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X-RAY FILM EXPOSURE HOLDER

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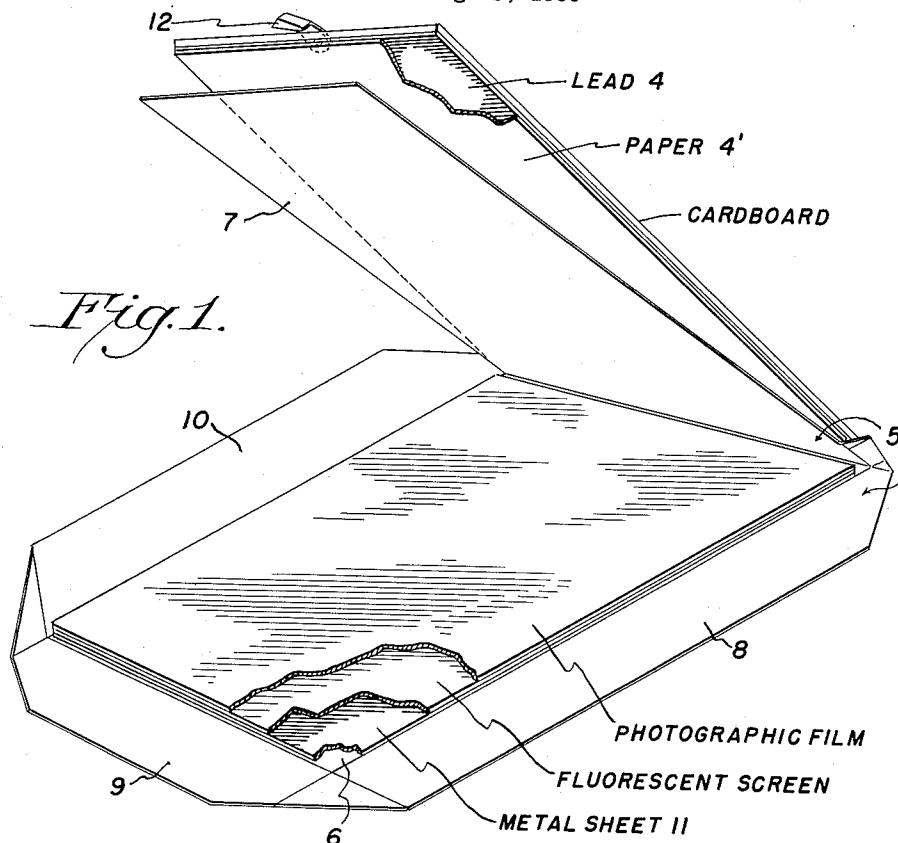
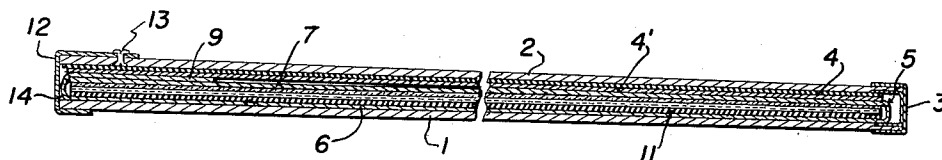


Fig. 2.



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X-RAY FILM EXPOSURE HOLDER

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3 Claims. (250—68)

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This invention relates to an improved X-ray film exposure holder. More particularly it relates to such a holder which will provide improved contact between an X-ray intensifying screen and an X-ray sensitive film element.

X-ray film exposure holders are used quite extensively in the art of radiology because they are light in weight and relatively small in size. They have the disadvantage, however, that it is difficult to obtain firm uniform contact between the light-sensitive layer or layers of the X-ray film element and the surface of the X-ray intensifying screen or screens and for this reason screens are rarely used in such holders.

An object of this invention is to provide an improved X-ray film exposure holder. A further object is to provide such a holder which gives good uniform contact between an X-ray intensifying screen and a light-sensitive film element. A further object is to provide such a holder which is simple in construction and economical to make. A still further object is to provide such a holder which can be successfully used by the ordinary technician. Still other objects will be apparent from the following description of the invention.

The improved X-ray film exposure holders of this invention will be explained with reference to the accompanying drawing which constitutes a part of this specification. In the drawing Fig. 1 is a perspective view of an opened assembled holder with parts broken away and parts in section and Fig. 2 is a sectional view of a closed holder with parts broken away.

Referring to the drawing, the holder consists of two cover sheets of cardboard or other lightweight, inexpensive material which constitute a front 1 and a back 2. The front and back members are joined along one edge with a flexible hinge such as a piece of tape 3. The inside of the back cover is provided with a sheet of material 4 which is impervious to X-rays such as a lead sheet. The front cover sheet has a paper envelope 5 which consists of sheet 6 which is substantially co-extensive in area with the front and back covers which is folded along the upper edge to form a large flap 7 substantially co-extensive in area with the back cover 2. Three small flaps 8, 9 and 10 are disposed around the three remaining sides. When the flaps are closed they form a light-proof envelope which is adapted to receive one or more light-sensitive film elements and one or more X-ray intensifying screens and the novel magnet-responsive metal sheet 11.

The magnet-responsive sheet should be rela-

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tively thin so that it will allow X-rays freely to pass through and excite the fluorescent or X-ray intensifying screen and expose the light-sensitive film element. It is placed on the bottom of the envelope 6, an X-ray intensifying screen is placed on the magnet-responsive sheet, an X-ray film is placed on the screen, another X-ray intensifying screen may be placed on the film element and flap 7 and flaps 8, 9 and 10 are folded down to completely enclose the assembly in a light-proof envelope. The back cover member is then folded down and fastened to the front cover by any suitable fastener such as the clip 12 which is pivoted on one cover by means of pin 13 and has a channel portion 14 which fits over the edges of the covers. One, two or more X-ray intensifying screens can be used with one or more film elements with the magnet-responsive sheet if desired.

In making an X-ray exposure the X-ray film exposure holder is subjected to a magnetic field just prior to and during an X-ray exposure. The field is disposed on the back of the holder and pulls the magnet-responsive sheet and the X-ray intensifying screens into firm uniform contact with the film and the back of the holder. This insures good and uniform contact between the light-sensitive surface or surfaces of the film and the surface of the contacting X-ray intensifying screen or screens.

It is generally desirable to cover the lead, etc., sheet with a thin sheet of dark paper 4' to prevent light-reflections and protect the lead surface from being scarred. The back and front covers of the holder as well as the envelope should not transmit any light rays which would expose the X-ray film in the holder.

The holders can, of course, be used in a cassette tray on a radiographic table which is provided with a magnet and circuits for generating a magnetic field and making an X-ray exposure as shown in my related application entitled cassettes, Serial No. 177,385, filed on an even date herewith. The combination holders can be used in stereoscopic exposure apparatus and because of their lightness of weight have obvious advantages in that the shifting devices can be of a lighter construction and a shift can be accomplished in a shorter time interval.

An advantage of this invention is that it provides a simple and effective X-ray film exposure holder which gives exposures evidencing good contact. The resulting radiographs show uniform contact equal to that obtained with expensive heavy cassettes. Another and an im-

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portant advantage is that the holders are light in weight which means that the technician can carry a large number of the holders as compared with two or three cassettes (e. g., a 14 x 27 cassette weighs approximately 9.5 pounds). A further advantage is that they are economical to manufacture.

As many widely different embodiments of this invention can be made without departing from the spirit and scope thereof, it is to be understood that the invention is not to be limited except as defined by the claims.

What is claimed is:

1. An X-ray exposure holder comprising a folder hinged at one end and having a back cover which is provided with a sheet of material which is impervious to X-rays and a front member which has a foldable envelope secured to its inner surface, said envelope including a large upper flap and three small side flaps which are adapted to fold inwardly to form a light-proof envelope in combination with a separate, unattached, magnet-responsive sheet permeable to X-rays disposed in the envelope; and means for locking the cover members in operative position.

2. An X-ray exposure holder comprising a cardboard folder, hinged at one end and having a back cover provided with a sheet of lead and a protective paper on its inner surface and a front cover having a foldable envelope secured to its inner surface, said envelope including a large upper flap and three small flaps which are adapted to fold inwardly and form a light-proof envelope for a light-sensitive film element and a co-active fluorescent screen, in combination

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with a separate, unattached, magnet-responsive sheet permeable to X-rays disposed in said envelope and having a surface area substantially the same as that of said envelope; and means for locking said cover members in operative position.

3. An X-ray exposure holder comprising a cardboard folder hinged at one end and having a back cover which has adhesively secured to its inner surface a sheet of lead having its surface protected by a paper sheet, a front cover having a foldable paper envelope adhesively secured to its inner surface, said envelope including a large upper flap and three small flaps which are adapted to fold inwardly and form a light-proof envelope for a light-sensitive film element and at least one co-active X-ray intensifying screen; in combination with a separate, unattached, thin ferrous metal sheet permeable to X-rays disposed in said envelope, and a clip for fastening the cover members in operative position.

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