

Nov. 15, 1966

J. I. PRETTO

3,286,094

RADIATION ENERGY SHIELD PROTECTING A BODY AREA OF
A PATIENT FROM X-RAYS AND THE LIKE
Original Filed March 20, 1961

Fig. 1.

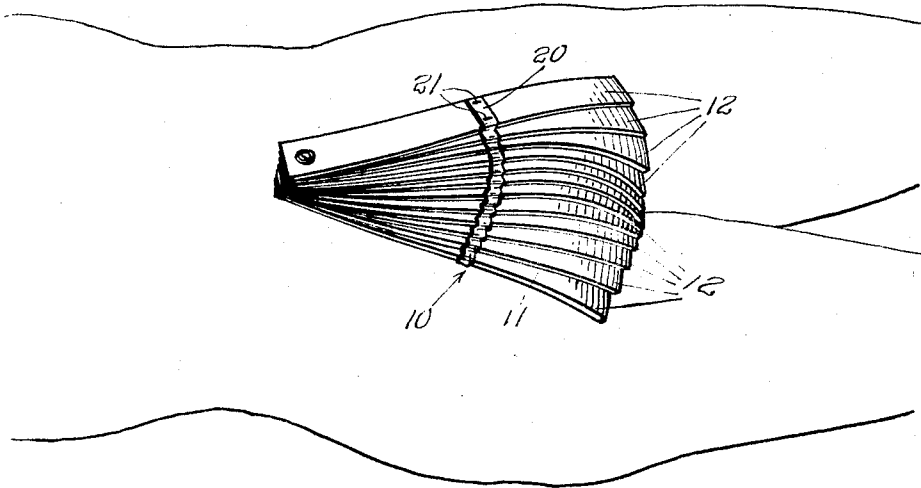


Fig. 3.

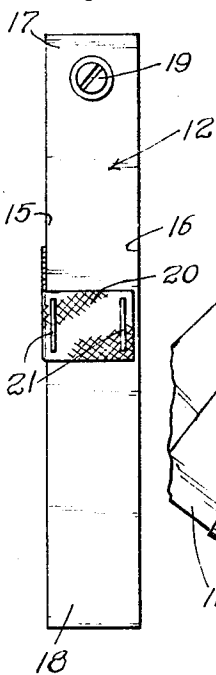


Fig. 2.

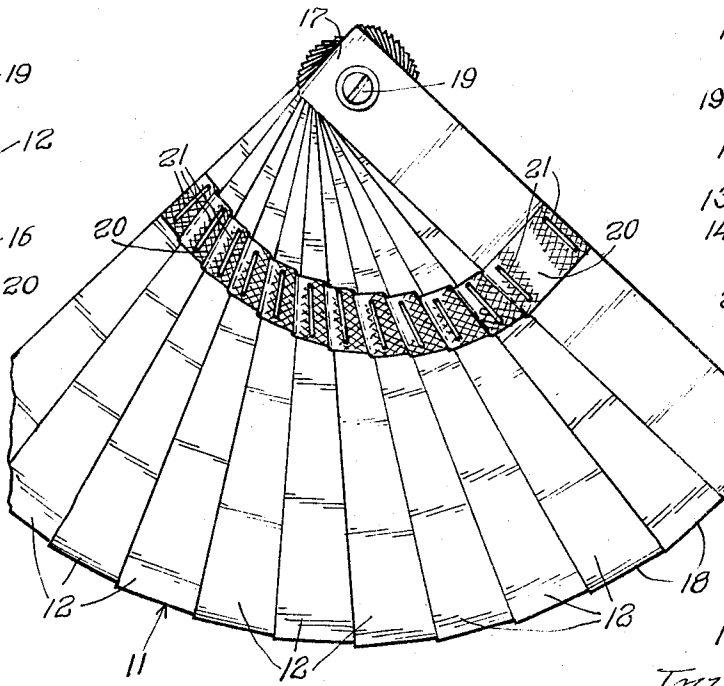
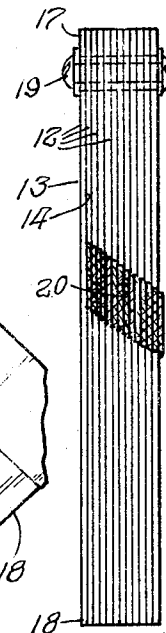


Fig. 4.



Inventor:
John I. Pretto,
By *Hofgren, Brady, Wegner,
Allen, Stelman, Attys.*

1

3,286,094

RADIATION ENERGY SHIELD PROTECTING A BODY AREA OF A PATIENT FROM X-RAYS AND THE LIKE

John I. Pretto, P.O. Box 580, Las Vegas, Nev.
Continuation of application Ser. No. 97,227, Mar. 20, 1961. This application Mar. 24, 1964, Ser. No. 357,343
1 Claim. (Cl. 250-108)

This application is a continuation of my application Serial No. 97,227, filed March 20, 1961, now abandoned.

This invention relates to a radiation energy shield, and more particularly to such a shield for use in protecting the gonadal area of a patient during exposure to ionizing radiation as from X-ray examination or treatment.

In both the medical and the lay field much concern has been shown about the ultimate genetic effect of cumulative exposure to ionizing radiation energy rays, particularly through X-ray examination and treatment. At the same time, however, the number of diagnostic radiographs of the gonadal area is increasing without adequate patient protection. The lack of suitable shielding devices for use in making such radiographs is obvious. Various shields have been proposed, but they have received little acceptance and apparently are not in general use.

The shield to which this invention is directed has been tested and used successfully for both mean and women patients and children of all ages. It is particularly versatile in that it may be safely adjusted within a wide range of size requirements, and is so constructed that it is extremely flexible for conforming to varying configurations of the gonadal area, and it is a practical mechanical solution to the problem of protection for a patient from ionizing radiation, as roentgen rays.

It is, therefore, a primary object of this invention to provide an improved shield from ionizing radiation energy. A related object of the invention is the provision of such a shield which is universal in nature in that it may be adjusted to various sizes and easily conforms to various configurations of the body.

A feature of the invention is the provision of a shield having a substantially flat body portion of material opaque to ionizing radiation energy which may be expanded or contracted for varying the width of the body portion.

Another feature of this invention is the provision of a universal shield for conforming to various configurations and sizes of portions of a patient's body to be shielded, the shield having a plurality of substantially identical, thin, flexible leaves of a material opaque to ionizing radiation energy and arranged in overlapping, face-to-face, substantially co-extensive relationship in a compact position with a pin extending through adjacent ends of the leaves for maintaining the leaves in abutting relationship and mounting the leaves for relative lateral face-to-face rotational movement to intermediate positions between the compact position and a fully extended position in which the leaves are in fan-like arrangement, so that the width of the shield may be varied in keeping with the size of the portion of the patient's body to be shielded, and with each leaf tending to conform to the configuration of the immediately adjacent portion of the patient's body, and in which the lateral movement of the leaves is limited by a flexible strip to maintain each leaf in face-to-face overlapping relationship when the shield is in the fully extended position.

Additional features and advantages will be apparent from the following description and drawing, in which:

FIGURE 1 is a perspective view illustrating the shield in an intermediate position and resting on and covering the gonadal area of a patient;

2

FIGURE 2 is a facial view of the shield in the fully extended position;

FIGURE 3 is a facial view of the shield in the compact position; and,

FIGURE 4 is a side view of the shield in the compact position.

The invention is directed to a universal shield for protection from ionizing radiation in which leaves of a material opaque to such energy are secured together by a pin passing through an end of the leaves for varying the width of the shield by disposing the leaves in fan-like arrangement suited to various sized body portions. The shield rests on the patient's body and the leaves, which are flexible or preferably limp, conform with the configuration of the immediately adjacent portion of the body, and the entire shield closely conforms with the overall configuration of the portion of the patient's body on which it is resting. Certain types of ionizing radiation, as alpha or beta radiation and X-rays may be absorbed or blocked by suitable materials, as lead, and the shield is of a material suitable for the radiation involved.

Referring to the drawings, the shield 10 has a body portion 11 including a plurality of leaves 12 in the form of substantially identical, thin, flexible or preferably limp strips of a suitable material opaque to ionizing radiation energy, such as a lead impregnated rubber material. The flexible or limp nature of the leaves permits each leaf and the shield as a whole to conform to the adjacent portion of the patient's body. Each leaf 12 has opposite faces 13 and 14 with opposite side portions 15 and 16, and opposite ends 17 and 18. A suitable fastener, such as a nut and bolt 19, extends through aligned apertures in one of the opposite ends 17 of the leaves and provides means for maintaining the leaves in overlapping relationship and mounting the leaves on an axis for relative lateral face-to-face rotational movement to intermediate positions, as illustrated in FIGURE 1, between a compact position, as illustrated in FIGURES 3 and 4, and a fully extended position, as illustrated in FIGURE 2. In the compact position, illustrated in FIGURES 3 and 4, the leaves 12 are in face-to-face, overlapping, substantially co-extensive relationship with the opposite ends 17 and 18 of each leaf respectively aligned. A flexible strip, such as a suitable strip of cloth 20, is secured to corresponding side portions 15 of each strip, in any suitable manner such as by a staple 21, providing means for limiting lateral movement of the leaves to maintain each leaf in face-to-face overlapping relationship with the adjacent leaves when the shield is in the fully extended position as illustrated in FIGURE 2. More particularly, the staples 21 are secured through the strip 20 and respective side portions 15 of the leaves 12 so that each side portion 15 of face 13 is in overlapping face-to-face relationship with side portion 16 of face 14 of the adjacent leaf 12. The staples and their openings in the leaves are in overlapping relationship with an adjacent leaf to assure full protection from damaging rays.

The shield 10 is truly universal in nature in that the width of the body portion 11 may be expanded or contracted to various sizes and is flexible and automatically conforms to the configuration of the patient's body on which it is resting. A simple, easily constructed, inexpensive, gonadal shield which can be applied to any patient of either sex in any age group is provided. It is easily portable, placed, and adjusted by a technician, and affords adequate gonadal protection for radiological procedures. The shield may obviously be used for protecting areas of the body other than the gonadal area, as well as any suitable object.

While I have shown and described certain embodi-

3

ments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claim.

I claim:

An ionizing radiation shield conformable to configurations and sizes of portions of a patient's body to be shielded, consisting of: a plurality of elongated leaves of a limp material, opaque to X-rays, each of said leaves having a width greater than the thickness thereof and each having a hole therethrough adjacent one end thereof extending in the direction of minimum thickness of the leaf, said leaves being otherwise imperforate; a common pivot pin extending through the holes of said leaves, plugging the holes, securing the leaves face-to-face in a stacked relation, said leaves being independently movable about said pivot pin from a compact position with the leaves aligned to an extended position with the leaves fanned apart; a flexible, inextensible member extending generally transversely of said leaves; and means at a

4

point intermediate the ends of each leaf for securing said inextensible member to each leaf, the length of said inextensible member between adjacent leaves being less than the width of the leaf, maintaining the leaves in an overlapping relation with said member fully extended, thereby presenting a continuous and imperforate fanned shape opaque to X-rays.

References Cited by the Examiner

UNITED STATES PATENTS

902,633	11/1908	Wigand et al.	230—269
2,718,598	9/1955	Graf	250—108
2,857,525	10/1958	Ferdon	250—108

FOREIGN PATENTS

8,667 8/1932 Australia.

RALPH G. NILSON, *Primary Examiner.*

J. W. LAWRENCE, S. ELBAUM, *Assistant Examiners.*