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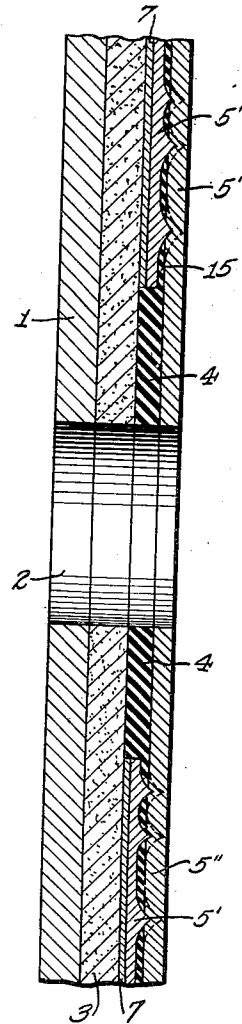
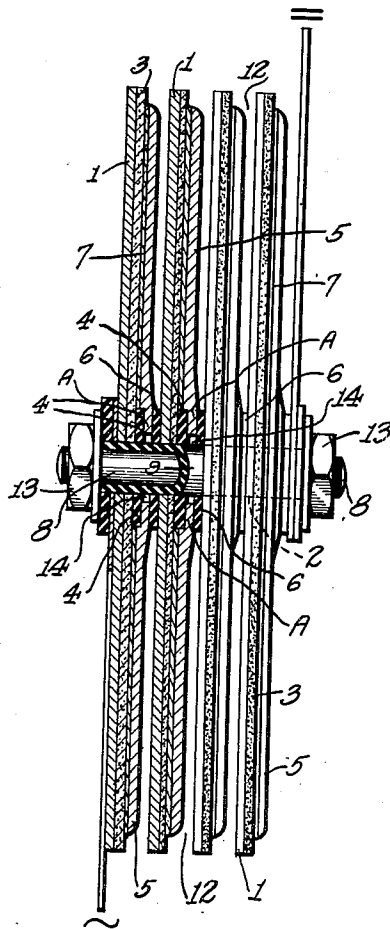
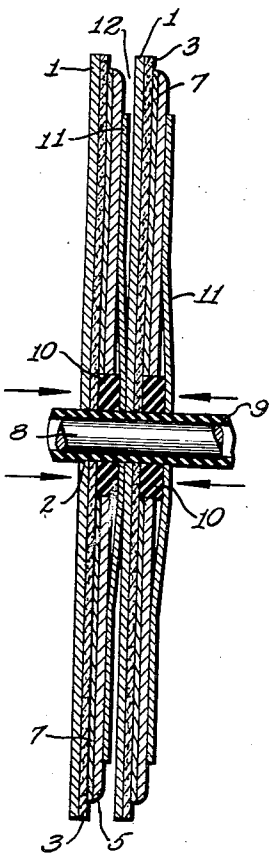
DRY RECTIFIER

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FIG.1.

FIG.2.

FIG.3.



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DRY RECTIFIER

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7 Claims. (Cl. 175—366)

This invention relates to rectifiers of the kind comprising so-called valve discs and consists in certain features of novelty which will appear from the following description, reference being had to the accompanying drawing, in which

Fig. 1 is a fragmentary sectional view of a prior arrangement improved by the invention, Fig. 2 is a fragmentary partially sectioned view illustrating an example of devices as provided by the invention, Fig. 3, drawn to a larger scale than Figs. 1 and 2, is a fragmentary sectional view of a valve disc which is a modification of the discs represented in Fig. 2.

For the sake of clearness the plates and layers constituting the valve discs are shown larger in thickness than they really are.

The valve discs represented in Figs. 1 and 2 are in well-known manner each composed of a base plate electrode 1, a semi-conductor layer 3 carried by plate 1, the so-called counterelectrode 5, produced by spraying metal against layer 3, and the so-called blocking layer 7 that forms between the layers 3, 5 during the manufacture of the valve discs. These rectifying valve discs 1, 3, 7, 5 have each a central bore 2 provided in the plate 1. The bores 2 are to receive a mandrel composed of a spindle 8 and an insulating tube 9 inserted over this spindle. The valve discs are serially mounted on the mandrel 8, 9.

The prior arrangement illustrated in Fig. 1 has insulating discs 10 and resilient contact plates 11 likewise mounted on the mandrel 8, 9 and disposed between the valve discs. The plates 11 are arranged to contact with the counterelectrodes 5 and base plate electrodes 1 and thus serve to interconnect the valve discs. The discs 10 bear against the layers 3 and plates 11 and are surrounded by the counterelectrodes 5. They are thick enough to provide for cooling interspaces 12 between the valve discs.

The arrows in Fig. 1 are to indicate that the valve discs, the discs 10 and plates 11 are pressed together. This may be done by a means of the kind shown in Fig. 2, namely, nut screws 13 mounted on spindle 8.

The present invention enables the interspaces 12 to be provided without the aid of additional contact plates, such as the plates 11, Fig. 1, whereby devices according to the invention are simpler and cheaper than the prior ones. To such end the contact plates 11 are each replaced by an extension A of the counterelectrodes 5, as will be seen in Figs. 2 and 3. In the example shown in Fig. 2, metal discs 6 are arranged on mandrel 8, 9 to contact each with one of the

extensions A and the adjacent base plate electrode 1, so as to interconnect this plate and the adjacent electrode 5. By means of the discs 6 cooling interspaces 12 of the desired width are provided between the valve discs. The extensions A are separated from the layers 3 by annular insulating means which preferably are constituted by a lacquer coating 4 on the layers 3. The valve discs are pressed together by the nut screws 13 of spindle 8. The coatings 4 prevent the plates 1 and electrodes 5 from becoming interconnected in the zone of pressure by the pressure destroying in this zone the layers 3. Interconnection of the parts 1, 5 would cause the blocking layer 7 to be short-circuited.

Preferably an interspace 14 is provided between the extensions A and tube 9, that is to say, when spraying metal against layer 3 and coating 4, thus producing the electrode 5, the inner edge of the coating 4 is left free from such metal, which otherwise might enter the bore 2 so as to interconnect the parts 1, 5 and thereby to short-circuit the blocking layer 7. Equally, as shown in Figs. 1 and 2, the outer edge of layer 3 should be free from metal. In fact, the semi-conductor layer 3 sometimes has fissures or cracks in its outer edge or is crumbled off there, whereby the metal sprayed against layer 3 might be able to interconnect the parts 1, 5, thus short-circuiting the blocking layer 7 also in this case.

The lacquer coating 4 may be applied to layer 3 by stamping or rolling or any other suitable method.

In the case of selenium as semi-conductor the lacquer coating 4 may be applied to the semi-conductor layer 3 while this is still amorphous or may be applied to it after the selenium has undergone the first step of the well-known forming process, whereupon the assembly 1, 3, 4 is placed in a furnace in which the forming of the selenium is completed while at the same time coating 4 is burnt onto the selenium.

According to Fig. 3 the lacquer coating 4 may be produced as follows. On the semi-conductor layer 3 metal is sprayed to form a layer 5' which does not cover a central zone of layer 3, namely, a zone of the size of the desired coating 4. The assembly 1, 3, 5' is then provided with a lacquer coating 15 by dipping or spraying. In this way coating 4 is obtained as a part of the coating 15. On coating 15 a second metallic layer 5'' is produced by spraying metal against it. The metal so striking the coating 15 acts to destroy it at points where layer 5', being produced by dipping or spraying, has raised portions. At these points

the layer 5'' will hence contact with layer 5' and thus constitute a counter-electrode 5', 5'' equivalent to that designated 5 in Fig. 2. In order to give a pictorial idea of this the dotted line in Fig. 3 represents by way of example the surface of the coating 15 before the layer 5'' is produced on it.

What is claimed is:

1. The method of manufacturing a valve disc which comprises spraying a metallic material onto a semi-conductor layer except for a central area thereof, so as to produce an annular metal layer on the semi-conductor layer, providing such metal layer and said area with a lacquer coating, that part of the lacquer coating which is applied to this area constituting an insulating means, and spraying a metallic material onto such lacquer coating so as to form a metal layer thereon and to destroy the lacquer coating in part, whereby the two said metal layers contact with each other through the lacquer coating, thus constituting the said counterelectrode.

2. The method of manufacturing a valve disc in which the semi-conductor layer is of selenium while the insulating means is a lacquer coating, which method comprises applying this lacquer coating to an amorphous selenium layer and then heating the assembly composed of a base plate electrode, selenium layer and lacquer coating to the forming temperature of selenium.

3. The method of manufacturing a valve disc in which the semi-conductor layer is of selenium while the insulating means is a lacquer coating, which method comprises the step of heating the assembly composed of a base plate electrode and

selenium layer to a preliminary forming temperature of selenium, applying the said lacquer coating to the selenium layer, and heating the assembly composed of the base plate electrode, selenium layer and lacquer coating to the forming temperature of selenium.

4. A rectifier comprising a base plate, a semi-conductor layer carried by the base plate, a first sprayed metal layer placed over an outer portion of the semi-conductor layer, an insulating layer over the central portion of said semi-conductor layer and extending in a thin coating over said sprayed metal layer, and a second sprayed metal layer over said thin insulating coating and making contact with the first-mentioned sprayed metal layer.

5. A rectifier according to claim 4 in which the first and second sprayed metal layers make contact with each other at minute points through the thin insulating coating.

6. A rectifier according to claim 4 in which a blocking layer is formed between said semi-conductor layer and the first sprayed metal layer.

7. A rectifier comprising a base plate, a selenium layer carried by the base plate, a central portion of said selenium layer being covered by a disc of insulating material, a portion of said selenium layer not covered by said disc being covered by a blocking layer, a sprayed metal layer covering said blocking layer, an insulating film over said metal layer, and a second metal layer covering said film and said insulating disc, said metal layers making contact with each other at minute points through the insulating film.

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