

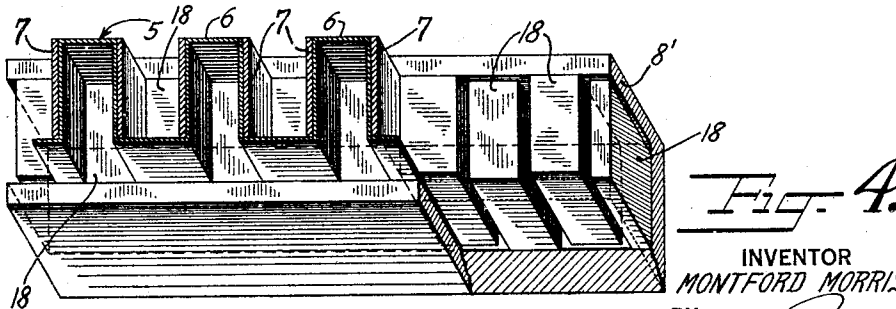
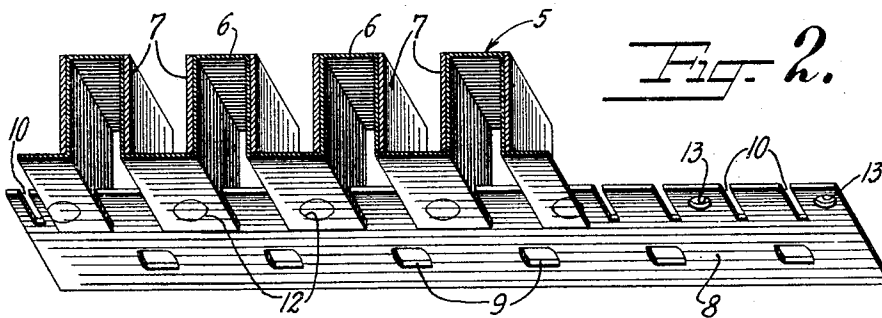
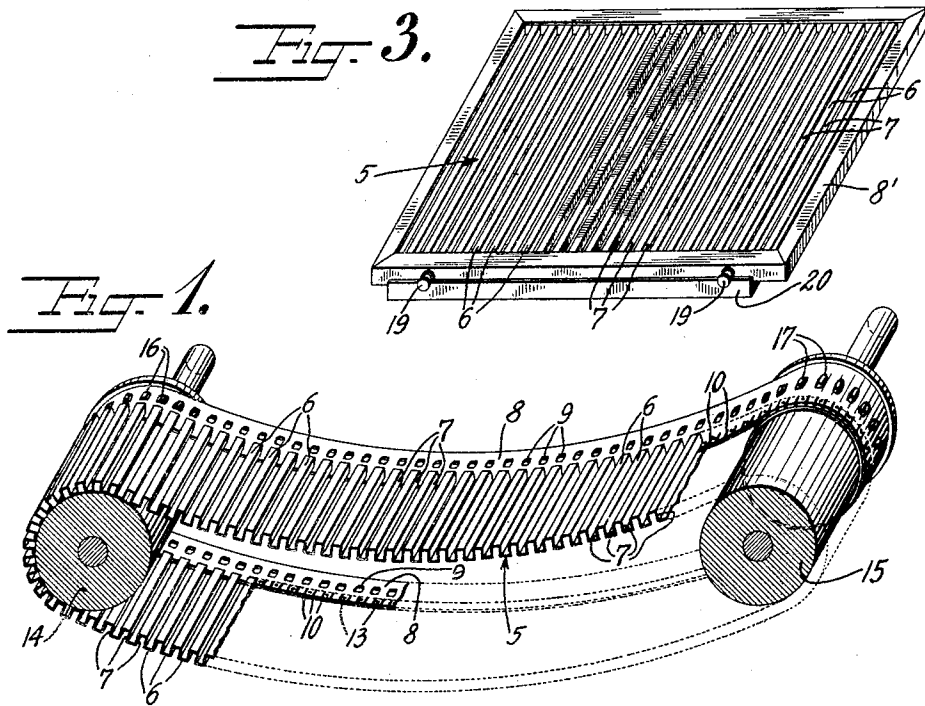
Aug. 30, 1932.

M. MORRISON

1,874,577

REVOLVING AND STATIONARY X-RAY SCREEN

Filed July 31, 1931



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REVOLVING AND STATIONARY X-RAY SCREEN

Application filed July 31, 1931. Serial No. 554,231.

My invention relates to X-ray grids of the type commonly utilized for preventing secondary X rays from blurring or fogging a sensitized film and constitutes an improvement on the structure shown and described in my pending application Serial No. 547,890 filed June 30, 1931.

It is well known that when a patient is exposed to X rays emanating from an X-ray tube the hard or primary rays pass through the body of the patient and register the bones and tissues upon a sensitized film which is disposed on the opposite side of the patient from the X-ray tube. The bones and tissues of the patient when struck by the primary rays in turn give off slant or secondary rays at an angle to that of the primary rays. Unless some provision is made to prevent these latter rays from striking the sensitized film it will become blurred or fogged resulting in a defective radiographic picture.

Various devices are well known to the art for preventing the passage of these secondary rays to the sensitized film which are moved during the exposure in the field of radiation between the patient and the sensitized film. However, such devices have heretofore been difficult and expensive to manufacture.

It is accordingly an object of my invention to provide a grid for suppressing the passage of secondary X rays which is simple in construction and economical to manufacture.

Another object of my invention is a simplified method by which a grid for suppressing secondary X rays may be constructed.

Another object of my invention is the provision of a grid which is simple in construction, that may be manufactured in the form of a continuous belt, or which may be in the form of a flat panel movable in the field of X-radiation.

Still further objects of my invention will become apparent to those skilled in the art by reference to the accompanying drawing wherein:

Fig. 1 is a perspective view of one form my invention may take with a portion of the structure broken away to better illustrate the device;

Fig. 2 is a sectional view of an enlarged scale of a portion of the structure shown in Fig. 1;

Fig. 3 is still another form of grid which my invention may take and

Fig. 4 is a sectional view of an enlarged scale of the form of my invention shown in Fig. 3.

Referring now to the drawing in detail I have shown in Fig. 1 a unitary sheet of material 5 which is composed of a material pervious to X rays such for example as aluminum. This sheet 5 is provided with corrugations 6 which may be formed therein by stamping or pressing the sheet in a die. A material 7 impervious to X rays, such as lead strips, are secured to the vertical sides of the corrugations or the impervious material may be painted or sprayed thereon to a sufficient thickness to give the desired result.

A frame member 8 is provided with elongated perforations 9, for a purpose to be hereinafter more fully stated, and lateral extending slots 10 are also provided which are spaced apart a distance corresponding to the spacing between the corrugations of the sheet 5.

The pervious sheet 5 is fitted into the notches or slots 10 (see Fig. 2) and secured to the frame member, in any suitable manner, such as by means of rivets or spot welding 12. In the event that it is desired to rivet the sheet 5 to the frame member 8 perforations may be provided in the sheet 5, during the corrugating operation, and openings such as 13, may likewise be provided in the frame member during the stamping process when the perforations 9 and slots 10 are made in the latter.

Upon completion of the aforementioned procedure the ends of the frame member 8 and sheet 5 may be secured together in any suitable manner, such as by welding, riveting or crimping to form a continuous belt. A pair of rollers or drums 14 and 15 are arranged to be rotated by any suitable means, such as an electric motor (not shown) and are provided with sprocket gearing 16 and 17 respectively. The teeth of this gearing has a spacing equal to that of the spacing be-

tween the elongated perforations 9. In this manner the continuous belt by having its perforations 9 engaged by the gear teeth may be rotated continuously in the field of exposure between the sensitized film and object to be radiographed.

By providing a positive drive of the continuous grid, that is to say the sprocket gearing, instead of depending entirely upon friction the drums 14 and 15 may be made adjustable relative to each other. This enables the continuous belt grid to be disposed or sag from a horizontal plane to a degree sufficient to permit the corrugations with their respective impervious strips to be radially disposed relative to the X rays emanating from the X-ray tube. This sag of the belt grid may thus be regulated in accordance with the distance the X-ray tube is disposed from the grid.

In the form of my invention shown in Figs. 3 and 4 the structure is somewhat analogous to that just described. The unitary sheet 5 of pervious material is likewise provided with corrugations 6 and the vertical sides have secured thereto the impervious material 7 in the manner previously described. In this modification, however, the frame member 8' which supports the unitary sheet 5 is rectangular in configuration and is constructed of substantially U shaped channels into which sheet 5 is secured by pressing or equal rigid securing means such as riveting or welding.

In order to prevent distortion of the corrugations 6 when securing the sheet 5 into the frame member 8 I provided a series of blocks 18 (see Fig. 4) having a cross section equal to the spacing between the corrugations and conforming to the configuration of these latter spacings. These blocks 18 may be separate or may be affixed to the channel frame member to permit the corrugated sheet to slide into the frame before compressing the frame or otherwise securing the sheet. A plurality of rollers 19 are pivotally affixed to the exterior of the frame member 8' to allow the completed grid to move across the field of exposure upon suitable tracks, such as shown at 20, during the period of exposure.

It can, therefore, be readily seen that I have provided a grid for suppressing the passage of secondary X rays which is simple in construction and economical to manufacture. The grid may be constructed in the form of a continuous belt which may be rotated across the field of exposure during the entire period of X-ray emanations from the tube thus readily adapting the grid to stereoscopic radiography or it may be constructed in the form of a panel rendering the same adaptable to conventional radiographic and fluoroscopic tables.

Although I have shown and described several specific embodiments of my invention

I do not desire to be limited thereto as various other modifications of the same may be made without departing from the spirit and scope of the appended claims.

What is claimed is:

1. An X-ray grid for suppressing the passage of secondary X rays comprising a frame member, a unitary sheet of material pervious to X rays provided with corrugations disposed in said frame member, and material impervious to X rays secured to the vertical sides of the corrugations of said unitary sheet.

2. An X-ray grid for suppressing the passage of secondary X rays comprising a frame member, a unitary sheet of material pervious to X rays provided with rectangular corrugations disposed in said frame member, and material impervious to X rays secured to the vertical sides of the corrugations of said unitary sheet.

3. An X-ray grid for suppressing the passage of secondary X rays comprising a frame member, a unitary corrugated sheet of material pervious to X rays disposed in said frame member, and sections of material impervious to X rays secured to the corrugated sides of said sheet disposed in radial alignment with X-radiations from an X-ray tube.

4. An X-ray grid for suppressing the passage of secondary X rays comprising a frame member, a continuous unitary sheet of material pervious to X rays provided with corrugations disposed in said frame member, strips of material impervious to X rays secured to the sides of the corrugations of said sheet radially aligned with the X rays emanating from an X-ray tube when exposed to the latter, and means for moving said frame member across the field of said X rays.

5. An X-ray grid for suppressing the passage of secondary X rays comprising a continuous unitary belt of material pervious to X rays provided with corrugations, strips of material impervious to X rays secured to the vertical sides of said corrugations, means for rotating said belt across the field of X-radiation from an X-ray tube and displacing said belt from a horizontal plane to enable the sides of said corrugations to be radially disposed relative to the X-radiation.

6. An X-ray grid for suppressing the passage of secondary X rays comprising a continuous unitary belt of material pervious to X rays provided with corrugations, strips of material impervious to X rays secured to the vertical sides of said corrugations, said belt being provided with a series of perforations, and a pair of revolvable drums provided with sprocket gearing arranged to engage the perforations of said belt for rotating the same across the field of X rays.

In testimony whereof, I have hereunto subscribed my name this 28th day of July, 1931.

MONTFORD MORRISON.