

July 7, 1953

Filed June 6, 1950

M. AUPHAN
METHOD FOR THE MANUFACTURE OF A SCREEN
FOR A TELEVISION APPARATUS OR THE LIKE

2,644,208

2 Sheets-Sheet 1

Fig. 1

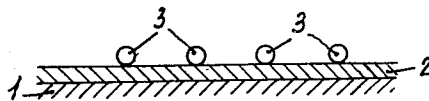


Fig. 2

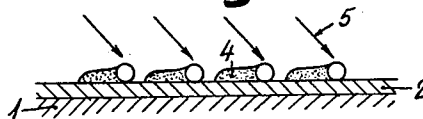


Fig. 3

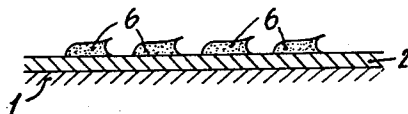


Fig. 4

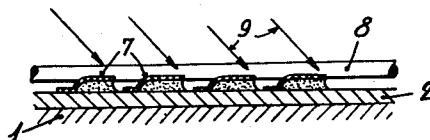
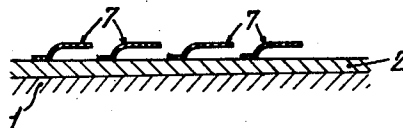


Fig. 5



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Fig. 6

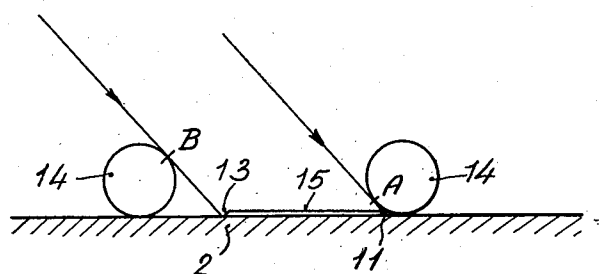


Fig. 7



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UNITED STATES PATENT OFFICE

2,644,208

METHOD FOR THE MANUFACTURE OF A
SCREEN FOR A TELEVISION APPARATUS
OR THE LIKEMichel Auphan, Paris, France, assignor to Societe
Generale d'Electronique, Monaco, Principality
of MonacoApplication June 6, 1950, Serial No. 166,414
In France June 11, 1949

10 Claims. (Cl. 22-190)

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Certain devices, for the projection of television images comprise a plate or screen intended to afford a convenient modulating of the light issued from an auxiliary source. Such a device is described, in particular, in my copending application Serial No. 176,355, filed July 28, 1950.

The object of the present invention is a method for the preparation of such a plate or screen for any apparatus of that type or of any other kind where it can be needed, said method, consisting in setting upon the plate a network of fine wires or threads as parallel and equidistant as possible, evaporating a suitable intermediate substance on to said plate, removing the threads or wires, setting again a similar network in any other suitable direction, evaporating any suitable substance on to the plate, removing such second network of wires or threads and removing the intermediate substance.

I will now describe the method according to my invention with reference to the accompanying drawings wherein Figures 1, 2, 3, 4, 5, 6 and 7 show, schematically the successive stages in the preparation of such a plate.

The supporting plate 1 having been covered or not with any kind of coating 2, for instance an insulating coating, by any suitable means, (anode oxidation, evaporation in a vacuum, electrophoresis), parallel filaments or strands of fine wire are arranged on the plate, the strands being spaced according to the dimensions to be given to the elemental surfaces. These strands may be arranged on the plate 1 by winding them around said plate, or by the application of a previously prepared grating. In such a case, the wires may be, for instance, stretched inside a frame so as to form a plane grating, a mechanical device being preferably provided for applying the grating on the supporting plate accurately. The wires should be as parallel as possible with the plate, parallel together, and equidistant. These wires will be, for instance, silk, nylon or any other kind of wires or threads, of metal for instance, with a diameter of the order of 20 microns or any other suitable dimension.

To obtain elemental squares, a rectangular plate will be used, preferably, keeping the parallel wires on one of the sides.

Figure 1 is a partial diagrammatic section, showing the wires 3 arranged in this manner.

Then a suitable substance is evaporated under a vacuum on to the surface of the plate thus wound, with a suitable direction of evaporation with respect to the plate and wires. Figure 2

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shows, at 4, the deposits thus obtained. The direction of evaporation is shown by the arrows 5.

The wire is then unwound and the evaporated substance remains, in strips, as shown on Figure 3, denoted by reference numeral 6.

After the wire has been arranged in a second direction, different from the first one and with the same conditions of parallelism and equidistance, the selected metal is evaporated to constitute the desired elemental surfaces. Here again, this may be effected by winding the wire or applying the above mentioned grating or any other element in a new and adequate direction. Figure 4 illustrates this stage. It shows the metal deposited at 7, the wires 8 and the direction of evaporation shown at 9.

If the wire is then withdrawn, and if the evaporated substance is destroyed by any suitable means, (dissolution, evaporation), the desired plate is constituted. It is thus necessary to utilize, as an intermediate substance, a substance which can be destroyed without affecting the plate, its insulating layer or other eventual layers, or facets, elemental surfaces, tapes or the like, which it is desired to obtain. By way of example, paraffin, wax, or a salt, etc. may be used.

In case a grating is used, the latter can be used again for preparing other plates, after a suitable cleaning.

The wires are not necessarily cylindrical, and they may have any section whatsoever. In particular they may be square bars, obtained from one plate of metal.

Within the scope of the example of my hereinabove mentioned copending application a few non-limitative precisions will be given hereinafter by way of example.

The plate is rectangular or square shaped.

Nylon or silk thread is used, having a diameter of the order of 20 microns, which is arranged so as to have one thread every 80 microns.

Paraffin is evaporated in a direction perpendicular to the threads, and at 45° with respect to the normal to the plane of the plate; and this to a thickness of the order of 1.5 microns of paraffin. This obliqueness is not necessary, it simply has the advantage of making one of the edges of the first layer evaporated sharper than the other one.

Figure 6, appended to illustrate this point, shows that the shadow is projected on the edge of layer 15 from one point A of the thread

14, closer to the plate than point B whence the shadow is cast on the edge 13. The result is that the edge 11 of the layer 15 is sharper than its edge 13.

If it is desired to manufacture a fairly large plate, however, it may be of interest to sacrifice this advantage to the necessity of obtaining strips of a uniform thickness, especially if a chamber large enough to place the evaporator sufficiently far from the plate is not available. The plate is then placed perpendicularly to the direction of evaporation.

After they have been removed, the threads or wires are again arranged, for instance with the same spacing and in a perpendicular direction (by rotating the grating by 90° parallel to its plane).

The metal evaporation is continued to the required thickness in the same direction as the first one, this direction being now 45° with respect to the direction of the wires or threads. The wires or threads are then removed and the paraffin is evaporated by heating under a reduced pressure.

It is obvious that the invention is not limited to the applications offered by patent application Serial No. 176,355, filed July 28, 1950, and that any other application of its principle and characteristics is within its scope.

In particular, the second evaporation may be effected perpendicularly to the plate or in any other suitable direction. This allows the obtaining of plates with structures slightly different from that described in the said patent; for instance, if the evaporation is effected normally to the plate, the squares, rectangles or other elements will not be detached and a series of corrugated parallel tapes are obtained as shown schematically in Figure 7.

All directions of evaporation with respect to the plate or threads are thus within the scope of the invention the choice to be made depending only on the application contemplated.

The components used, plate, support, intermediate substances, metal mosaic, are not within the scope of the invention, which remains applicable with the most varied substances. Similarly, plate 1 is not necessarily a conducting plate or a plate covered with an insulating layer. Numerous applications may be contemplated in which it is quite differently constituted. It may be, for instance, entirely insulating or entirely conducting. It may thus be said that the manufacturing method applies to any part having a plane face.

The invention extends, by way of new industrial products to plates manufactured in this manner.

What is claimed is:

1. A method for manufacturing plates for television apparatus and the like, comprising the steps of covering a plate with a set of substantially parallel and equidistant spaced filaments; depositing on said plate a non-metallic substance

so as to form intermediate said filaments non-metallic solid strips each being in contact with at least one of said filaments so as at least partly to fill the spaces between said filaments, said non-metallic solid strips being transformable into a fluid condition; removing said filaments from said plate so as to leave said deposits of said non-metallic solid separated from one another by spaces at least part of which was occupied by said filaments; placing on said deposits of said non-metallic solid a set of substantially parallel and equidistant spaced filaments extending in a direction different from that of said first-mentioned filaments; depositing a metallic substance on the areas of said plate and said deposits of said non-metallic solid between said second-mentioned filaments so as to form metallic elements having a base end portion adhering to said plate and a raised end portion being substantially parallel to said plate and separated from said plate by a distance substantially corresponding to the thickness of said deposits of said non-metallic solid; removing said second-mentioned filaments from said deposits of said non-metallic solid; and removing said deposits of said non-metallic solid by transforming the same into the fluid condition thereof.

2. A method according to claim 1 in which the filaments are wound around the plate and the non-metallic substance is deposited on one side of said plate.

3. A method according to claim 1 in which the set of substantially parallel and equidistant spaced filaments covering the plate consists of a prefabricated grid.

4. A method according to claim 1 in which said deposits of said non-metallic solid are removed by evaporating the same.

5. A method according to claim 1 in which said deposits of said non-metallic solid are removed by dissolving the same.

6. A method according to claim 1 in which said substantially parallel and equidistant spaced filaments consist of nylon.

7. A method according to claim 1 in which said substantially parallel and equidistant spaced filaments consist of silk.

8. A method according to claim 1 in which said substantially parallel and equidistant spaced filaments consist of metal.

9. A method according to claim 1 in which said non-metallic solid strips consist of wax.

10. A method according to claim 1 in which said non-metallic solid strips consist of paraffin.

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