United States Patent

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[54] **X-RAY TABLE ATTACHMENT**
3 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **250/55,** 250/50
[51] **Int. Cl.** **G01n 23/04**
[50] **Field of Search** 250/50, 54, 55, 56, 57, 58

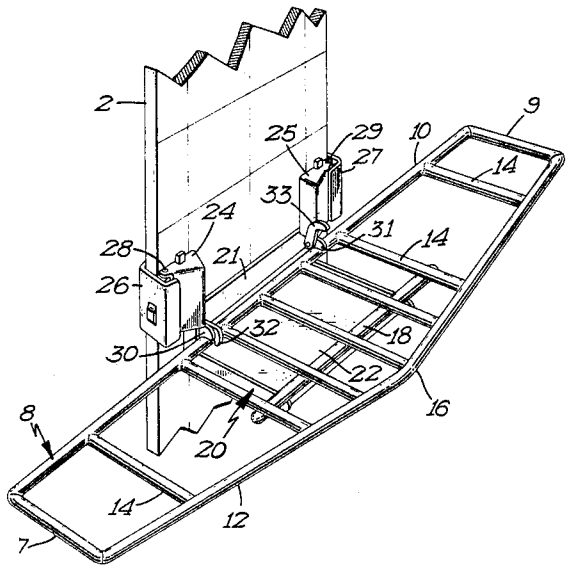
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ABSTRACT: A body-supporting frame adapted to be removably attached to a vertically oriented X-ray table in a horizontal position for the purpose of obtaining horizontal beam decubitus X-ray films of a patient's chest, abdomen, or extremities. Special bracket detents secured to the footrest of a standard, upright X-ray table may be utilized to slidably and removably support the aforesaid body rest frame on said footrest.



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SHEET 1 OF 2

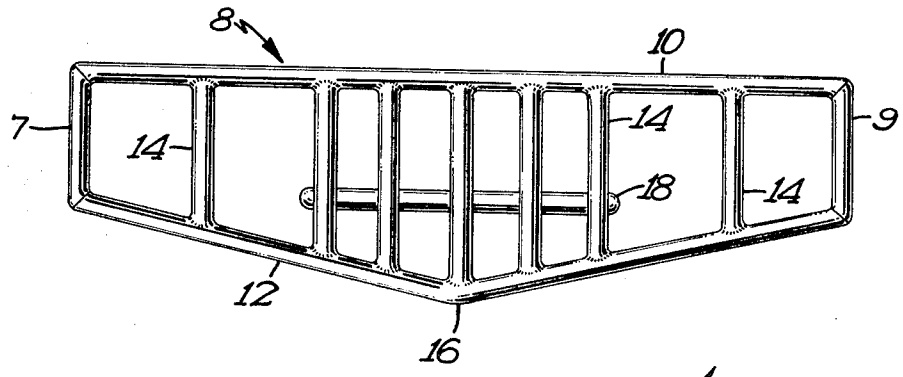


FIG 1

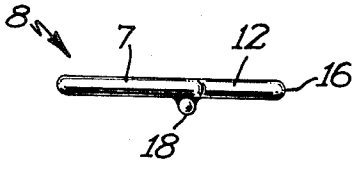


FIG 2

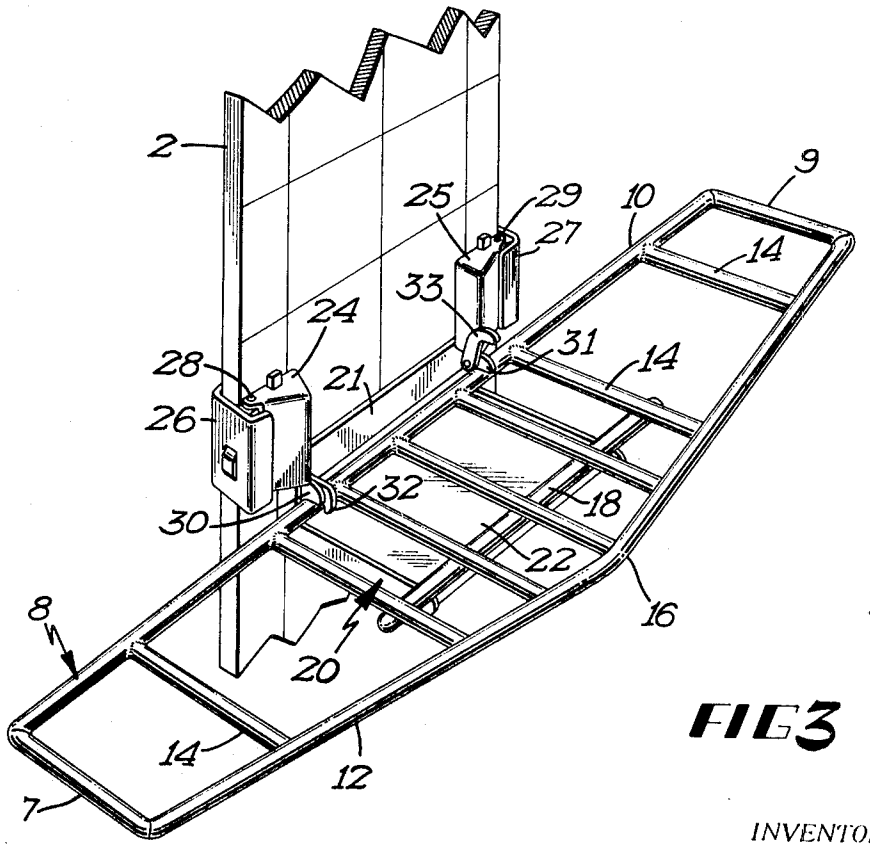


FIG 3

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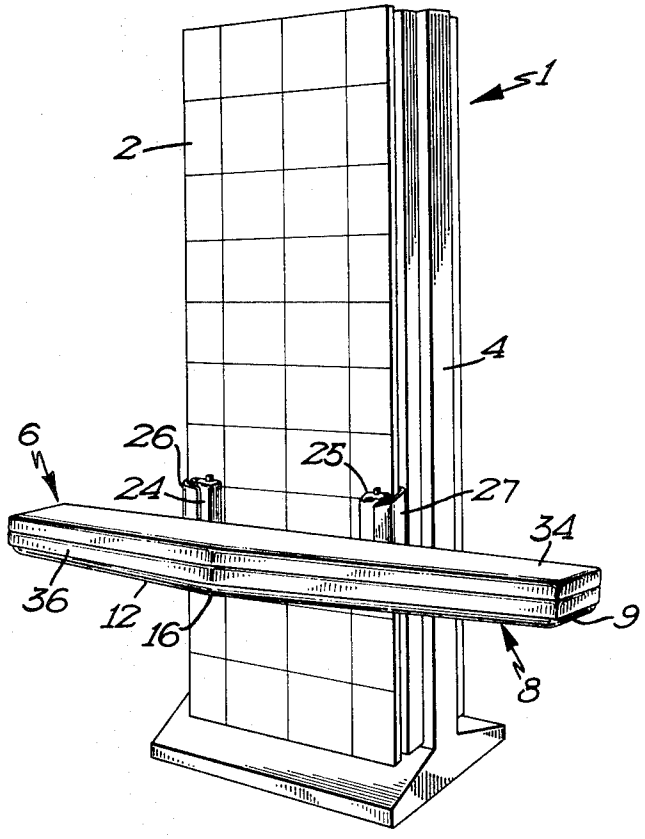


FIG 4

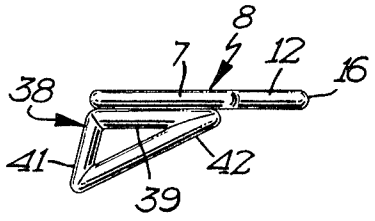


FIG 6

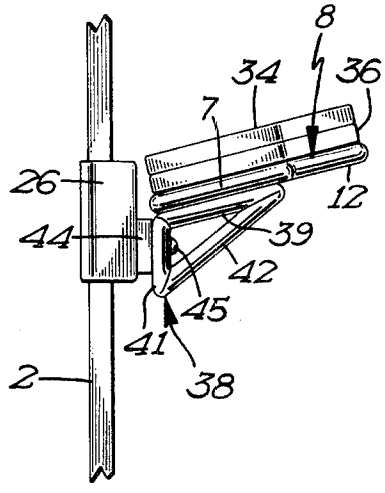


FIG 7

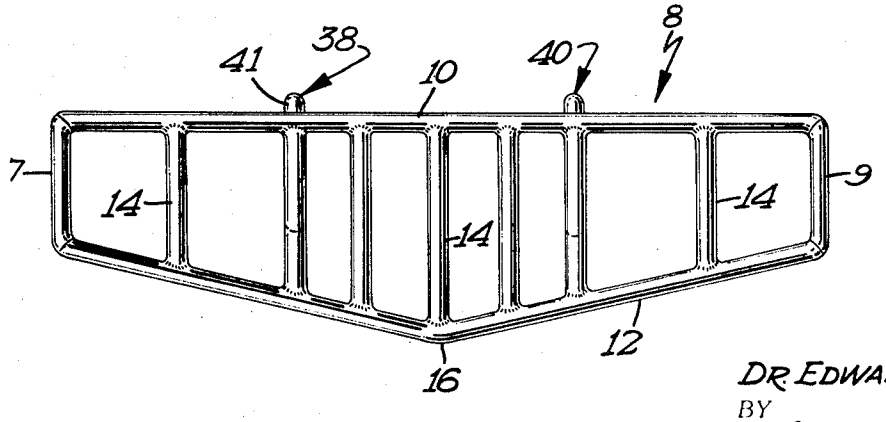


FIG 5

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X-RAY TABLE ATTACHMENT

BACKGROUND OF THE INVENTION

Conventional X-ray tables are normally provided with a footrest or platform on which a patient may stand in a vertical position with his body extending lengthwise of the X-ray table. Certain types of X-ray diagnosis require the radiologist to make what is known as a horizontal decubitus X-ray study of the patient. The taking of such horizontal beam decubitus X-ray films requires that the patient assume a horizontal position transversely of the upright X-ray table. For making exposures of the horizontal decubitus type, the patient must now be supported horizontally on a movable cot or stretcher-bed which is rolled or otherwise moved into position against the front face of the vertical X-ray table. The cot or stretcher on which the patient is resting must be braced so that it does not move away from the X-ray table, since such movement might interfere with the X-ray filming operation or cause the patient to fall onto the floor. Also, the presently available apparatus for supporting patients during horizontal, decubitus X-ray filming does not provide any means for quickly and conveniently adjusting the position of the patient laterally with respect to the X-ray table in order to bring the desired portion of the patient's body directly in front of the X-ray table within the X-ray beam.

BRIEF SUMMARY OF THE INVENTION

Having in mind the foregoing difficulties and disadvantages associated with presently known techniques for taking horizontal beam decubitus X-rays, I have developed a unique, patient-supporting attachment for X-ray tables which is particularly characterized by the ease with which it may be removably attached to a standard X-ray table in a horizontal position, and its lateral adjustablility with respect to the upright X-ray table to which it is attached.

These basic objectives are realized by the utilization of a base frame of tubular segments and specially designed brackets or detent clamps by means of which the frame may be removably secured to the footrest or table clamps of a standard X-ray table.

In one particularly advantageous form of my invention, the aforesaid, patient-supporting platform is removably supported on the footrest of an X-ray table by means of detent members attached to the footrest and restrainably engaging the platform in such a way as to permit the platform to be shifted laterally to adjust the position of the patient with respect to the X-ray table. Pivotal bracket members on the footrest assist in holding the platform in place.

A further beneficial feature of my improved X-ray table attachment resides in the provision of a patient-supporting base frame having support means secured to the underside thereof in such a manner as to hold said frame in an inclined position in which it angles upwardly and outwardly from the X-ray table to which it is attached to assist in holding patients thereon.

These and other objects and advantages of my invention will become readily apparent as the following description is read in conjunction with the accompanying drawings wherein like reference numerals have been used to designate like elements throughout the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the base frame of my platform attachment for an X-ray table;

FIG. 2 is an end view of the frame of FIG. 1;

FIG. 3 is a front perspective view of an X-ray table having a footrest incorporating novel bracket and detent members by means of which my platform attachment is removably supported thereon;

FIG. 4 is a front perspective view of an X-ray table having my complete platform assembly supported thereon;

FIG. 5 is a top, plan view of a modified form of the patient-supporting platform frame of this invention;

FIG. 6 is an end view of the frame of FIG. 5; and

FIG. 7 is a side elevation view showing the frame of FIG. 5 attached to an X-ray table.

In FIG. 1 I have shown an upright X-ray table generally indicated by reference numeral 1 of the basic type on which my platform accessory is adapted to be mounted. Table 1 is comprised of an elongated top portion 2 adjacent which the patient's body is positioned either longitudinally or transversely with respect thereto, and a rear frame portion 4. Table 1 is vertically tiltable on frame 4 about a horizontal axis in the conventional manner. The patient-supporting, accessory platform of this invention is generally indicated by reference numeral 6 and is adapted to be mounted on X-ray table 1 in a generally horizontal position for taking horizontal beam decubitus X-ray pictures. Horizontal decubitus filming has proven to be a powerful technique in the evaluation of the acute abdomen, in the determining of fluid levels in the chest, and in routine cholecystography. Such radiological diagnoses require that the patient be supported transversely of table top 2 in a horizontal manner. At the present time, there is no known accessory device by means of which a patient may be supported transversely of X-ray table 2 for decubitus filming. Litters or cots which may be moved into place transversely of table 2 are unsatisfactory in that they must be blocked or braced in place to prevent them from moving away from the X-ray table, and they do not permit any vertical adjustment of the patient with respect to the X-ray table 2.

The platform accessory which I have indicated generally by reference numeral 6 overcomes these problems by virtue of a simple and rigid frame design which may be firmly attached to X-ray table 2 for vertical movement therewith, and which may be installed and removed with a minimum of difficulty. Referring now to FIGS. 1 and 2, the basic structural component of platform 6 is an elongated frame 8 which is preferably constructed of tubular aluminum or steel. Base frame 8 is comprised of elongated, tubular sections 10 and 16 which define the opposite side edges thereof and cross braces 14 extending therebetween. Frame 8 is contoured to conform generally to the profile of a human body with projecting portion 16 accommodating the posterior extremity of the body. Tubular end sections 7 and 9 connect elongated, side members 10 and 12. In the embodiment of my invention shown in FIGS. 1 and 2, I have provided support means for frame 8 in the form of an elongated bar 18 which extends lengthwise of frame 8 and is secured to the underside of a plurality of the cross braces 14, as by welding. Support bar 18 depends below frame 8 and is disposed outwardly or forwardly from inner edge 10 thereof in such a manner as to elevate front edge 12 of frame 8 when it is mounted on base support means of an X-ray table in the arrangement shown in FIG. 3.

The X-ray table top 2 of FIG. 4 is shown in FIG. 3 with a footrest assembly generally indicated by reference numeral 20 attached thereto. Rear wall portion 21 of footrest assembly 20 is attached to X-ray table top 2 by means of mounting means comprised of table clamps 24 and 25 having bracket members 26 and 27 pivotally secured thereto at pivot points 28 and 29. Bracket members 26 and 29 engage the opposite side edges of table top 2 and may be released therefrom by being pivoted about the vertical axes defined by pivot points 28 and 29 to adjust footrest assembly 20 vertically along table top 2. Bracket members 26 and 27 are adapted to releasably engage vertically spaced locking members (not shown) on the underside of table top 2. A planar foot stand 22 extends forwardly from rear wall 21 of footrest assembly 20. Foot stand 22 is disposed substantially perpendicular to table top 2, and when table 1 is in an upright position, foot stand 22 will be horizontal. The above-described elements comprising footrest assembly 20 are normally furnished as a conventional attachment for an X-ray table, with foot stand 22 serving to support a patient in an upright manner longitudinally with respect to table top 2. In order to provide for the secure mounting of my improved platform accessory 6 on X-ray table 1, I have provided footrest assembly 20 with special bracket means in the form of fixed detent members 30 and 31 and pivotal bracket ears 32 and 33. Detent members 30 and 31 are spaced

upwardly from foot stand 22, and are constructed and arranged to restrainably engage inner, longitudinal side bar 10 of platform frame 8. Tubular section 10 of frame 8 is inserted between detent members 30—31 and the top of foot stand 22 in the manner shown in FIG. 3. In order to firmly lock frame 8 in place on footrest assembly 20, pivotal bracket ears 32 and 33 are swung downwardly into locking engagement with tubular section 10, as is shown with respect to bracket ear 32 in FIG. 3. With frame 8 resting on foot stand 22 in the arrangement shown in FIG. 3, support bar 18 will engage the outer, edge portions of foot stand 22, thereby elevating outer, side edge 12 of frame 8 with respect to inner edge 10 thereof. Frame 8 will thus be inclined from the horizontal with its nose portion 16 angled upwardly and outwardly from X-ray table top 2. This arrangement has the obvious advantage of minimizing the tendency of patients to roll off platform 6.

The position of frame 8 may be adjusted transversely with respect to X-ray table top 2 by simply pivoting bracket ears 32 and 33 upwardly (to the position in which ear 33 is shown in FIG. 3) out of locking engagement with tubular section 10, and then sliding frame 8 to the left or right as may be necessary to bring a particular portion of the body of a patient in front of the X-ray beam and in direct alignment with table 1. This lateral adjustment feature of frame 8 is particularly beneficial in permitting the radiologist to bring the area of interest of the patient to the desired position in front of X-ray table 1.

The assembly of my patient-supporting platform 6 is completed in the manner shown in FIG. 4 by placing pads or cushions 34 and 36 on top of frame 8. Pads 34 and 36 may be made of various materials such as plastic or wood, the primary requirement being that they be radiotranslucent and of such a density that they do not cast a shadow when interposed in the X-ray beam when an exposure is being made. In the preferred form of my invention, pads 34 and 36 are Styrofoam slabs having a total thickness of approximately 4 inches, and serve to support the patient's body above the opaque parts of frame 8 and footrest assembly 20. Ordinarily, mounting brackets 26 and 27 would be adjusted to a position along vertical, X-ray table 1 at about a waist-high level to permit a patient to easily and conveniently assume a reclining position on platform 6. If desired, table top 2 with platform 6 attached thereto may then be adjusted vertically by conventional power means (not shown) in order to adjust the position of the patient with respect to the X-ray beam. The X-ray film is inserted into a film holder, such as a Potter-Bucky diaphragm which slides into place between table top 2 and frame 4. The horizontal beam decubitus X-ray pictures may then be taken with the patient lying on platform 6. As noted above, the particular area of interest of the patient may be brought into proper alignment with the X-ray beam and X-ray film by sliding frame 8 laterally on foot stand 22 with pivotal bracket gears 32 and 33 unlocked.

Styrofoam pads 34 and 36 are preferably covered with a vinyl plastic sheet which is secured in place around pads 34 and 36 by nylon ropes tied through eyelets on the underside of the cover.

In FIGS. 5, 6 and 7, I have illustrated a modified version of my patient-supporting frame 8 wherein triangular-shaped brackets 38 and 40 are utilized to firmly attach frame 8 to an X-ray table. As may be noted with respect to FIGS. 5 and 6, the design, shape and construction of frame 8 is the same in this modification as was shown and described above with respect to FIGS. 1 through 4. Brackets 38 and 40 serve the dual functions of acting as support means for frame 8 and also inclining its outer edge 12 upwardly to assist in holding patients in place when X-ray pictures are being taken. Brackets 38 and 40 are of identical, triangular configuration, and as is clearly shown with respect to brackets 38 in FIG. 6, are comprised of a first leg 39 which is attached to frame 8 and a second, inclined leg 39 adapted to be secured to X-ray table top 2. Bracket leg 39 is firmly secured to the underside of one of the cross braces 14 of frame 8 by welding, or by bolts. When frame 8 is disposed in a horizontal position in the manner shown in FIG. 6, rear leg 41 of bracket 38 will be inclined rearwardly. Third leg 42 of triangular-shaped bracket 38 is connected between bracket legs 39 and 41. Frame 8 may be removably attached to X-ray table 1 by utilizing bolts 45 to secure rear bracket legs 41 to an intermediate bracket plate 44 attached to bracket clamps 26 and 27. As most clearly appears in FIG. 7, with bracket leg 41 mounted flush against bracket plate 44 and parallel to table top 2, frame 8 will be inclined upwardly and outwardly with outer edge 12 thereof elevated above inner, longitudinal side edge 10. This angular disposition of frame 8 will, of course, greatly restrict the rolling movement of a patient resting upon Styrofoam pads 34 and 36.

Those skilled in the art will readily appreciate that the above-described embodiments of my unique platform attachment for an X-ray table fulfill the need for a simple platform which may be quickly and easily removably mounted on a standard X-ray table for the taking of horizontal beam decubitus films. The combination of rigid, tubular metal frame 8 with mounting brackets 30—33 permits the safe and easy mounting of the patient-supporting platform on a support base as represented by foot stand 22 in FIG. 3. Fixed, detent brackets 30 and 31 are welded or riveted to the footrest assembly securely enough to support maximum stresses, and when properly attached will have the stressed tolerance of the foot stand 22 itself. The particular elevated disposition of detent brackets 30 and 31 with respect to foot stand 22 provide for the lateral shifting of frame 8 on its support base 22 in order that the desired area of interest of the patient may be brought in front of the X-ray beam and X-ray table 1.

The particular embodiments of my X-ray table attachment which I have described above are intended to be illustrative only. The same basic objectives of simplicity and safety for such an attachment may, of course, be realized by modifying my platform and mounting means in various ways. For example, other types of brackets than those shown as elements 30—33 may be employed to properly hold the platform in place while still permitting it to be adjusted laterally. I contemplate that various other changes may be made in the size, shape and arrangement of the various parts of my accessory platform for an X-ray table without departing from the spirit and scope of my invention as defined by the following claims.

What I claim is:

1. Patient-supporting apparatus in combination with an X-ray table having a planar top portion adjustable to an upright position, comprising:

base support means comprising a foot stand attached to said X-ray table and extending in a horizontal direction generally perpendicular to said planar top portion with said top portion adjusted to an upright position;

an elongated, body-supporting platform large enough to support a human body reclining thereon removably mounted on said foot stand and extending transversely to said planar top portion of said X-ray table in a plane generally perpendicular thereto, whereby, with said planar top portion of said X-ray table in an upright, vertical position said platform will lie in a substantially horizontal plane to receive a patient in a reclining position thereon; and

a support member interposed between the underside of said platform and the outer end of said foot stand remote from said X-ray table to thereby hold said platform in an inclined position with the outer, longitudinal edge of said platform at an elevated level above the inner, longitudinal edge thereof immediately adjacent said planar top portion of said X-ray table, whereby a patient lying on said platform is restrained against rolling movement away from said upright, planar top portion of said X-ray table; and further including a radiotranslucent, patient-supporting pad on top of said platform.

2. Patient-supporting apparatus in combination with an X-ray table having a planar top portion adjustable to an upright position, comprising: