Jan. 19, 1932. E. HAVER 1,842,093

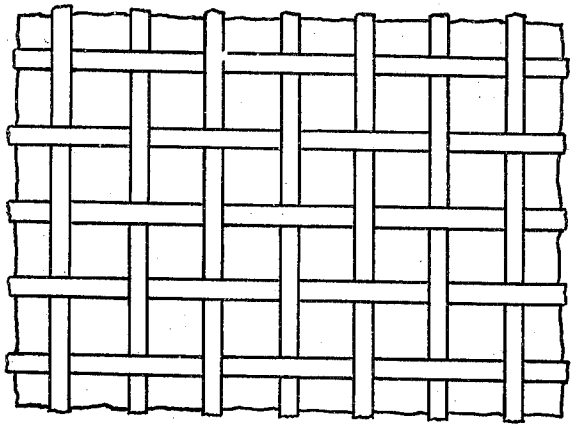
GLASS SUBSTITUTE

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Fig. 1.



Fig. 2.



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GLASS SUBSTITUTE

Application filed February 26, 1931, Serial No. 518,399, and in Germany October 11, 1929.

This invention relates to improvements in glass substitutes of the character disclosed in United States Patent 1,580,287, issued April 13, 1926 to Jules J. Colle et al. and assigned to Acetol Products, Inc., also assignee of the present application.

The form of glass substitute disclosed in the aforesaid patent may comprise covering thin wire fabrics with a transparent film composed of a cellulose ester composition. In doing this it is desirable to have the thickness of the wire as small as possible, in order to obtain a transparent surface as large as possible. Here the determining factor for the choice of the thickness of wire is not so much the strength of the wire, since no great strains occur and the strength of the wire fabric is essentially increased by the cellulose covering, but rather the strength of the texture of the wire fabric. This texture strength depends on the friction between the single wires of the fabric, and this again on the ratio of the thickness of wire employed to the width of mesh; actually with increasing width of mesh the thickness of the wire must be increased in order to obtain a sufficient strength of texture.

The usual wire fabrics consist mostly of wires of round cross-section which always cross one another at a right angle and thus touch one another at the points of crossing to a comparatively small extent and almost in a point. By the crinkling of the wires produced in the weaving process, the wires are pressed up to one another under tension, and so consolidate the texture of the fabric. Such a crinkling gives a rough (undulated) fabric surface which is disadvantageous for the production of glass substitute for various reasons; firstly it is difficult to cover the wire fabric completely with the cellulose layer avoiding blank (uncoated) places which tend to become rusty, as the cross-section of the fabric is very great at the crossing places (intersections) on account of the wires lying above one another at those places, while in view of the high price of the cellulose mass the cellulose layer between the wires must be kept as thin as possible, but on the other hand when the cellulose layer between the meshes is thinner than the thickness of the wire fabric at the intersections of the wires dust and drops of water easily settle in the low-lying squares of cellulose, especially with glass sheets stretched in an inclined or horizontal position. A striking example of water collecting in the undulated portions of the film is found when the product is used for cold frames; there the frames are laid flat and the dew settles in the miniature cavities formed between the meshes without being able to flow away. The attempted embedding of cheaper filling material in the wire fabric meshes, in order to remove this objection, has been found to be without advantage, since the cellulose soon peeled away.

It is an object of my invention to strengthen the texture of the coated wire fabric by increasing the friction between the crinkled wires through producing larger bearing surfaces at their points of crossing.

Another object is to reduce the thickness of the strands of wire composing the base, so that the cellulose layer formed from the coating solution will be substantially the same thickness as that of the wires at their points of intersection.

A further object of the invention is to provide a wire fabric, which when covered with a cellulose layer, will have considerably greater flexibility and power of yielding than the previous usual forms of glass substitutes embodying a wire screen base, the strands of which are round in cross-section.

Other objects of the invention will manifest themselves upon a reading of the specification.

Referring to the accompanying drawings;

Fig. 1 is a cross-section of a product made in accordance with the present invention;

Fig. 2 is a plan view of Fig. 1.

In the form of glass substitute disclosed in the aforesaid Colle et al. Patent 1,580,287, there is used as a carrier for the cellulose mass a fabric consisting of round wires, the cross-section of which, especially at the points of crossing of the wires, appears very thick in comparison to the cellulose layer. The cellulose layer certainly combines the single wires with one another and thus fills

out the squares between the wires, but with the thick fabric cross-section it can hardly be applied in such a way that the highest places of the wires are surrounded by the cellulose mass. In any case the cellulose layer must be very thick at the crossing places of the wires if the latter are to be actually covered.

The form of glass substitute made in accordance with the present invention and illustrated in Figs. 1 and 2 consists of flat-rolled wires combined with one another to form a fabric and covered with a cellulose layer. In this form of the glass substitute the cellulose layer is just as thick as the wires and thus surrounds them securely and prevents the occurrence of blank places giving rise to rusting. In addition, the glass substitute made with such flat wires has a considerably greater flexibility and power of yielding than the previously usual forms of glass substitutes containing the thicker wire fabric, because the thinner wires oppose less resistance to bending and are returned to their original position by the springiness of the cellulose layer.

For the cellulose layer or covering for the wire fabric any solution having a cellulose base will be satisfactory; one such solution being disclosed in the aforesaid Colle et al. Patent 1,580,287. A composition suggested in said patent may consist of cellulose acetate and a plasticizer dissolved in a suitable solvent. As set forth in said patent the cellulose acetate solution may be applied to the wire fabric in any suitable manner such as flowed or brushed thereon although preference is given to using a machine in which the metallic base is dipped in the solution. It is obvious that any excess of the cellulose mass may be removed as by wiping.

The advantages of the glass substitute with a flat-wire fabric base according to the invention are briefly summarized as follows:—

As a result of the small amount of crinkling of the wires, there is in the preparation of the glass substitute sufficient cellulose mass lying above the wires, even after wiping off the mass, to still cover the whole fabric after drying. Any dust clinging on is washed off again by the rain, as there are no hollows in the film where it can settle. The dew forming on the glass substitute with horizontally placed forcing frames or greenhouses flows off by itself, so that the transparency of the glass to light always remains equally good.

A wire fabric base composed of wires rolled flat has a great mesh strength even with thin wires, as the wires which cross one another at right angles have greater contact surfaces, so that the number of places at which the wires are crinkled can be made less than with round wires, thus making possible a greater width of mesh. When such a base is covered with a cellulose layer the resulting product has great texture strength.

Certain modifications will suggest themselves to those skilled in the art. As for example, instead of making the wire fabric of wires rolled flat for their entire length, they can also be made of round wires which are flattened only at the points of intersection. This may be done by means of tooth-like projections on the rollers or by similar means. Again, a fabric of large mesh width, consisting of round wires, can be rolled flat and in this way attain the desired strength of texture, as well as possess the other features of the invention. It is contemplated to cover all such modifications as come within the terms of the appended claims.

I claim:

1. A glass substitute comprising a reticular metallic base composed of flat wires coated with a flexible transparent film, the thickness of the film being substantially the same thickness as the wires forming the base.

2. A glass substitute comprising a reticular metallic base composed of woven flat wires coated with a flexible transparent film, the thickness of the film being substantially the same thickness as the wires forming the base.

In testimony whereof I affix my signature.

ERICH HAVER.