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[54] X-RAY FILM MARKER COMPRISING AN X-RAY
 FILTER AND RECESSED INDICES FILLED WITH
 X-RAY OPAQUE MATERIAL
 16 Claims, 4 Drawing Figs.
[52] U.S. Cl..... 250/67,
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ABSTRACT: A marker positionable adjacent recording material and between the material and a source of X-ray radiation, the marker having a body of material relatively transparent to the radiation with a broad area depression in which recesses in the form of film identifying characters are provided. A metallic material relatively opaque to the X-ray radiation is disposed in the recesses and a cover plate of material relatively transparent to this radiation is disposed in the depression over the recesses, the plate having in an exposed surface thereof indentations corresponding to the aforementioned identifying characters.

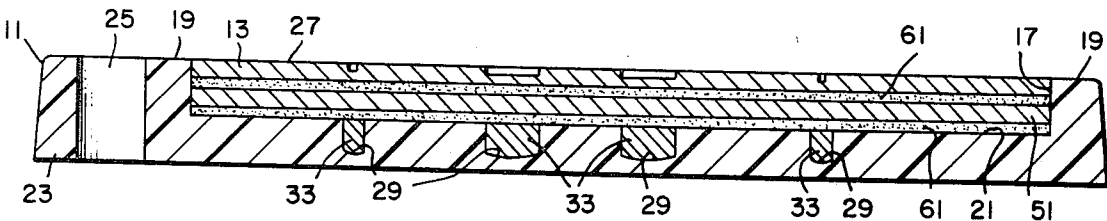


Fig. 2.

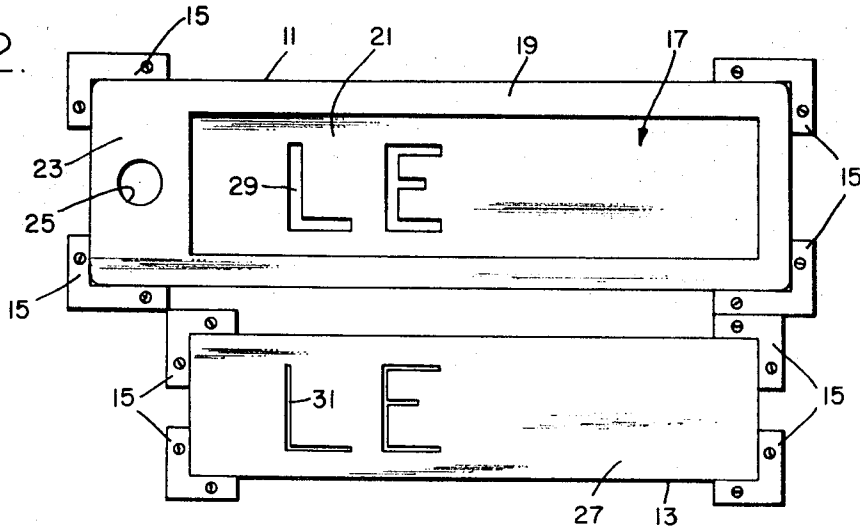


Fig. 1.

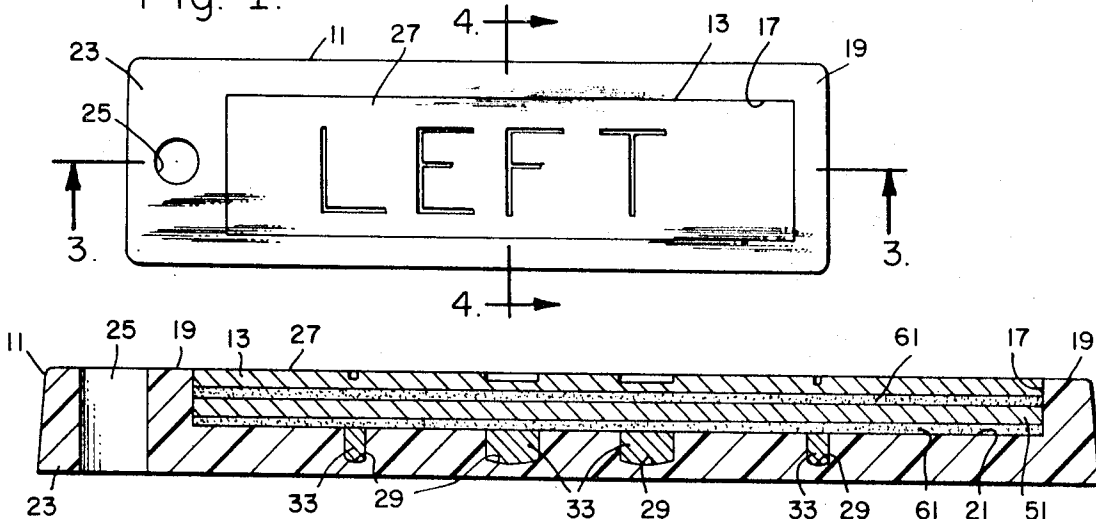
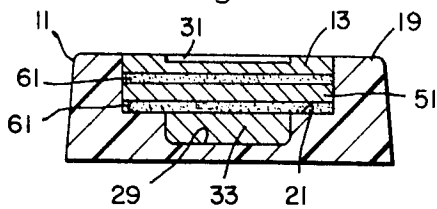


Fig. 3.

Fig. 4.



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X-RAY FILM MARKER COMPRISING AN X-RAY FILTER AND RECESSED INDICES FILLED WITH X-RAY OPAQUE MATERIAL

As X-ray technology has advanced in the medical field over the years, many changes have occurred. Mostly these changes have taken the form of better designs in the X-ray radiation generator, providing more intense energy, shorter exposure time periods, better focusing, more efficiency, and the like. On the other hand, recording materials, in the form of film sheets and plates, have not made any drastic changes. Likewise, means for identifying exposed films and plates as to parts of body, for example, have made practically no advances in the past 30 years.

These film markers generally comprise a light metallic base plate which is relatively transparent to X-ray radiation, such as aluminum, upon which premolded lead identification characters are cemented or otherwise bonded. These markers are generally placed in a shallow film tray on top of the film to be marked before the film is exposed. The wording used in the marker is chosen by the X-ray technician to correspond to the part of the body of a subject to be examined. This identification is now required in most areas of the country and in fact is generally used in medical X-ray facilities throughout the world.

The prior art devices have been bulky, generally unsightly, and do not provide very distinct film identifying characters. Because of their construction, these markers are prone to being damaged in ordinary use and more so when accidentally dropped, for example. It should therefore be obvious that a compact and attractive X-ray film marker that is easy to identify, rugged and which provides a very clear and distinct image of identifying characters would constitute a significant advancement of the art.

Accordingly, it is an object of the present invention to provide an X-ray film marker that is not subject to the disadvantages of the prior art enumerated above.

It is also an objective of the present invention to provide a compact and attractive looking X-ray film marker that is rugged in construction.

It is another object of the invention to provide an X-ray film marker that provides a more distinct image of the identifying characters on exposed X-ray recording material.

It is still another object of the present invention to provide an X-ray film marker that an X-ray technician may easily identify not only as to its characters, but also as to the size of the characters and the presence or absence of X-ray radiation filters therein.

These and other objective of the present invention are provided in an X-ray film marker having a body of material that is relatively transparent to X-ray radiation, the body having a broad primary recessed area and second recesses in the form of film identifying characters in the primary area. The marker has metallic material that is relatively opaque to X-ray radiation disposed in the secondary recesses, and also has a cover plate of material relatively transparent to X-ray radiation disposed in the primary area over the secondary recesses. The exposed surface of the cover plate has indentations therein corresponding to the identification characters.

The invention may also include one or more filter plates of material having a transmissivity to X-ray radiation between that of the cover plate and that of the metallic material disposed between these two elements.

The invention and specific embodiments thereof will be described hereinafter by way of example and with reference to the accompanying drawing wherein like reference characters refer to like elements or parts, and in which:

FIG. 1 is a plan view of a simplified setup used in the fabrication of the invention;

FIG. 2 is a plan view of a completed X-ray film marker constructed in accordance with the present invention;

FIG. 3 is a cross-sectional view of the marker shown in FIG. 3 taken along line 3—3; and

FIG. 4 is a cross-sectional view of the marker of FIG. 3 taken along the line 4—4.

With reference now to the drawing and more particularly to a fabrication set up of FIG. 1 and the complete marker of FIG. 2, there is shown a body blank 11 and a cover plate 13 securely held in respective appropriately dimensioned jigs 15. The body blank 11 can be fabricated by any conventional means such as injection molding and includes a broad recessed area 17 in one of the body's broad faces 19. The recessed area 17 has a broad recessed surface 21 and the body, adjacent one of its ends 23, may include a hole 25 for purposes of storage on an appropriately dimensioned peg (not shown). The material used for the body 11 is not critical and may be any synthetic, for example, which is relatively transparent to X-ray radiation. The cover plate 13 may also be of synthetic material or more preferably may be aluminum or an aluminum alloy with at least one of its outer surfaces 27 anodized.

The body blank 11 and the cover plate 13 are held on a working surface of a conventional tracer-engraver and identical recessed indentations 29 and 31 in the form of characters are milled in both the recessed surface 21 and in the cover plate surface 27 respectively (alternately, the indentations may be molded into the appropriate members). The diameter of the milling bits used may be the same, or the one used for the body blank 11 may be larger, as shown in the figure.

The size chosen will generally depend upon the amount of X-ray radiation the marker will be exposed to. However, the characters provided in the cover plate 13 are generally of relatively small dimensions for ease of identification and attractiveness. Since it is important for an X-ray technician to know the width dimensions of the characters of the markers, the anodized coating is used as a color code to provide this information. For example, brown may indicate a one-sixteenth of an inch character width; red, an eighth inch character width; and orange, a three-sixteenth of an inch character width. The actual characters used will depend, in the area of medical X-rays for example, upon which part of a human anatomy an X-ray observation is to be made. In practice, markers are made for all possible places or portions to be identified and the technician uses the one or combination of two or more markers he deems necessary.

Once the milling procedure is completed, the body plate 11 and the cover plate 13 are removed from the jigs 15. The recessed indentations 29 are filled with a metal 33 which is relatively opaque to X-ray radiation as seen in FIGS. 3 and 4. A metal of particular and surprisingly favorable characteristics has been found to be silver amalgam, similar in composition to that generally used as filling material in dentistry. This material is easily forced into the indentations 29 up to the recessed surface 21 and allowed to harden, the excess being scraped away.

In one embodiment of the invention, the cover plate is permanently retained in the recessed area 17 covering the metal filled indentations 29 and directly adjacent to the recessed surface 21. However, where the intensity of X-ray radiation is to be more than a predetermined amount well-known in the art, filter plates 51, which restrict to a predetermined extent the transmission therethrough of such radiation, are interposed between the cover plate 13 and the recessed surface 21 as shown in FIGS. 3 and 4. The filter plates 51 are generally of metal having a transmissivity to X-ray radiation between that of the cover plate and that of the metal filler 33 of the indentations 29. In order to facilitate the identification of the metal used as a filter in a particular marker, the color of the body blank 11 may be used as a color code, to provide this information. Thus, for example, a blue-body color may indicate that no filter is present; yellow, a brass filter plate; orange, a copper filter plate; and purple, a tin filter plate. In some instances, it may be desirable to provide more than one filter plate. The color code, of course, would so indicate.

It is also contemplated that the cover plate 13 may be fabricated from a material of the type used for the filter plates 51. In this case, additional filtering may not be needed.

Any good bonding agent such as conventional contact cement 61 may be used to permanently mount the cover plate

and the various filter plates as shown in the figures. It should be noted, that the drawing is not to scale and not in proportion. This has been done in order to make these representations more easily and clearly understood. Thus, the layers of bonding agent 61 are shown much thicker than would be actually provided. Also, the filter plate 51 is possibly shown having a larger relative thickness dimension than would normally be the case.

From the foregoing, it should be evident that a very advantageous, simple, rugged and reliable X-ray film marker has been described which does not have the aforementioned disadvantages of the prior art.

Although a specific embodiment of the invention has been described in detail, other organizations of the embodiment shown may be made within the spirit and scope of the invention.

Accordingly, it is intended that the foregoing disclosure and drawing shall be considered only as illustrations of the principles of this invention and are not to be construed in a limiting sense.

What is claim is:

1. An X-ray film marker for permanently identifying recording material exposed to X-ray radiation, comprising:
 - a rectangular body of material transparent to said X-ray radiation, said body having a broad primary recessed area adapted to receive X-ray filter means and having secondary recesses within said primary recessed area in the form of film identifying characters in said primary area; metallic material opaque to said X-ray radiation disposed in said secondary recesses; and
 - a cover plate disposed in said primary area over said secondary recesses and having in an exposed surface thereof indentations corresponding to said identifying characters.
2. An X-ray film marker according to claim 1, wherein said cover plate is fabricated from a material transparent to said X-ray radiation.
3. An X-ray film maker according to claim 1, wherein a filter plate of material having a characteristic transmissivity of said X-ray radiation between that of said cover plate and that of said metallic material is disposed between the adjacent sur-

faces of said primary area and said cover plate.

4. An X-ray film marker according to claim 3, wherein a plurality of said filter plates having differing transmissivities are disposed between said recessed surface and said cover plate.

5. An X-ray film marker according to claim 1, wherein said cover plate is fabricated from a material having a characteristic transmissivity of said X-ray radiation between that of said metallic material and that of a transparent material.

10 6. An X-ray film marker according to claim 1, wherein a bonding agent is disposed between and adheres to said recessed area and said cover plate.

7. An X-ray film marker according to claim 3, wherein a bonding agent is disposed between and adheres to said recessed area and said filter plate and another between said filter plate and said cover plate.

8. An X-ray film marker according to claim 4, wherein a bonding agent is disposed between and adheres to said recessed area and an adjacent one of said plurality of said filter plates, between and adheres to said plurality of said filter plates, and between and adheres to said cover plate and an adjacent one of said plurality of said filter plates.

9. A X-ray film marker according to claim 1, wherein the opaque metallic material is an amalgam.

10. An X-ray film marker according to claim 9, wherein said amalgam includes silver.

11. An X-ray film marker according to claim 1, wherein the outer surface of said cover plate is color coded to indicate the width of said identifying characters.

12. An X-ray film marker according to claim 1, wherein said body is of a moldable synthetic material and said cover plate is anodized aluminum.

13. An X-ray film marker according to claim 3, wherein said filter plate is brass.

14. An X-ray film marker according to claim 3, wherein said filter plate is copper.

15. An X-ray film marker according to claim 5, wherein said cover plate is brass.

16. An X-ray film marker according to claim 5, wherein said cover plate is copper.

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