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F. T. POWERS

1,912,464

STENCIL

Filed Nov. 21, 1931

Fig. 1.

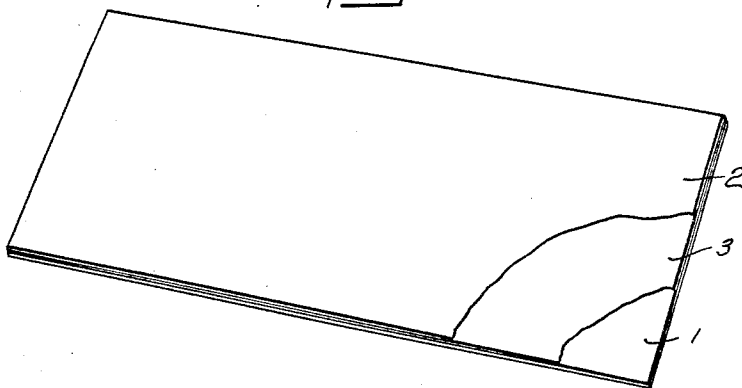


Fig. 2.

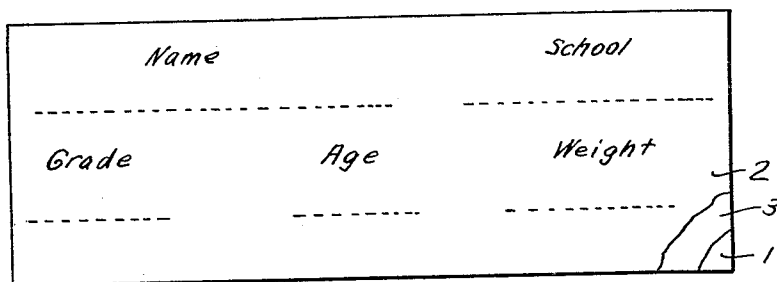


Fig. 3.

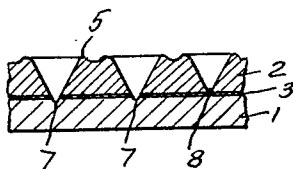


Fig. 4.

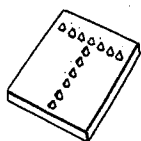


Fig. 5.

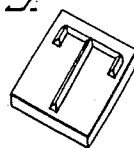
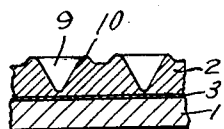


Fig. 6.



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STENCIL

Application filed November 21, 1931. Serial No. 576,607.

My invention relates to the radiographic art and more particularly to a method and product for use in connection with the marking of radiographs.

The objects of my invention are to provide means for placing identifying and informative data upon radiographs at the time of exposure to the rays which may be quickly prepared, inexpensive and capable of meeting the many demands of the art.

My invention possesses many advantages over the methods and devices now in common use. Some of these advantages will be pointed out herein; others will be obvious to one skilled in the art, or may be learned by practice in the application of the invention.

In the making of radiographs by means of X-rays, gamma rays or the like, it is highly desirable and it is the usual practice to produce some distinctive identifying mark, character, number or descriptive words upon the sensitized medium by interposing between the sensitized medium and the source of the rays at the time of exposure a stencil or form composed of a material highly resistant to the penetration of the rays. For this purpose lead is ordinarily employed.

When the radiograph is of a portion of the anatomy of a person, it is desirable to permanently record upon the radiograph certain information and data pertaining thereto, such, for example, as the name and address of the subject, the age, sex, race or other pertinent data. In the case of school children, the number or name of the school, the pupil's grade, weight, etc., may be desired.

In some cases stencils are cut in sheet lead by means of a stenciling machine of one type or another, which will cut out such letters, figures, or other character as may be desired to identify the radiograph. These stencils so prepared are interposed between the source of the rays and the sensitive medium at the time of making the radiograph. In other cases figures or letters made of lead are mounted upon small rectangles of celluloid or other suitable material not highly resistant to the penetration of the rays.

These characters so mounted are placed one by one in proper sequence side by side in a suitable holder. This holder with its arranged characters is then attached to the front of the cassette used to hold the ray sensitive medium during the exposure and left there while the radiograph is being made. Still another common method of marking is to use a counter consisting of a plurality of rotatable discs each carrying near its outer edge the digits from 0 to 9 made of material highly resistant to the penetration of the rays and suitably enclosed in a covering or protecting case of lead having openings suitably disposed in relation to each of said discs into which openings any number on the disc may be selectively arranged. By means of such a counter any desired number within the limits of the counter may be set up and by interposing the counter between the sensitive medium and the source of the rays at the time of making the radiograph the number so set up will appear on the sensitive medium after development.

All of these methods and devices have served a useful purpose and produce results acceptable for some classes of radiographs, but none of them combines speed of preparation with a considerable amount of descriptive data. For example, while the counter described may be quickly changed from one number to another, it prints no data except an identifying serial number. By means of the stencils described above, descriptive labels may be printed on the radiograph, but the time required to cut and prepare a stencil giving, for example, the name and address of the patient being X-rayed, is from one to two minutes, whereas the same information may be placed upon the radiograph by utilizing my new method and device as quickly as a typist can write it upon a typewriter, say from ten to fifteen seconds.

My new method of marking stencils does not involve cutting or punching out any portion of the ray intercepting material, but involves penetrating and laterally displacing the material to produce thin or perforated areas in the form of characters through

which thin areas the rays will penetrate and produce a clearly legible marking on the radiograph. In carrying out my invention I use a variety of forms of material. In the
 5 preferred method which I use it consists in preparing a special stencil material composed of a composite sheet or card made up of a layer of a suitable backing of cardboard or fibreboard, or celluloid, to which is attached
 10 a layer of heavy metal foil, made of lead or of an alloy composed largely of lead. On this prepared card I write with a typewriter of the usual form but having special type of a kind called pin point, each letter of which
 15 is made up of a series of small points or metal. Or I may use a light face type, having very narrow faces or sharp edges.

Although my composite sheet is made up of two main layers, with an adhesive between
 20 them, it is only the layer of metal foil which offers any appreciable impediment to the penetration of the rays. The layer of cardboard is practically transparent to the rays. It is, therefore, only necessary or even desirable
 25 to pierce or nearly pierce the metal foil in preparing my stencil, which I do in a manner hereinafter described.

I have found this method successful for the production of clear, legible titles or markings on radiographs under all conditions of exposure commonly met with in the practice of radiography upon the human anatomy. When longer exposures are required or when
 30 it is desired for other reasons, I use a heavier foil and may omit the backing material. In this form of application the characters are deeply indented into the foil leaving portions so much depressed below the original surface
 35 that the rays will penetrate the thinner areas and produce a legible legend on the radiograph.

With the aid of the accompanying drawing I will now describe in detail my invention so that one skilled in the art may make
 40 and use it.

In the drawing, Fig. 1 represents a sheet of my stencil material. Fig. 2 is a finished stencil. Fig. 3 is a much enlarged cross section of a stencil sheet. Figs. 4 and 5 are enlarged views of type bars. Fig. 6 is a much enlarged cross section of a second form of stencil sheet.
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In the preferred form of my invention a sheet of suitable backing material, such for
 55 example, as cardboard 1, is coated on one side with a layer of metal foil, 2. The adhesion of the foil to the cardboard is secured through the medium of an interposed layer
 60 of glue or cementitious material, 3. I find it important that the thickness and the hardness and density of the sheet of cardboard to which the foil is attached shall not exceed certain limits. For example, a soft yielding
 65 sheet will permit the foil to be merely pressed

or indented into the surface of such a sheet when struck by the pinpoint or sharp-edged type; whereas a sheet of hard, dense material will resist the penetration or indentation of the metal foil into the sheet and hold
 70 the foil in proper position and furnish the proper hard backing, so that when struck by the type of the typewriter the metal foil is completely or nearly pierced by each individual point or sharp edge making up the
 75 letters.

I find that cardboard of the grade known as press board or the grade known as imitation press board, to be suitable for use in the practice of my invention. I also find that
 80 other grades of material having a hard or well calendered surface are suitable if sufficiently hard to resist the pressing of the metal foil into their surface without puncturing as described above.

The metal foil which I use in this preferred form of my invention is preferably within certain limits as to thickness. I find that a foil composed almost entirely of lead, but containing a small amount of tin or other
 90 metals, and having a thickness of from 0.004 to 0.007 inches is satisfactory for general radiographic work on the human anatomy.

I find that foil of a thickness less than 0.004 may be used on radiographs of relatively thin section, such as the human hand, but for general use in all anatomical work I find the thickness range of 0.004 to 0.007
 95 to be best. The adhesive used to attach the foil to the sheet may be any suitable glue, such as carpenter's glue, fish glue, hot asphalt, etc.

Having prepared such a composite sheet and cut it into units of suitable size and shape, I place a unit in a typewriter of usual design, but provided with type bars having pinpoint or sharp edged characters, and print thereon the descriptive or identifying data which it is desired shall appear upon
 100 the radiograph.

In Fig. 2 I have shown an example of a stencil so prepared, in which 1 is the sheet of cardboard, 2 the metal foil, 3 the adhesive and 4 the stencilled characters. In Fig. 4 I have shown, much enlarged, a type bar having the letter T of the pinpoint form, while Fig. 5 shows a type bar having the letter T of the sharp edged form.
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In Fig. 3 I have shown, much enlarged, a section through my stencil showing the manner in which the individual pin points or sharp edges of the characters partially displace the metal of the foil laterally and pierce the foil at the bottom of each indentation. The lateral displacement of the metal results in a ridge 5 surrounding or along the sides of each indentation 6. The point or edge of the type penetrates the foil 2 and enters the surface of the cardboard, as shown at 7. I find that it is not essential that the
 110 115 120 125 130

type completely penetrate the metal foil, since a deep indentation of the foil, such as is indicated at 8 so reduces the thickness of the metal at the bottom of the indentation that the rays will penetrate the very thin remaining layer of metal and produce a clearly legible mark upon the radiograph. The result is a series of small perforations or near perforations in the metal foil, but not through nor appreciably into the cardboard backing to which the foil is attached.

In another form of application of my process I use a still heavier metal foil and indent the characters only partially through the foil, and I omit the backing material entirely, using only the heavy metal foil. In Fig. 7 I have shown, much enlarged, a cross-section through a portion of such a stencil made of thick foil, showing the shape of the indentations, 9, and the disposition of the metal in raised ridges, 10, along the sides of the indentations.

This type of stencil made of lead foil, .006 to .012 inch thick, I find useful when longer or more penetrating exposures to the source of the rays are used in making radiographs.

Such a stencil may be handled after preparation without injury or disarrangement of the characters; whereas other types of stencils heretofore in common use must be handled with care to prevent disarrangement or alteration.

So far as I am aware, all stencil cutting devices heretofore used for preparing stencils for marking radiographs cut out and remove portions of the stencil material in the form of a letter or character. In its preferred form my new method produces a stencil in which but one of the layers of the stencil material is perforated or pierced or deeply indented, while another layer remains substantially intact. With my new process no material whatsoever is cut out or removed from the stencil material in the preparation of the stencil.

One of the chief or characteristic differences between my new method and product and former practice lies in the fact that I produce a series of indentations in my composite sheet, whereas former methods involve cutting out portions of the sheet to form the characters desired. My indentations do not penetrate the entire sheet, but only through or nearly through the metallic layer of the composite sheet, or partially through a heavy foil.

I claim:

1. A stencil material for use in marking radiographs, comprising a sheet of cardboard having attached to one of its surfaces a coextensive layer of metal foil.

2. A stencil for marking radiographs, comprising a laminated sheet composed of a layer of soft metal attached to a fibrous backing material, the metallic layer being pene-

trated by a series of indentations arranged to form characters.

3. A stencil for marking radiographs, comprising a laminated sheet composed of a layer of a metallic alloy composed chiefly of lead, attached to a backing material, the metallic layer being penetrated by a series of indentations arranged to form characters.

4. A stencil for marking radiographs, comprising a layer of lead foil not less than 0.004" nor more than 0.007" thick attached to a sheet of pressboard, said foil being penetrated substantially completely by a series of indentations arranged to form characters.

5. The process of preparing stencils for marking radiographs which comprises attaching a layer of soft metal to a backing material coextensive therewith and indenting to substantial or complete penetration of the soft metal layer a series of tapered indentations arranged in the form of characters.

6. The process of preparing stencils for marking radiographs which comprises attaching a layer of lead to a layer of backing material coextensive therewith and indenting to substantial or complete penetration of the lead layer a series of points arranged to form characters.

7. The process of preparing stencils for marking radiographs which comprises attaching a layer of metal foil in which lead predominates having a thickness of not less than 0.004" nor more than 0.007" to a layer of fibrous backing material and substantially reducing the thickness of the foil at a series of points arranged to form characters.

8. The process of preparing stencils for marking radiographs, which comprises attaching a layer of soft metal foil to a layer of backing material and indenting into the foil but not the backing material to substantial or complete penetration, V shaped lines or dots arranged in the form of characters.

Signed at New York in the county of New York and State of New York.

FRANK T. POWERS.