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ELEMENT OF ASYMMETRIC CONDUCTIVITY OF SELENIUM

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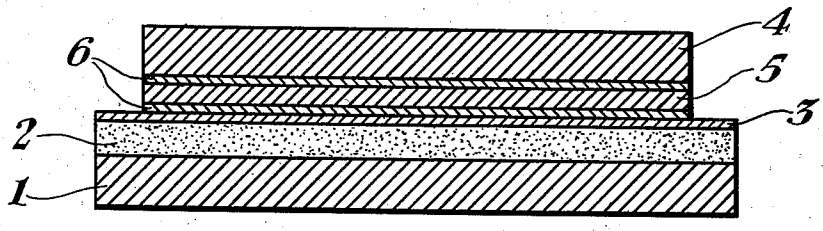

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ELEMENT OF ASYMMETRIC CONDUCTIVITY OF SELENIUM

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3 Claims. (Cl. 175—366)

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To prepare rectifier elements of selenium, ready for use, one applies generally to the assembly formed by the base support, the layer of selenium and the counterelectrode, a contact piece permitting the realization of the desired electrical mounting. This contact piece is applied to the counterelectrode, generally by one or another of the following processes:

First, the use of an elastic piece applied under light pressure to the counterelectrode.

Second, the use of contact pieces with finished surfaces applied under pressure to the counterelectrode.

These two processes present difficulties. With the first, it is not possible to protect the elements effectively by a covering made by dipping, the paint or varnish penetrating between the contact pieces.

With the second process, if the contact pieces are not perfectly finished and present irregularities, the pressure is found to be localized at certain points, which may have the effect of leading to a direct contact between the contact piece and the selenium at these points, resulting thus in a deterioration of the blocking layer which is formed at the contact of the selenium layer and the counterelectrode, the latter comprising a metal fusible at a relatively low temperature.

The present invention, due to the work of Monsieur Roger Doucot, has for an object a process which permits these difficulties to be overcome and the provision of an element of asymmetric conductivity having a contact piece perfectly assembled to the element.

The said process is essentially characterized by the fact that there is interposed, between the counterelectrode and the contact piece, a sheet of soft metal coated with a layer of alloy having the same composition as that which is utilized for the counterelectrode or with a layer of any alloy favoring or activating the formation of the blocking layer, the assembly being made under heavy pressure.

The present invention has likewise for an object, the new industrial product constituted by an element of asymmetric conductivity with a selenium base and provided with a contact piece which is obtained by means of the process above indicated.

In the single figure in the annexed drawing, there is represented, schematically and by way of example, a mode of realization of the present invention.

As may be seen, the element with asymmetric

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conductivity consists, as ordinarily, of a base support 1, of a layer of selenium 2 and of a counterelectrode 3, but in place of receiving the contact piece directly, it is provided with a metallic intermediate layer formed of a soft metal 5 (lead for example) covered, preferably, on its two faces by a coating 6 made of an alloy having the same composition as that which constitutes the counterelectrode 3, that is to say, an alloy of a metal fusible at a relatively low temperature, generally with a cadmium base with the addition of some other metals or elements in small enough quantity to permit obtaining predetermined electrical qualities favoring the formation of the blocking layer. It is unnecessary to give herein an example of this alloy as this may be of any well-known type used heretofore for the formation of the counterelectrode.

These different assembled elements, consisting of the base support 1, the selenium layer 2, the counterelectrode 3, the double intermediate plate 5—6 and the contact piece 4, are then assembled under high pressure, in such manner as to constitute a complete rectifier element, ready to be introduced into an electric circuit as desired.

As is obvious, the intermediate sheet 5 of soft metal, can be applied on only one of its sides, the upper coating serving substantially no purpose. However, for practical reasons and to facilitate assembly, it is preferable to utilize an intermediate sheet 5 plated on each face, so that in assembling, one is sure that a coating of an alloy analogous to that of the counterelectrode 3 comes into contact with this counterelectrode.

By reason of this manner of procedure one avoids the ill effects of poor finish of the contact piece or of irregularities in this piece, the sheet of soft metal reproducing the pressure acting upon the surface of the counterelectrode without being able to produce higher pressures at certain points with the liability of damaging the surface of the counterelectrode 3.

Moreover, by reason likewise of the process which has been described above, even if this condition occurs at certain points, this would have only a secondary importance, or if the double intermediate sheet comes into contact with the surface of the layer of selenium 3 at a point which is not metalized, as may happen, beyond the extent of the metallized layer, that would cause no difficulty since that which would come into contact with the layer of selenium would be the lower facing of the sheet of soft material 5 which is made of the same alloy as that which

constitutes the counterelectrode 3. Under these conditions at such points, there would be likewise for the same reasons as in the case of contact of the counterelectrode of fusible metal with the selenium layer, the production of a blocking layer under the influence of the current traversing the element.

Thus in any case, the blocking layer is formed over the entire area of contact and its deterioration does not occur.

Moreover, the assembly thus obtained under heavy pressure permits, without any difficulty, the effective protection of the element by a protective coating made by dipping, since the paint or varnish, due to the fact of assembly under high pressure, is incapable of penetrating between the parts in contact.

Having thus described my invention, what I claim is:

1. A contact member for making contact under pressure with the counterelectrode layer of a selenium rectifier element comprising a sheet of soft metal coated with a layer of material having the same composition as the counterelectrode layer.

2. A contact member for making contact under pressure with the counterelectrode layer of a selenium rectifier element comprising a sheet of soft metal coated on the side adjacent to the counterelectrode layer of the rectifier element with a layer of material having the same composition as the counterelectrode layer.

3. A contact member for making contact under heavy pressure with the counterelectrode layer of a selenium rectifier element comprising a sheet of soft metal coated with a layer of material having the same composition as the counterelectrode layer, whereby if the contact member comes in contact with the selenium layer of the rectifier element due to the absence or break down of a portion of the counterelectrode layer as soon as current traverses the rectifier element a blocking layer will be formed at the point or points where the contact occurred.

ROGER DOUCOT.

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