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F. C. MARTIN
DENTAL X-RAY PACKAGE
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2,286,748

FIG. 1.

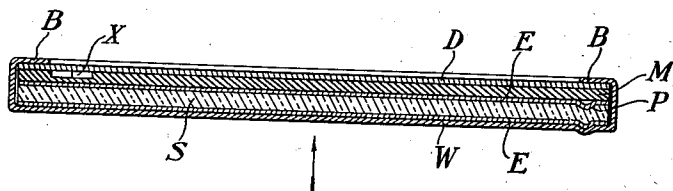


FIG. 2.

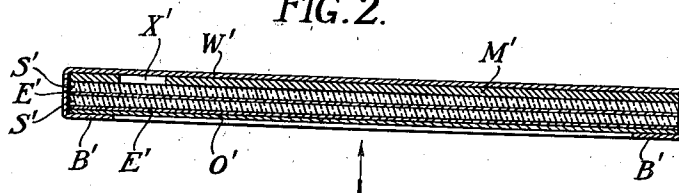


FIG. 3.

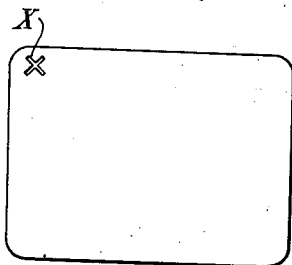


FIG. 4.

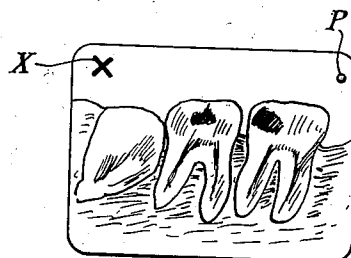
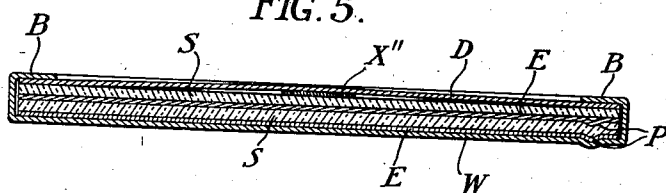


FIG. 5.



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DENTAL X-RAY PACKAGE

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3 Claims. (Cl. 250—67)

This invention relates to an improvement in dental X-ray film packages. These are made by the manufacturer with one or two pieces of sensitive film in a small sealed envelope or flat package ready to be placed in the mouth of a patient for exposure to X-rays. They ordinarily contain a thin sheet of metal foil of the same size as the film and the packages carry some exterior indication so that when used, the metal foil will be on the side away from the X-ray instrument. To assist the operator in correctly positioning the package, the film sometimes carries a protuberance and the outer surface of the package carries an indication as disclosed in my prior Patent 1,748,490, granted February 25, 1930. If, however, the package is inadvertently placed in the patient's mouth with the foil side facing the source of X-rays and a full exposure made, an image of the teeth will be formed in the sensitive film since the foil is thin and passes an appreciable percentage of the rays. When the diagnostician inspects the film, he will see the protuberance and assume that the exposure was correctly made and naturally will think it represents the side of the jaw opposite to the one exposed. Instances have occurred where, under these circumstances, the wrong tooth was extracted. This error in positioning the package has not been readily detectable from the film since the foil is of uniform thickness, and, if the image is thin, this may be attributed to insufficient exposure or development, or to development in cold or exhausted solutions.

The object of my invention is to provide a means positively detecting such an error from the developed film, and this I do by forming in the foil apertures or thin places, preferably in the form of a recognizable character or design, or by otherwise forming on the reverse side of the package, characters having different impermeability to X-rays than the rest of the package. Reference will now be made to the accompanying drawing wherein

Fig. 1 is a cross-section of a typical dental X-ray package shown by way of example.

Fig. 2 is a similar section of a differently constructed package.

Fig. 3 is a plan view of a sheet of metal foil used in the package.

Fig. 4 is a plan of an exposed and developed, but incorrectly positioned, film.

Fig. 5 is a section of a package embodying still a different embodiment of my invention.

It is to be understood that my invention is applicable to any of the many known dental X-ray

film packages now on the market and having a sheet of metal foil on one side of the film. A typical package is shown in Fig. 1, wherein the film comprises a support S with a sensitive emulsion E upon each surface. Since identical registering images are formed in each emulsion, it cannot be told from an inspection of the images, which surface actually faced the film. Even though a protuberance P is formed on the film, as described in my patent mentioned above, this merely indicates which surface should have faced the X-rays and does not assure that it was actually correctly positioned. A sheet of metal foil M is located on one side of the film. An opaque paper sheet D of the same size as the foil and film is placed outside the foil and the package is closed with an opaque paper wrapper W covering the other surface with its borders B folded over and adhesively secured to the sheet D.

A different package is shown in Fig. 2, wherein two films, each having a support S' and a single emulsion layer E', are packed with their emulsion surfaces facing away from the sheet of metal foil M' which is placed on one side of these, a sheet of paper O' being on the other side. A wrapper W' is placed over the foil and its borders B' adhesively secured to the sheet O'.

There is formed in the sheet of foil a character X, which, in Fig. 1, is shown as a thinned area, and in Fig. 2 as a perforation X' in the metal foil.

The packages are intended to be exposed from the side indicated by the arrow in Figs. 1 and 2, and this is known to the operator by indicia or directions on the package or by reason of the structure of the package. When so exposed, the film, when developed, will carry the images of the teeth without obstruction. If, however, the exposure is made through the sheet of metal foil, there will be impressed in the sensitive layer, a latent image of the character which will become strikingly visible at the first inspection after development, as shown in Fig. 4 where the developed character is shown as x.

One of the purposes of the metal foil is to prevent secondary radiation from the body tissue reaching and affecting the film. We have found that small apertures or thinned areas do not cause a discernible effect upon the image because of possible differences in secondary radiation. In practice, the foil is made of tin or lead having a thickness of the order of .003 inch, the thin area being half as thick. These may be readily made by passing the foil in a strip, before being cut to

size, under a roller with embossing characters on its periphery.

Still another embodiment of my invention is shown in Fig. 5, wherein the package is identical with that shown in Fig. 1, except that instead of forming an aperture or thin area in the foil, an additional character "X" of lead or other heavy metal is added, thus giving a light, instead of a heavy, image in the developed film. This form of the invention is particularly applicable to a package not containing a sheet of metal foil.

Since a film exposed from the wrong side gives a mirror image of that obtained when correctly exposed, (that is, an image reversed from left to right) it is possible with an ordinary film to mistake an exposure of one side of the jaw for one of the other side. If, however, the package embodies my invention and, moreover, the film has a protuberance P indicating which side should have faced the X-rays, the developed film will positively show which side should have faced the X-rays and which side actually did; and the diagnostician, in examining the film, has positive assurance upon which he can rely with confidence, as to the exposure having been correctly made and as to which side of the jaw was exposed.

It is to be understood that the indication on the exterior of the package as to which side should face the X-rays may be a printed direction, a symbol or character, or merely the structure of the package where the accompanying directions inform the operator as to its proper use.

It is to be understood that the structures described are by way of example and that I contemplate numerous modifications and equivalents, within the scope of the appended claims, as included within my invention.

I claim:

1. As an article of manufacture, a light-tight dental X-ray film package containing a sensitized film, and means on the exterior of the package indicating which side thereof should face a source of X-rays, said package including in its structure on the side thereof intended to face away from the source of X-rays areas having distinctly different permeability to X-rays, whereby if the package is exposed to X-rays from the reverse side, a latent image of such areas will be formed in the sensitive film.

2. As an article of manufacture, a dental X-ray film package comprising a sheet of film with a sensitive emulsion upon each surface thereof and having an identifiable means indicating which side thereof should face a source of X-rays and a light-tight enclosure therefor, said enclosure carrying on the exterior thereof means indicating which side of the package should face a source of X-rays and means on the side thereof intended to face away from the source of X-rays having areas of distinctly different permeability to X-rays, whereby if the package is exposed to X-rays from the side opposite that indicated by the film and the enclosure, a latent image of such areas will be formed in the sensitive film.

3. As an article of manufacture, a light-tight dental X-ray package including a sheet of film with a sensitive emulsion upon each surface thereof and having an identifiable means indicating which side thereof should have faced a source of X-rays and a sheet of metal foil upon one side of said sheet of film and coextensive therewith, there being in the foil an area of characteristic shape transmitting X-rays more freely than the rest of the sheet of foil.

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