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RADIATION-SENSITIVE RESISTOR

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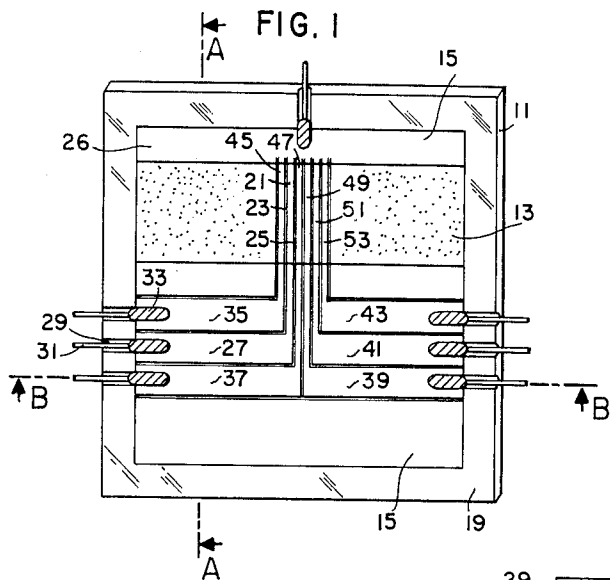


FIG. 2

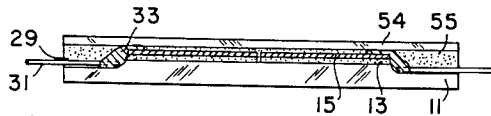
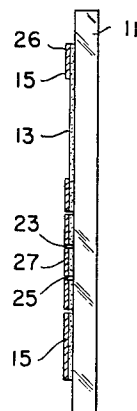
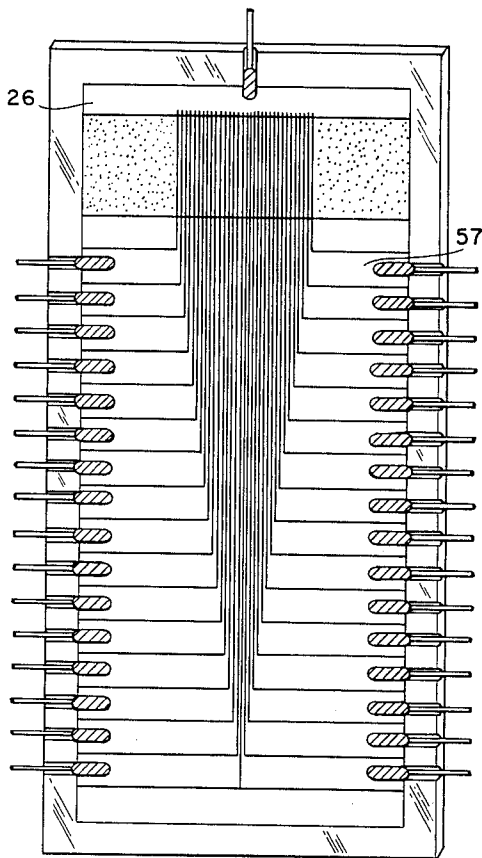


FIG. 3



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RADIATION-SENSITIVE RESISTOR

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2 Claims. (Cl. 201—63)

This invention relates to radiation-sensitive targets comprising a plurality of radiation-sensitive elements formed by separate sections of a radiation-sensitive coating applied to a nonconductive surface. Radiation-sensitive targets of this type are generally used to produce a unique electrical response when a beam of radiation, such as light, is focused on a given element of the target. When such targets comprise very small elements finely separated by means of grooves or scribe lines, some difficulties may be encountered in making good electrical connections to the separate elements of the target.

It is an object of this invention to provide a radiation-sensitive target of the above type which is constructed so as to provide convenient means of making good electrical connections to the separate radiation-sensitive elements of the target.

Other and incidental objects of this invention will be apparent to those skilled in the art from a reading of the following specification and an inspection of the accompanying drawings in which:

Figure 1 is a view in perspective of a radiation-sensitive target comprising only six elements and which will serve as a large scale illustration of the present invention;

Figure 2 is a cross-sectional view of the radiation-sensitive target of Figure 1 taken along the lines A—A;

Figure 3 is a cross-sectional view of the radiation-sensitive target of Figure 1 taken along the lines B—B; and

Figure 4 is a view in perspective of a radiation-sensitive target in accordance with this invention and comprising thirty-two separate radiation-sensitive elements.

It is contemplated that radiation-sensitive targets in accordance with this invention will comprise many very small radiation-sensitive elements having widths of the order of one hundredth of an inch or less. However, for the sake of simplicity, this invention will be described in detail with reference to Figure 1 which shows a radiation-sensitive target having only six radiation-sensitive elements, each of which has a width of approximately one sixteenth of an inch.

Referring now to Figure 1, the radiation-sensitive target comprises a body structure in the form of a plate 11. The length and width of plate 11 are determined mainly by the number, size, and shape of the radiation-sensitive elements to be applied to its surface, and the thickness of plate 11 is determined by the mechanical strength required by the target structure. A thickness comparable to that of single window glass has been found satisfactory for usual applications. Plate 11 is made of an electrically insulating material such as glass.

A radiation-sensitive coating 13 is applied to a part of the surface of plate 11. This coating may be one of activated lead sulfide. A portion of this radiation-sensitive coating is then masked while a conductive coating 15 is applied to part of the unmasked portion of plate 11. This conductive coating 15 is preferably made of gold, and it covers the upper and lower portions of the

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radiation-sensitive coating, leaving exposed the central portion 13 of the radiation-sensitive coating. A margin 19 is preferably left along the edges of plate 11.

Figure 2 shows plate 11 with the radiation-sensitive coating 13 applied thereto and the conductive coating 15 which partially covers the radiation-sensitive coating. The thickness of coatings 13 and 15 is greatly exaggerated in this Figure 2 for purposes of illustration, their actual thickness being of the order of a few microns.

Referring again to Figure 1, the radiation-sensitive coating 13 is divided by means of grooves or scribe lines into six radiation-sensitive elements such as that shown as radiation-sensitive element 21. Radiation-sensitive element 21 is a thin elongated portion of radiation-sensitive coating 13 delimited by scribe lines 23 and 25. Scribe lines 23 and 25 are shown extending slightly into the upper portion of conductive coating 15. Scribe lines 23 and 25 extend well into the lower portion of conductive coating 15, thus forming in the lower portion of conductive coating 15 a conductive path connected to the radiation-sensitive element 21. A radiation-sensitive element such as element 21 is thus part of an electrical path comprising: the upper portion of conductive coating 15 (which forms an electrode 26 common to all the radiation-sensitive elements), the radiation-sensitive element itself delimited by scribe lines 23 and 25, and a portion of the lower conductive coating 15 also delimited by scribe lines 23 and 25, and which forms an electrode 27 for the radiation-sensitive element 21.

It is to be noted that the electrode 27 is shaped by means of scribe lines 23 and 25 so that the distance between scribe lines 23 and 25 is greater in at least part of electrode 27 than the width of the radiation-sensitive element 21. This provides in electrode 27 a fairly wide area to which a good electrical connection may easily be made as shown in Figures 1 and 3. Referring to Figure 3, a groove 29 is provided in plate 11, and a conductive wire 31 is inserted in groove 29. The electrical connection from the electrode 27 to wire 31 is made by means of a dab of silver paste 33 which partially fills groove 29 and covers wire 31 and a portion of electrode 27. Similar connections are made to the common electrode 26 and to electrodes 35, 37, 39, 41 and 43 which are connected to radiation-sensitive elements 45, 47, 49, 51 and 53, respectively.

Additionally, there is shown in Figure 3 a glass plate 54 secured to the radiation-sensitive target by means of an adhesive coating 55. The plate 54 and coating 55 protect the radiation-sensitive coating 13 from the effects of moisture and oxidation and help holding the wires 31 in place. The plate 54 and coating 55 should readily transmit the wavelength of radiant energy to which the radiation-sensitive coating 13 is sensitive.

Figure 4 shows the general configuration of a thirty-two element cell in accordance with the present invention. Here again the width of the radiation-sensitive element is somewhat exaggerated, as it is contemplated that in practice it will have a width of the order of one hundredth of an inch or less. Each of the radiation-sensitive elements is electrically connected to the common electrode 26 and to a separate lower electrode such as electrode 57. Conductive wires are connected to each electrode in the same manner as wire 31.

The operation of the radiation-sensitive target in accordance with the invention is as follows: when radiation impinges upon a given radiation-sensitive element, there occurs a change in the electrical resistance of the path between the common electrode 26 and the separate lower electrode (such as electrode 27) corresponding to that element. This change of resistance may be used in ways well known to those skilled in the art to indicate how

much radiation impinges upon which element of the radiation-sensitive target.

I claim:

1. A radiation-sensitive target comprising a surface of electrically-insulating material, a radiation-sensitive coating applied to a part of said surface, a conductive coating applied over said radiation-sensitive coating and leaving exposed a portion of said radiation-sensitive coating, insulating scribe lines separating the exposed portion of said radiation-sensitive coating into a plurality of radiation-sensitive elements and extending into said conductive coating, the distance between two scribe lines separating a given radiation-sensitive element being greater in at least part of said conductive coating than it is in the exposed portion of said radiation-sensitive coating.

2. A radiation-sensitive target comprising a surface of electrically-insulating material, a radiation-sensitive coat-

ing applied to a part of said surface, a conductive coating applied over said radiation-sensitive coating and leaving exposed a portion of said radiation-sensitive coating, insulating scribe lines separating the exposed portion of said radiation-sensitive coating into a plurality of radiation-sensitive elements and extending into said conductive coating, said scribe lines forming a plurality of distinct conductive paths from a part of said conductive coating through a radiation-sensitive element to another part of said conductive coating, the distance between two scribe lines separating a given radiation-sensitive section being greater in at least part of said conductive coating than it is in the exposed portion of said radiation-sensitive coating.

No references cited.