Aug. 18, 1953 G. L. LOTT 2,649,547

RADIOGRAPH MARKING APPARATUS

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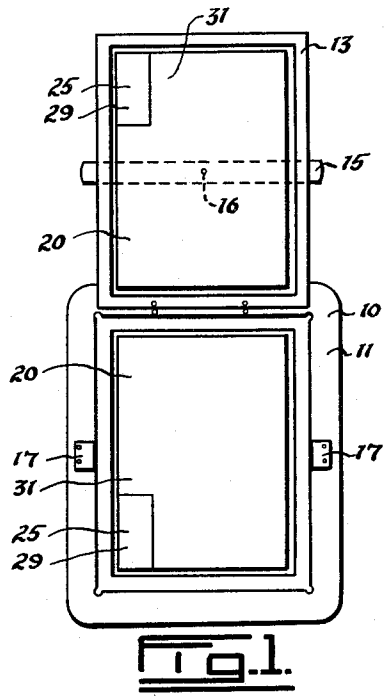


Fig. 1.

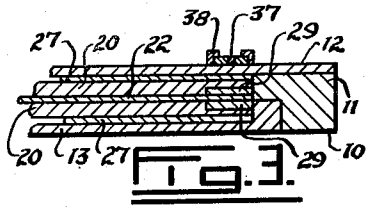


Fig. 3.

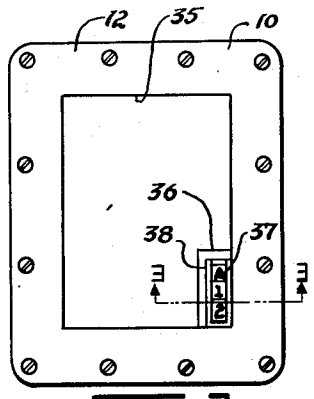


Fig. 2.

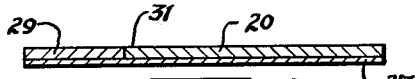
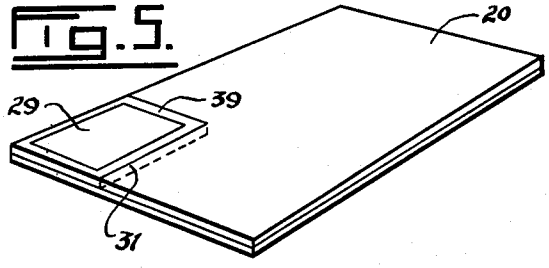


Fig. 4.

Fig. 5.



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RADIOGRAPH MARKING APPARATUS

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6 Claims. (Cl. 250—67)

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This invention relates to improved apparatus for marking radiographs.

In making radiographs, a radiograph film or plate is placed in a cassette between the adjacent contact faces of two fluorescent screens. When X-rays are directed on to the screens, the latter convert said X-rays into actinic rays. Some of the X-rays are converted at the first screen while others are transmitted therethrough and converted at the second screen. Both the X-rays and the actinic rays produce a shadowgraph of varying degrees of any object placed between the source of the X-rays and the film or plate.

It is well-known that at the present time markings and identifications on X-ray films are blackened out almost beyond recognition when high voltages are used for making radiographs of thick parts of the human anatomy. It has been discovered that it is not the high voltage which is responsible for obliterating the markings, but an excess amount of actinic rays produced by the fluorescent screens.

An object of the present invention is the provision of apparatus in which radiographs may be clearly marked without danger of the markings being obliterated when high voltages and dosage are used.

Another object is the provision of apparatus in which a radiograph may be clearly marked without affecting the contact between the film and the fluorescent screens.

Another object is the provision of radiograph apparatus in which an area is kept free of actinic rays in order that identifying indicia located outside the cassette may be reproduced on the film without danger of obliteration.

Yet another object is the provision of radiograph apparatus including an area therein free of actinic rays and having identifying indicia outside the apparatus in which it is impossible for said area and indicia to get out of line with each other, or for either of these to interfere with the shadowgraph of the object being radiographed.

Examples of the radiograph marking apparatus are illustrated in the accompanying drawings, in which,

Figure 1 is an elevation of an open cassette,

Figure 2 is an elevation of a closed cassette showing the surface thereof which faces the source of the X-rays,

Figure 3 is a fragmentary section taken on the line 3—3 of Figure 2,

Figure 4 is an end view of a fluorescent screen incorporating one form of the invention, and,

Figure 5 is a perspective view of a screen showing another form of the invention.

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Referring to Figures 1 and 2, 10 is a cassette of well-known construction. This cassette consists of a metallic frame 11 having a wall 12 formed of suitable material, such as Bakelite, secured to one face thereof, and a metallic cover 13 hingedly mounted on its opposite face. Suitable means is provided for locking the cover in closed position. This may be in the form of a bar 15 hingedly mounted at 16 to the outer surface of the cover and adapted to extend beyond opposite sides thereof, as clearly shown in Figure 1. When the cover is closed, this bar is swung into a position with its opposite ends beneath lugs 17 mounted on opposite sides of the frame to hold the cover in closed position.

Two fluorescent screens 20 are located within the cassette, one against the inner surface of the wall 12 and one against the inner surface of the cover 13. These screens are secured in place in any convenient manner so that they are separated when the cover 13 is opened. When the cover is closed, the adjacent surfaces of the screens come together and are adapted to contact a radiograph film or plate 22 which has been inserted in the cassette. The apparatus described so far is well-known and is in common use today.

Each of the fluorescent screens 20 is formed with a defluorized area 25, the area of one screen being in line with the corresponding area of the other screen when the cover 13 of the cassette is closed. It is desirable that the area of each screen be located at a corner thereof and extend into the screen some distance from each of the two sides at said corner.

The defluorized area may be formed by cutting away a portion of the screen at the desired point. This area may be left vacant, but it is preferably filled with or covered by a block of material which is impervious to actinic rays.

Fluorescent screens used in these cassettes are usually provided with a backing 27 formed of a cardboard composition, see Figure 4. These backings are located on the surface of the screen which is remote from the radiograph film when the cassette is closed.

In forming the defluorized area 25, the crystals in the screen in this area may be removed to form a recess extending part way through the screen, or completely through the screen, as illustrated in Figure 4. This recess is filled with a block 29 of any suitable material which is impervious to actinic rays and which will permit X-rays to pass therethrough. This block may be formed of a composition consisting of wood fibre and plastic material dyed black, or may be any other suit-

able black material, such as paint or paper. It is highly desirable that the block be built up so that its outer surface is flush with the surface 31 of the screen which comes into contact with the film. This eliminates the possibility of defective screen and film contact.

The wall 12 of the cassette may be marked as at 35 to indicate the boundary of the fluorescent screens. It may also be marked as at 36 to indicate the position of the defluorized areas of the screens. Suitable identifying indicia 37, such as numbers and/or letters, are placed on the outside of the cassette within the area bounded by the lines 35 and 36, where they are located over the defluorized areas or impervious blocks of the screens. These indicia are formed of any suitable material, such as lead, which is opaque to X-rays. The indicia may be retained in position in any convenient manner, such as by means of a frame 38.

In operation, a radiograph film is placed in the cassette and the cover 13 thereof closed, so that said film is between and in contact with the inner surfaces of the fluorescent screens 20. The desired identifying indicia 37 are placed on the outside of the cassette in the area bounded by the lines 35 and 36. This means that the indicia are in line with the aligned impervious blocks 29 of the screens. When X-rays are directed through the object to be radiographed to the cassette, such as a part of the human body, the denser parts thereof will form a shadowgraph on the film. At the same time, the indicia will be clearly marked on the film because the X-rays cannot pass through them. The indicia cannot be burned out since the impervious blocks 29 prevent the actinic rays from entering the defluorized area. Thus, no matter how high the voltage or dosage used or the amount of secondary rays involved, the indicia will be quite clear. There is no danger of defluorized areas moving from their proper positions in line with the indicia, and there is absolutely no danger of either the indicia or defluorized areas interfering with the shadowgraph as said indicia and areas are fixed relative to the radiograph film.

The defluorized area in each screen may be formed by securing a very thin layer of black material, such as paper, to the surface of the screen at the desired point, or by covering said area with black paint. This makes the covered portion of the screen inactive as far as the actinic rays are concerned. If the covering is kept thin enough, it will not materially interfere with the contact between the screen surfaces and the film.

Figure 5 illustrates a fluorescent screen 20 having an impervious block 29, as described above. However, a barrier 39 surrounds the block and is flush with the contact surface of the screen. This barrier is formed of a material, such as lead, which is impervious to both actinic and X-rays. The barrier prevents any rays which may be travelling substantially horizontally from reaching the defluorized areas. If desired, the barrier may be used without the block.

Some results have been obtained by forming a defluorized area in the back screen only, that is, in the screen which is farthest from the source of X-rays. While the impervious blocks in both screens may be formed of material impervious to actinic rays, but which will permit the passage of X-rays, it is to be understood that the block in the back screen may be impervious to both rays. In this case, it may be formed of a material such as lead.

What I claim as my invention is:

1. In radiograph apparatus, a cassette, two fluorescent screens within the cassette between which a radiograph film may be placed, a block impervious to actinic rays formed in each screen, said blocks being in line with each other, and identifying indicia on the outside of the cassette formed of material opaque to X-rays, said indicia being located over the impervious blocks of the screens.

2. In radiograph apparatus, a cassette, two fluorescent screens within the cassette between which a radiograph film may be placed, a block impervious to actinic rays formed in each screen flush with the surface thereof which comes into contact with the film, said blocks being in line with each other, and identifying indicia on the outside of the cassette formed of material opaque to X-rays, said indicia being located over the impervious blocks of the screens.

3. In radiograph apparatus, a cassette, two fluorescent screens within the cassette between which a radiograph film may be placed, a block impervious to actinic rays formed at a corner of each screen and extending into the screen some distance from each of the two sides at said corner, said blocks being in line with each other, and identifying inidicia on the outside of the cassette formed of material opaque to X-rays, said indicia being located over the impervious blocks of the screens.

4. In radiograph apparatus, a cassette, two fluorescent screens within the cassette between which a radiograph film may be placed, each screen being formed with a defluorized area which is in line with the corresponding area of the other screen, and identifying indicia on the outside of the cassette formed of material opaque to X-rays, said indicia being located over the defluorized areas of the screens.

5. In radiograph apparatus, a cassette, two fluorescent screens within the cassette between which a radiograph film may be placed, a block impervious to actinic rays formed in each screen flush with the surface thereof which comes into contact with the film, said blocks being in line with each other, a barrier in each screen surrounding its block flush with the contact surface thereof, said barriers being formed of material impervious to both actinic rays and X-rays, and identifying indicia on the outside of the cassette formed of material opaque to X-rays, said indicia being located over the impervious blocks of the screens.

6. In radiograph apparatus, a fluorescent screen having a block impervious to actinic rays formed therein flush with the surface thereof adapted to be brought into contact with a radiograph film, and a barrier in the screen surrounding its block flush with the contact surface thereof, said barrier being formed of material impervious to both actinic rays and X-rays.

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