, the parent is exposed to unnecessary radiation due to his or her proximity to the X-ray apparatus.

Devices have heretofore been produced which enable a single person, such as an X-ray technician, to properly locate and restrain a child in front of an X-ray machine. These devices have proven inadequate because ease of positioning is difficult, and the child is disposed in an uncomfortable position, whereby the child or infant will cry or move after being held in position for a short amount of time. Thus, if often becomes necessary to re-take X-ray exposures when present so-called restraining means are used.

Therefore, it is an object of the present invention to provide an apparatus which completely immobilizes an infant or child in an upright seated position during the taking of X-rays.

Another object of this invention is to provide a rotatable appartus having side-by-side restraining means which pivot into and out of position to hold an infant or child in a proper and secure position during the taking of X-rays of the body, and then releases the child.

Still another object of the present invention is to provide a positioner for infants or children having pivotal side-by-side restraining means mounted on selectively displaceable pivot points to permit the positioner to be adjusted for various size children.

Yet another object of the present invention is to provide a positioner for infants or children including a pair of side-by-side restraining means contoured to fit the torso and/or legs of the infant or child.

An additional object of the present invention is to provide a positioner for infants or children which is portable and light-weight and also can be stored with ease.

A further object of this invention is to provide a positioner for taking infants' or childrens' X-rays which has an attached apparatus for movably holding various sizes of X-ray film adjacent the subjects' body.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in conjunction with the annexed drawing in which:

FIG. 1 is a plan view of the positioner according to the present invention;

FIG. 2 is a side elevation view of the positioner of FIG. 1; and

FIG. 3 is a front elevation view of the positioner of FIG. 1.

Referring to the drawings, the apparatus for restraining infants and children during the taking of X-rays is generally designated by the numeral **10.** The apparatus comprises a pair of substantially vertical radiotransparent board members **12, 14** rigidly fixed at their base or lower end to horizontal base **16.**

A seat member **18** comprising a pair of horizontal board members **20, 22** held in spaced relation relative to one another by blocks **24** is mounted on pivot **26** for 360° rotation relative to base **16.** Board member **20** includes a plurality of rectangular apertures **28** (FIG. 1) through which movable pivot means **30** extend. Each pivot means **30** includes a horizontal hinge element **32** mounted on a block member **34.** Each block member **34** has an aperture extending therethrough, and a rod **36** mounted to board **20** by means of vertically extending brackets **38** attached to board **20.** A spring **40** extends between each block member **34** and one of the brackets **38** supporting rods **36.** Springs **40** provide a lateral force for moving block members **34** toward the center of seat member **18.**

In the illustrated embodiment, means are provided to adjustably move block members **34** along their respective rods **36** for purposes to be described. It is contemplated that rods **36** have threaded surfaces extending throughout their length, which threaded surfaces engage mating threads on the interior of the apertures extending through blocks **34.** Alternatively, each block **34** may be fixed to a plate having a threaded aperture therethrough, which threaded aperture mates with the threaded surface of each rod **36.** Means such as a knob or a slot for insertion of a screwdriver may be disposed on the outward end of each rod **36** to enable the rods to be rotated. As each rod **36** is rotated, block members **34** move in a horizontal plane, thereby horizontally transposing each pivot hinge element **32.**

Each hinge element **32** is adapted to mate with a corresponding hinge element **42** located on the base of a pair of vertically extending, contoured, radiotransparent restraining means **44, 46.** These restraining means in their illustrated position extend in a side-by-side relationship, and are adapted to pivotally move away from each other about pivot means **30,** which as previously described, include substantially horizontally extending axes. The restraining means **44, 46** are contoured internally to approximately the shape of a child's body, and are held together when in a vertical position by means of releaseable attachment means, such as a pair of self-attaching radiotransparent straps **48, 50** (FIG. 3). Straps **48** extend across and secure the upper portion of restraining means **44, 46** when the latter are in an upright position and an infant or child is placed between the restraining means. Likewise, strap **50** is adapted to engage and secure an intermediate portion of restraining means **44, 46.**

The lower portion of restraining means **44, 46** includes a pair of contoured, radiotransparent leg restraining means **54,** through which a child's legs may extend when the child is seated on seat member **18.** The interior surface of each leg restraining means **54** is contoured to extend over and snuggly fit a child's legs and hold them securely.

It is readily apparent that restraining means **44, 46** may be moved toward or away from one another in a horizontal plane to accommodate children of various sizes. This is accomplished by moving hinge elements **32** along horizontal paths by turning rods **36,** thereby displacing block members **34** in a horizontal plane.

The horizontal base **16** is attached to a supporting structure **56** and held stationary thereto by means of rubber suction cups **58.** Ball bearings **60** extend between base **16** and seat member **18** to allow 360° frictionless rotation of seat member **18** about pivot **26.**

The invention also includes vertical X-ray film support means disposed between board members **12** and **14** for supporting an X-ray film **62** at the most advantageous location adjacent the subject. The X-ray support means also includes a vertically displaceable film bracket **64** disposed between board members **12** and **14.** Bracket **64** comprises a film support shelf **66,** a clamp **68** and a screw knob **70.** By vertically adjusting film bracket **64,** X-ray film of various sizes can be maintained at a proper position in apparatus **10.**

In operation, the apparatus **10** is prepared to receive an infant or child whose X-ray is to be taken by releasing straps **48, 50,** and pivoting restraining means **44, 46** away from each other about the several pivot means **30.** The child is then placed on seat member **18,** and restraining means **44, 46** are pivoted back into a vertical side-by-side relation. The contour of the restraining means is such that the child's arms and torso are held securely and motionless between restraining means **44,** 46. Leg restraining means **54** enclose the child's legs, and hold them still and secure. Straps **48** and **50** are then fastened to hold restraining means **44, 46** and leg restraining means **54** in position against the child's body.

If the child is too large or too small to be held comfortably and motionless between restraining means **44,** 46, the spacing between the restraining means can be adjusted by turning rods **36** and displacing pivot means **30** as previously described.

Thus, it is apparent that hinge means **30** may be adjusted in a horizontal plane to accommodate any size child, while restraining means **44, 46** retain their capability of pivoting about horizontal axes.

When the child or infant is securely held in apparatus **10,** X-ray film **62** is inserted between board members **12** and **14** and moved vertically to its most advantageous position adjacent the child by temporarily releasing knob **70** and vertically adjusting bracket **64.** Once the proper film height has been determined, the seat member **18** may be rotated 360° about pivot **26** to position the child for X-ray exposure from any angle.

It is apparent that the elements of the invention thus far described provide a seat to immobilize an infant or child during the process of taking an X-ray exposure of the subject, whereby the child is safely and comfortably held still in a seated position such that the seat may be rotated through 360° to properly position the subject for anterior, posterior or lateral exposures.

From the foregoing detailed description, it will be evident that there are a number of changes and modifications of the present invention which come within the province of those skilled in the art. However, it is intended that all such variations not departing from the spirit of the invention be considered as within the scope thereof as limited solely by the appended claims.

I claim:

1. In a positioner adapted to be disposed adjacent a sheet of X-ray film for restraining a child being X-rayed:

a base;

a seat member rotatably mounted on said base;

a pair of side-by-side radiotransparent restraining means contoured to the shape of said child's body and mounted to said seat member for pivotal rotation toward and away from each other about horizontal axes;

releasable attachment means associated with said restraining means to secure said restraining means in a position toward one another when attached;

whereby said pair of restraining means is adapted when positioned toward one another to substantially enclose and restrain a child placed therebetween and supported by said seat in a seated, upright position.

2. The positioner of claim **1** including:

horizontally extending pivot means mounting each of said pair of restraining means to said seat member;

said pivot means associated with each one of said restraining means being displaceable in a horizontal plane toward and away from one another whereby each of said restraining means is horizontally moveable toward or away from each other to substantially enclose and accommodate children of various sizes.

3. The positioner of claim **2** wherein said pivot means includes:

block members displaceably mounted on said seat members;

horizontal hinge elements mounted on each of said block members;

said hinge elements adapted to mate with corresponding hinge elements on the base of said restraining means;

variable screw spring adjustment means disposed between said seat member and said block members and adapted to permit said block members to move in a horizontal plane;

whereby the distance between each one of said pair of restraining means may be varied by actuation of said adjustment means.

4. The positioner of claim **3** wherein said restraining means are adapted to swing away from each other about said hinge elements on the base of said restraining means for ease of placement and removal of said child in said positioner.

5. The positioner of claim **1** including:

attachment means fixed to the underside of said base for releasably but firmly holding said base to a supporting structure.

6. The positioner of claim **5** wherein said attachment means comprises suction cups mounted on the underside of said base.

7. The positioner of claim **1** wherein said seat is rotatable through 360° relative to said base.

8. The positioner of claim **1** wherein each of said restraining means includes radiotransparent leg contoured restraining means horizontally extending therefrom and adapted to enclose and for projection of said child's legs therethrough.

9. The positioner of claim **1** wherein said releasable attachment means includes:

a first pair of self-attaching radiotransparent straps extending across an upper portion of said restraining means; and

a second pair of self-attaching radiotransparent straps extending across an intermediate portion of said restraining means.

10. The positioner of claim **1** including an X-ray film support means comprising:

a pair of substantially parallel radiotransparent board members rigidly affixed at the lower end thereof to said base, and extending vertically adjacent said restraining means;

said vertical board members adapted to receive X-ray film therebetween.

11. The positioner of claim **10** wherein said X-ray film support means additionally includes a vertically displaceable bracket member disposed between said parallel board members, said bracket member adapted to hold X-ray film elements of various sizes and at various positions in said film support means.

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