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METHOD OF AND MEANS FOR MIRROR MAKING

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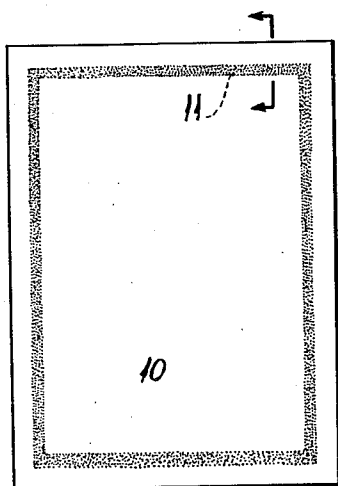


Fig-1

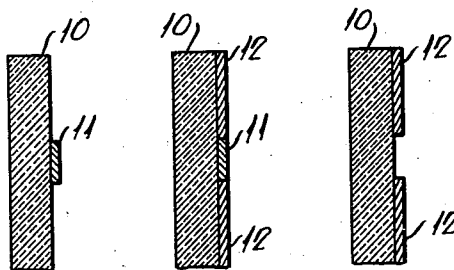


Fig-2 Fig-3 Fig-4

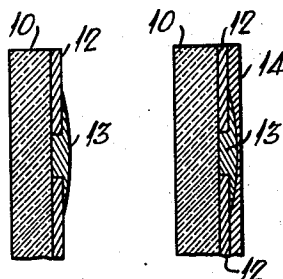


Fig-5 Fig-6

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METHOD OF AND MEANS FOR MIRROR MAKING

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9 Claims. (Cl. 41—29)

This invention relates to the ornamentation of mirrors and the like, and more specifically relates to the placing of a resist on the rear surface of a glass to be made into a mirror so as to form an ornamental design, then applying a silver film to the rear surface of the glass and the like, then subjecting the resist to a chemical agent to remove the resist from the glass, leaving an ornamental design which is unsilvered, and which design can be covered over or filled in with a "color material" and then the entire rear surface usually has applied thereto a suitable protective backing, covering the silver film and the ornamented portions. By the term "color material" used in the specification, it is not meant that the material must have color, but may be transparent or colorless.

It is an object of this invention to provide a method of ornamenting transparent sheets of material, such as glass, as employed in mirror making, by placing on the sheet a design by employing a water insoluble design forming material or resist which will protect that portion of the sheet from a coating of silvering and with the resist in position on the sheet, applying silver nitrate in solution to the side of the sheet having the resist thereon, which silvering will adhere to all portions of the surface except the portions covered by the resist, and even though the silver may cover the resist, the silver film is porous to the agent employed in removing the resist, then subjecting at least the portions of the sheet having the resist thereon to a suitable liquid agent to penetrate the silver film and remove the resist from the sheet, leaving the portions of the sheet once covered by the resist in its original condition, to form an ornamental design which is unsilvered. The mirror can then have a suitable backing applied to the silver film, and if desired, such material such as color material, can be applied to the unsilvered portions before the backing is applied and the backing can be applied to the silver film and to the color material to protect the same.

It is a further object of this invention to provide methods and means for ornamentation of sheets of glass in mirror making wherein a suitable ornamental figure can be placed on the surface of the glass in the form of a resist and which can be applied by stencil or by hand, or otherwise, and then subject the glass to a silvering operation to cover the rear surface thereof having the resist thereon with a silver film, then subjecting the glass to the action of a solvent by immersion, spray or otherwise to cause the

solvent to penetrate any portions of the silver film which might be disposed over the resist and to lift the resist together with any silver film which may be deposited on the resist, from the glass and leave the surface of the glass formerly covered by the resist, in its original condition. This unsilvered portion may be covered with a transparent backing along with the silver film, or if desired, any suitable color material may be applied to the unsilvered portions, then a suitable backing can be applied to the silver film and to the color material. I have found that solvent naphtha or lacquer thinner or ethyl acetate, paint and varnish remover, makes a good solvent.

This application is a continuation in part of our copending application, Serial No. 621,640, filed July 9, 1932.

Some of the objects of the invention having been stated, the invention will appear more fully in the detailed description hereinafter following when taken in connection with the accompanying drawing, in which:—

Figure 1 is an elevation of a mirror showing an ornamentation applied thereto;

Figure 2 is a vertical sectional view showing the ornamental resist applied to the rear surface of the glass before the silvering operation;

Figure 3 is a view similar to Figure 2 but showing both the silvering and ornamental resist applied to the glass;

Figure 4 is a view similar to Figure 3 but showing the ornamental resist lifted from off the glass after it has been subjected to the solvent bath;

Figure 5 is a view similar to Figure 4 but showing a color film disposed on the portion formerly occupied by the ornamental resist;

Figure 6 is a view similar to Figure 5 and showing the completed mirror with the color material for ornamentation and backed up by a suitable backing layer.

In carrying out the method, it has been found that a design forming material or resist having the following ingredients therein has produced excellent results:

Fourteen percent Chinawood oil, three and one-half percent bodied linseed oil, twelve percent resin ester, four and one-quarter percent turpentine, twenty-one percent mineral spirits, one quarter percent metallic drier, three percent black toner, twelve percent bone black, six percent carbon black, and twenty-four percent calcium carbonate. The percentages in the above ingredients are exemplary, and it is evident that variations therein may be made without affecting

the efficiency thereof. For example, the ingredients which give viscosity may be decreased or increased in percentages to determine the viscosity of the material to form a liquid-like material as desired.

The design forming material or resist can be applied in any suitable manner. It has been found that a suitable silk stencil may be employed and the material worked therethrough or it is evident that where sharpness of lines might not be required, that an ordinary stencil may be employed, or the resist can be applied by brush or otherwise.

A transparent sheet of material such as a sheet of glass 10 may be employed and the resist 11 is applied thereto and is allowed a short time to dry. Then the sheet is subjected to a bath of stannous chloride to sensitize the surface of the sheet on which a silver film is to be deposited. This is conventional and does not affect the resist. Then silver nitrate in solution is applied to the sensitized surface, which film 12 covers the entire surface except that portion covered by the resist 11. In some instances, the silver film 12 may also cover portions or all of the resist, but on account of a silver film being porous, this does not prevent the removal of the resist by the solvent bath which is employed for this purpose.

After the silver film has a sufficient time to become a solid film 12, then a solvent is applied to the portions covered by the resist or the entire sheet can be submerged in the solvent. This solvent penetrates the silver film if it covers the resist and removes the resist from the sheet, usually lifting it as a whole and causes the lifted resist to float away from the sheet in a body, that is, when the sheet is immersed in the solvent. It has been found that a suitable solvent bath may be provided by using xylol, which is a solvent naphtha boiling at 165° C. If desired, there may be added to the xylol approximately two percent acetone, three percent butyl acetone and eight percent butyl alcohol, thus decreasing the xylol to approximately eighty-seven percent. Also ethyl acetate, paint and varnish remover or lacquer thinner made from one part amyl acetate and two parts toluol may be used as a solvent.

It has been found that the above-named solvents for the resist do not dissolve the resist but attack it and breaks its adhesion to the sheet and cause it to expand and to float, as a whole, away from the sheet. The removed resist resembles spawn. It is believed that the xylol attacks the resist and expands the same and the specific gravity of the resist being less than the naphthalene or xylol bath, causes it to move away from the sheet and sink to the bottom of the naphthalene bath or any other suitable solvent.

If desired, a transparent backing can be applied to the surface to cover the silvered and unsilvered portions, or if desired, a color material 13 can be applied to the unsilvered portions and then a suitable backing 14 can be applied to the silver film and the color material. This color material may be devoid of color if desired, or suitable pigmentation may be present therein, as desired.

So far as we are advised, we believe that the provision of a suitable resist which can be removed by a suitable liquid penetrating the silver film and removing the resist without attacking the silver film on the sheet is new, as it produces a sharp outline and lends itself to fine line work which permits use of a fine mesh silk screen, and

which cannot be obtained by other methods employing paint, whiting and the like, as a resist.

By the term "bath" herein employed as a means of subjecting the resist to the solvent agent, is meant immersion, spray or other forms.

If desired, a suitable paint remover may be used to remove the resist but the mirror must then be treated with a suitable neutralizing solution to remove all traces of the paint and varnish remover.

Also, any lacquer thinner may be employed to remove the resist but afterwards the mirror must be bathed in a neutralizing solution to remove all traces of the thinner to insure against silver spoilage. A lacquer thinner may be made from one part amyl acetate and two parts toluol.

In the drawing and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

We claim:

1. That method of ornamenting a sheet of glass which comprises applying a resist to one surface of said sheet of glass to form an ornamental design visible through the glass, allowing the resist to dry, applying a film of silver to the surface of the glass on which the resist appears to cover the said surface, subjecting the glass to a bath of solvent naphtha, paint remover, lacquer thinner and the like, to remove the resist bodily from the glass.

2. That method of mirror making which comprises forming a design on the rear surface of a sheet of glass with a resist and which is visible through the glass, silvering the rear surface of the glass to cover all portions thereof, subjecting the glass to a bath to remove the resist from the surface of the glass to leave the portion of the glass covered by the resist, unsilvered.

3. That method of ornamenting transparent objects which comprises applying resist to a portion of one surface of the object to form an ornamental design visible through the glass, allowing the resist to dry, then applying silver nitrate in solution to said one side, allowing the silver nitrate to harden to form a silver film, then applying solvent naphtha to said film and said resist to open the silver film and remove the resist.

4. That method of mirror making which comprises forming a design by means of a soluble paste, on the rear surface of a sheet of transparent material, such as glass, silvering the entire rear surface of said sheet, applying a liquid to the silvering and paste to remove the paste, then flowing color film into the places formerly occupied by the paste and then applying a suitable coating over the entire surface of the silvering and color film.

5. That method of ornamenting the rear surface of a translucent object which comprises forming the desired design on said rear surface by means of a paste, then silvering the rear surface of said object, then applying a solvent to the paste and silver film near the paste to dissolve the paste, then applying a color film to the portions formerly occupied by the paste and then applying a suitable protective coating over the entire rear surface of the object.

6. That method of mirror making which comprises forming a design on the rear surface of a sheet of transparent material by means of a paste, then silvering the rear surface of the sheet, then

applying a solvent to remove the paste, then flowing a color film onto the spaces formerly occupied by the paste, then allowing the color film to dry to form a film and then placing a protective coating over the silver and the color.

7. That method of ornamenting hyaline substances which comprises forming a design on one side of the substance with a paste, silvering the side having the design thereon, applying a solvent to remove the paste, then flowing a color film into the spaces formerly occupied by the paste.

8. That method of ornamenting hyaline substances which comprises forming a design on one surface of the substance from a suitable material,

silvering said surface, applying a solvent to the silver and the material to dissolve the material, then applying a liquid film to the spaces formerly occupied by the material.

9. That method of ornamenting transparent sheets of material which comprises forming a design on one surface of the sheet with a soluble material then applying a silver film to said one surface, then subjecting the soluble material to a solvent to remove the same from the sheet to leave an ornamental unsilvered portion on said surface of said sheet.

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