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Chapa

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[54] **PATIENT POSITIONING DEVICE FOR THYROID EXAMINATION**

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[51] **Int. Cl.** **G01j 39/18**, G01t 1/20

[58] **Field of Search** 250/313, 314, 363, 366, 250/369, 451, 456, 491, 505

[56] **References Cited**

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3,025,397	3/1962	Travis et al.	250/456
3,112,402	11/1963	Okun et al.	250/505
3,329,814	7/1967	Anger	250/313
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FOREIGN PATENTS OR APPLICATIONS

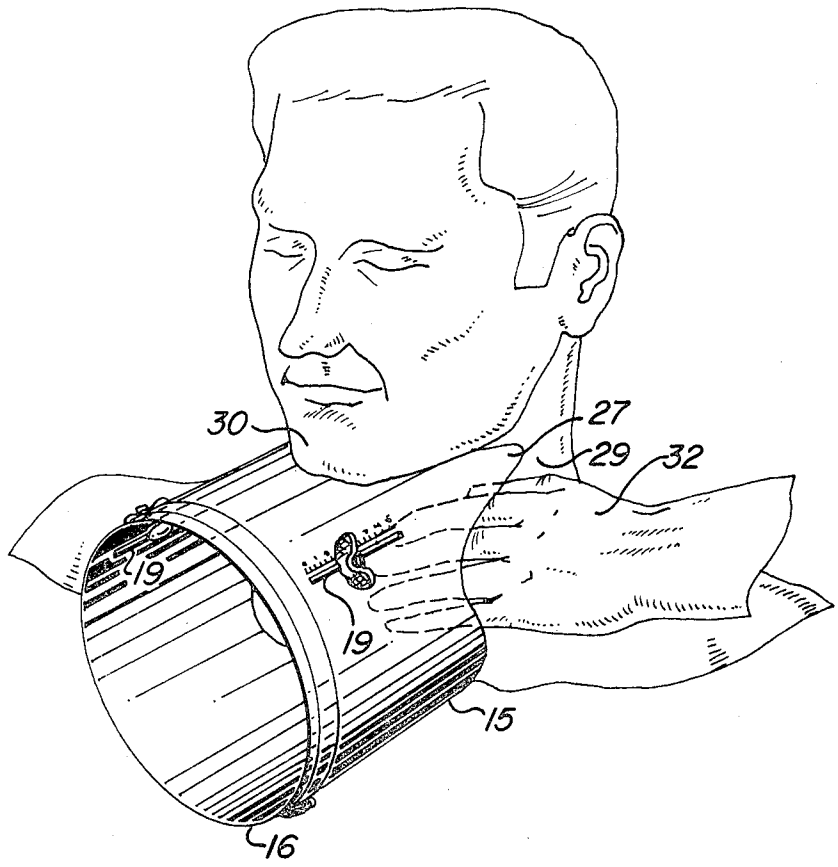
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[57] **ABSTRACT**

This specification discloses a device for positioning the neck of a patient relative to a positron camera with gamma ray detectors on which stereoscopic images are formed for examination of the thyroid gland of the patient. The device consists essentially of two telescopic, cylindrical members of plastic, a ring clamp for securing one of the telescopic members to the collimator of the camera, and means for securing the telescopic members in an adjusted relation. Calibrations are provided on one of the telescopic members which cooperate with an end edge of the other member to indicate the length of the device in an adjusted position. One of the telescopic members is formed with a recess at the top which receives the neck of a patient immediately below the chin and also with a pair of recesses at its opposite sides to accommodate the hands of an examining physician.

9 Claims, 3 Drawing Figures



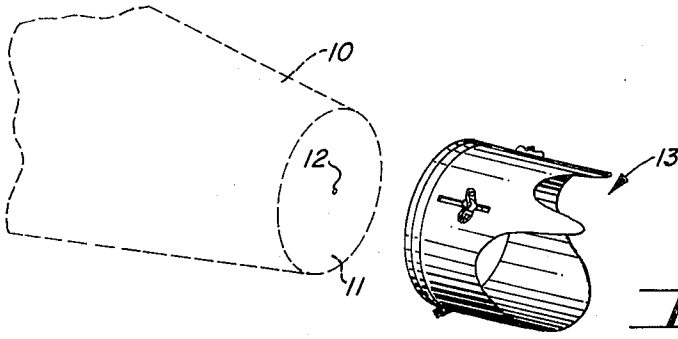


Fig-1

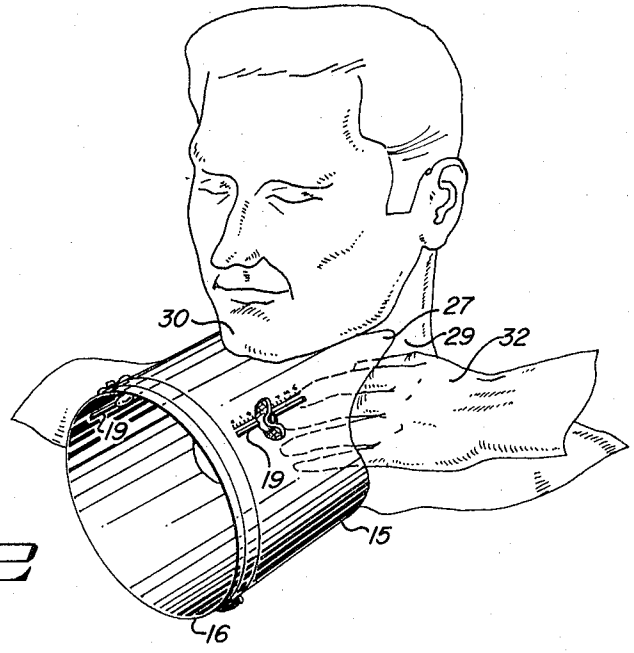


Fig-2

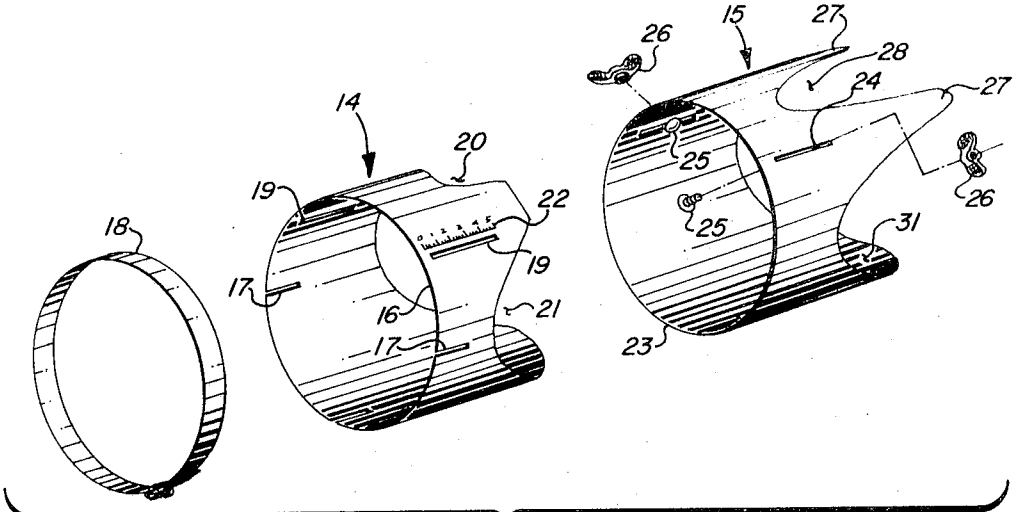


Fig-3

PATIENT POSITIONING DEVICE FOR THYROID EXAMINATION

The present invention relates to the examination of a thyroid gland by a nuclear medicine pho gamma scintillator camera and is concerned primarily with a device which accurately positions a patient relative to the collimator of the camera and provides access for the hands of an examining physician to the patient's neck to permit manipulation of the thyroid gland to bring it into proper relation with respect to the pho gamma rays which emanate from the pin hole of the collimator.

BACKGROUND OF THE INVENTION

At the present time, the practice of examining the thyroid gland of a patient by a nuclear medicine pho gamma scintillator camera is becoming more and more prevalent. One such camera which is identified as a positron camera in the patent to Anger, No. 3,329,814, includes gamma ray detectors on which stereoscopic images are formed. The camera also includes a collimator having a pin hole through which the pho gamma rays pass. It is believed to be highly desirable that a device be provided which will accurately position a patient, and particularly a patient's neck, relative to the camera, and at the same time provide for manipulation of the thyroid by the hands of an examining physician who stands behind the patient and views the images on the stereoscopic screen of the camera. The known art is singularly lacking in such a device.

OBJECTS OF THE INVENTION

With the foregoing conditions in mind, the present invention has in view the following objectives:

1. To provide a device for accurately positioning a patient relative to the collimator of a nuclear medicine pho gamma scintillator camera for the purpose of examining the thyroid gland.

2. To provide a device of the type noted which is adjustable to accommodate the physical characteristics of a particular patient and which includes means for securing an adjusted position of the device.

3. To provide a device of the character aforesaid which affords access to the hands of an examining physician standing to the rear of the patient for manipulation of the thyroid gland.

4. To provide a device of the kind described which includes a pair of cylindrical, telescopic, plastic members, one of which is identified as the base member and the other as the neck engaging member.

5. To provide, in a device of the type noted, means for clamping the base member to the free end of the collimator of a camera.

6. To provide, in a device of the character aforesaid, calibrations on one of the telescopic members which are susceptible of being read in conjunction with some structural element of the other member, such as an end edge thereof, to indicate the axial length of the device in an adjusted position.

7. To provide, in a device of the kind described, guide means for maintaining the telescopic members in angular alignment during axial adjustment thereof, together with means for locking the members in an adjusted position.

8. To provide, in a device of the type noted, a neck engaging member having a pair of tongues at the end remote from that which is received in the base member and which define a recess which receives the neck of a patient immediately beneath the chin.

9. To provide, in a device of the character aforesaid, a neck engaging member having diametrically opposed recesses at the sides thereof on the end remote from that which is received in the base member and which accommodate the hands of an examining physician standing in back of the patient.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above ideas in a practical embodiment, will in part become apparent and in part be hereafter stated as the description of the invention proceeds.

SUMMARY OF THE INVENTION

The foregoing objects are achieved by providing a device comprising a cylindrical base member of plastic having an outer end edge onto which open a plurality of slots, with this end of the base member being designed to fit over the free end of the collimator of a nuclear medicine pho gamma scintillator camera, together with a ring clamp which secures the base member in fixed position on the collimator. The end of the base member remote from that which is secured to the collimator is formed with a recess at the top and diametrically opposed recesses at the sides for a purpose to be later described. It is also formed with a pair of longitudinally extending slots, with calibrations along the side edge of at least one of these slots.

A neck engaging cylindrical member of plastic is telescopically received within the base member and has an inner edge which cooperates with the calibrations aforesaid. The neck engaging member is also formed with longitudinally extending slots which align with the slots in the base member. Set screws pass through the aligned slots and carry wing nuts which may be tightened to secure an adjusted relation of the base and neck engaging members or loosened to permit adjustment. The end of the neck engaging member remote from the inner end edge is formed at its upper region with a pair of tongues which define a recess that receives the neck of a patient immediately beneath the chin. When the two telescopic members are in a collapsed condition, the inner end portion of this recess underlies or aligns with the recess in the top of the base member.

The neck engaging member is also formed with a pair of diametrically opposed recesses at the sides which open onto the outer end thereof and which are dimensioned to accommodate the hands of an examining physician for thyroid manipulation purposes. When the telescopic members are collapsed, the inner portions of these side recesses also coincide with the recesses in the sides of the base member.

For a full and more complete understanding of the invention, reference may be had to the following description and the accompanying drawing wherein:

FIG. 1 is a perspective illustrating a portion of the collimator of a nuclear medicine pho gamma scintillator camera and the patient positioning device of this invention in exploded relation;

FIG. 2 is another perspective depicting the upper portion of a patient, the neck engaging member of the subject positioning device, and the hand of an examining physician, and

FIG. 3 is a perspective illustrating the elements of the subject device in exploded relation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing wherein like reference characters denote corresponding elements throughout the several views, and first more particularly to FIG. 1, the end portion of a collimator of a nuclear medicine pho gamma scintillator camera is illustrated in phantom and designated 10. While it is believed that the subject device is susceptible of use with any nuclear medicine pho gamma scintillator camera now available to the public, the invention has particularly in mind its use with the positron camera with gamma ray detectors on which stereoscopic images are formed, such as is fully disclosed in the aforementioned patent to Anger. The collimator 10 is ordinarily made of lead and is frusto-conical, having an end wall 11 formed with a pin hole 12 at the center thereof. A patient positioning device embodying the precepts of this invention is generally designated 13. It is intended that this device 13 be detachably mounted on collimator 10 immediately adjacent to end wall 11.

Referring now more particularly to FIG. 3, the device 13 is shown as including two basic elements in the form of two cylindrical, telescopic members designated generally 14 and 15. These members are of a plastic having the property of flexibility to a noticeable degree, but they also have the property of rigidity to a marked degree. Acrylic is one example of such a plastic.

The member 14 is herein identified as the base member and is the outer of the two telescopic members. Thus, the member 15 is identified as the neck engaging member and is telescopically received within member 14.

Base member 14 presents an end edge 16 into which open a plurality of slots 17. When the device 13 is to be mounted on collimator 10, the end 16 of base member 14 is fitted about the conical wall of collimator 10 immediately adjacent end wall 11, with the slots accommodating such fitting. A ring clamp 18 is then positioned over the end portion of base member 14 and tightened to secure the assembled relation.

The cylindrical wall of base member 14 is formed with two longitudinally extending slots, one of which is shown at 19 in FIG. 3. These slots are in what might be called the upper region of the base member when device 13 is in an effective position and are angularly spaced apart a distance of about 120°. The end of base member 14 remote from edge 16 is formed with a recess 20 in the area between slots 19 for a purpose to be later described. It is also formed at each side with a recess 21 which opens onto this same end. The recesses 21 are diametrically opposed and their purpose will later become apparent. A series of calibrations 22 are inscribed on the outer surface of the cylindrical wall of base member 14 adjacent to one or both of the slots 19.

Neck engaging member 15 has an inner end 23 which is received in base member 14. It is formed with two longitudinally extending slots 24 which are angularly spaced apart a distance corresponding to the annular spacing of slots 19 in base member 14. When the members 14 and 15 are assembled, slots 19 and 24 align and a headed screw 25 is passed through each pair of aligned slots. The stems of these screws project outwardly beyond the contour of base member 14 and screwed thereonto are wing nuts 26 which may be tightened to secure an adjusted relation or loosened to permit adjustment of members 14 and 15. It is evident that the inner edge 23 cooperates with calibrations 22 when members 14 and 15 are assembled to indicate the effective axial length of device 13. The end of neck engaging member 15 remote from inner edge 23 is formed with a pair of tongues or tabs 27, portions of which align with slots 24. Thus, these tongues 27 define a recess 28 in the upper region of base member 15. Moreover, when the members 14 and 15 are in a collapsed or partially collapsed condition, the inner portion of recess 28 will coincide with recess 20 in base member 14.

Referring now for the moment more particularly to FIG. 2, it will be noted that the neck of a patient is shown at 29 and the chin of this patient at 30. In effective position, and with the members 14 and 15 assembled, recess 28 receives the neck 29 just beneath chin 30.

Referring now again to FIG. 3, neck engaging member 15 is formed with a pair of diametrically opposed recesses 31 at the sides. Recesses 31 are dimensioned so that when device 13 is in effective position, openings are provided at opposite sides to enable a physician to pass his hands therethrough and thus manipulate the thyroid gland of the patient. This condition is depicted in FIG. 2, with one hand of an examining physician being shown in phantom at 32.

OPERATION

While the manner in which the subject patient positioning device is used is believed to be obvious from the illustration of the drawing and description of parts set forth above, it might be briefly described as follows:

Members 14 and 15 are first assembled in telescopic relation, set screws 25 passed through aligned slots 19 and 24, and wing nuts 26 partially tightened to maintain the assembled relation. End 16 of base member 14 is now fitted over the end of collimator 10 and ring clamp 18 tightened to secure the assembled relation. With the patient sitting in a chair, the sections 14 and 15 are axially adjusted to a required length and wing nuts 26 tightened to secure the adjusted relation. The patient will now have assumed the position depicted in FIG. 2. The examining physician stands behind the patient and passes his hands through recesses 31 to manipulate the thyroid gland to bring it or any portion thereof into proper alignment with the rays passing through the pin hole 12. With the camera in operation, the physician can view the stereoscopic images formed on the detectors of the camera.

While a preferred specific embodiment is herein disclosed, it is to be clearly understood that the invention is not to be limited to the exact constructions, materials and devices illustrated and described, because various modifications of these details may be provided in putting the invention into practice.

What is claimed is:

1. In a device for positioning a patient relative to a nuclear medicine pho gamma scintillator camera including a collimator, for thyroid gland examination purposes:

a. a cylindrical, plastic base member having opposed ends;

b. means for detachably mounting one end of said base member on said collimator;

c. a cylindrical, plastic neck engaging member in telescoping relation to said base member and having an inner end edge and an outer end;

d. means for maintaining said base member and neck engaging member in angular alignment during axial adjustment thereof;

e. means for securing an axially adjusted position of said base and neck engaging members;

f. said neck engaging member being formed with a recess in what is the upper region of said neck engaging member when the device is in effective position and which recess receives the neck of a patient, and

g. said neck engaging member being formed with a pair of recesses at the opposite sides thereof which are dimensioned to permit the passage of the hand of an examining physician therethrough when the device is in effective position.

2. The device of claim **1**, together with calibrations on one of said members which cooperate with a structural element on the other of said members to indicate an adjusted axial length of said members when assembled.

3. The device of claim **1** in which the end of said base member which is mounted on the collimator is formed with a plurality of angularly spaced slots opening onto the end edge thereof, together with a ring clamp disposed about the slotted end of said base member and constituting the means for mounting the base member on the collimator.

4. The device of claim **1** in which the means for maintaining the base member and neck engaging member in angular alignment comprises a pair of longitudinal slots formed in said members and which align, together with a set screw passing through each pair of aligned slots and a nut on each set screw.

5. The device of claim **4** in which the neck engaging member is received within the base member and calibrations on the outer surface of said base member along the sides of one of said slots, and which calibrations cooperate with the inner end edge of said neck engaging member in indicating the effective length of the device in an adjusted position.

6. The device of claim **4** in which said slots are angularly spaced apart about 120°.

7. The device of claim **1** in which said base member is formed with a recess opening onto the end remote from that which is secured to the collimator and which recess is in alignment with the recess in the top of the neck engaging member, and recesses at the sides of said base member opening onto the end remote from the end which is secured to the collimator, said last mentioned recesses being in alignment with said recesses in the sides of said neck engaging member.

8. The device of claim **1** in which said base member and said neck engaging member are of acrylic.

9. The device of claim **1** in which the recess in the top region of the neck engaging member is defined by a pair of tongues which are positioned beneath the chin of a patient when the neck of that patient is received in the recess defined by the tongues.

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