UNITED STATES PATENT OFFICE.

EDOUARD BENEDICTUS, OF PARIS, FRANCE.

REINFORCED GLASS AND ITS MANUFACTURE.

1,128,094.


To all whom it may concern:

Be it known that I, EDOUARD BENEDICTUS, of 25 Rue Fourcroy, Paris, France, artistic painter, have invented certain new and useful Improvements in Reinforced Glass and its Manufacture, of which the following is a full, clear, and exact description.

In the specification of my patent application Serial Number 576,337 filed January 11th, 1910, I have described a strengthened glass composed of sheets of glass united by the interposition and sticking between them of a sheet of celluloid previously coated with a suitable solvent.

Practice has shown that in order to obtain a product having the requisite quantities from a three-fold point of view of perfect and permanent transparency, resistance to shocks and to perforation, and lastly,—in case of breakage,—of adherence of the fragments of glass to the celluloid it is indispensable first to soften sufficiently under the action of the solvent the faces of the sheet of celluloid to enable it to mold itself upon the glass and, secondly, to expel the solvent completely after it has produced its effect. The pressure, mentioned in that previous specification allows the result to be obtained only by means of very delicate and expensive manipulations. It is necessary to employ a hydraulic press and to attain considerable pressures in order to expel the solvent and from this arises the necessity of having a material of high price, a costly working and liability to wastage because of the breakage of the glass subjected to pressure, if special precautions be not taken. The expelling of the solvent cannot, moreover, be realized in a thoroughly complete manner if the celluloid has been imbued with an excess of solvent; further, this latter cannot be recovered in a practical manner. Lastly, the process by pressure is inapplicable to the sticking of curved, arched or convex glass.

The improvement which forms the subject of the present invention, consists in substituting for pressure the action of a vacuum for the purpose of expelling the solvent to the last traces and permitting the recovery of the solvent.

In the accompanying drawing I have illustrated in vertical section two sheets of glass b—b' reinforced by the interposition of a sheet of celluloid c in accordance with my process.

By way of example, I may in practice carry out the new process by means of a vacuum in the following manner: In a receiver filled with volatile solvent (acetone, amyl acetate, &c.) I dip in succession in such a way that they are superposed in the proper order the sheets of glass and the sheet of celluloid. After an immersion for some seconds, I remove the whole together, I allow it to drain or drip and place it in a closed chamber where a vacuum is formed by any suitable means. After the excess solvent and confined air, if any, have been expelled and while the faces of the celluloid are still pasty from the action of the solvent, air is again admitted to the receiver and the atmospheric pressure exerted against the exposed faces of the sheets presses the latter together firmly and insures a perfect joint. It is not necessary to carry the rarefaction to an absolute vacuum; experiments show that a vacuum of 150 millimeters of mercury may be sufficient. The higher the vacuum is carried the more rapid is the operation; it may be further accelerated by the action of heat. It is preferred to act suddenly by the vacuum. The vapors of the solvent which have been liberated under the action of the vacuum may be drawn off into a reservoir wherein they are recovered by condensation.

In place of celluloid I may employ viscose, or other products having a celluloid base, or, again, casein, gelatin and in general any product capable of being put into the form of transparent or translucent sheets, non-brittle but able to be softened by a suitable solvent. In case of viscose and gelatin, for instance, this solvent is simply hot water.

Having thus described my invention, what I claim as such and desire to secure by Letters Patent is:—

1. A method of making reinforced glass, which consists in softening the surface of a sheet of binding material by means of a volatile solvent, sandwiching such sheet between sheets of glass, subjecting the thus juxtaposed sheets to a vacuum to remove excess solvent, and then subjecting the sheets to atmospheric pressure while the surface of the binding material is still pasty under the influence of the solvent whereby the sheets are firmly pressed together, substantially as described.

2. A method of making reinforced glass, which consists in softening the surface of a sheet of binding material by means of a
volatile solvent, sandwiching such sheet between sheets of glass, subjecting the thus juxtaposed sheets to a vacuum in the presence of heat to remove excess solvent, and then subjecting the sheets to atmospheric pressure while the surface of the binding material is still pasty under the influence of the solvent, whereby the sheets are firmly pressed together, substantially as described.

3. A method of making reinforced glass, which consists in softening the surface of a sheet of celluloid by means of a volatile solvent, sandwiching such sheet between sheets of glass, subjecting the thus juxtaposed sheets to a vacuum to remove excess solvent, and then subjecting the sheets to atmospheric pressure while the surface of the binding material is still pasty under the influence of the solvent, whereby the sheets are firmly pressed together, substantially as described.

4. As a new article of manufacture, curved sheets of glass nested together and between them a sheet of celluloid autogenetically united thereto by pressure during the plasticity of the juxtaposed surfaces of the celluloid under the influence of a volatile solvent.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

EDOUARD BENEDICTUS.

Witnesses:

CHARLES DONY,

H. C. COXE.