Oct. 31, 1950 F. WEINBERG 2,528,200

METHOD OF MAKING DECORATIVE EXTRUDED MATERIAL

Filed Sept. 15, 1948

Fig. 1

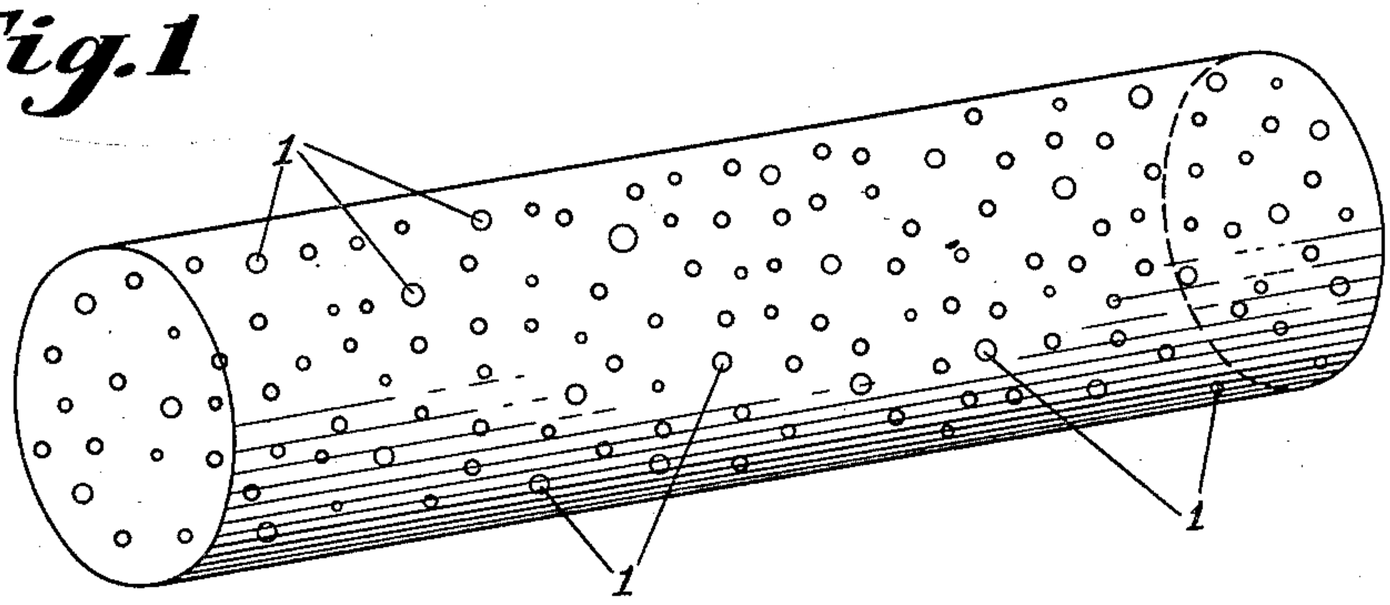


Fig. 2

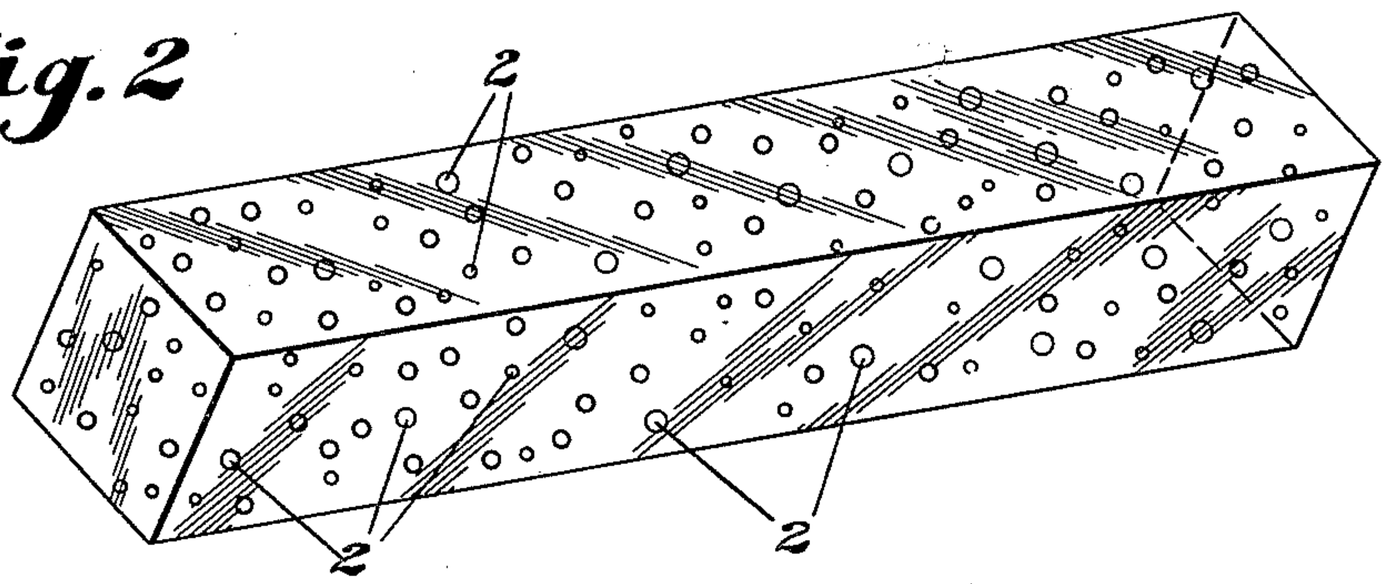


Fig. 3

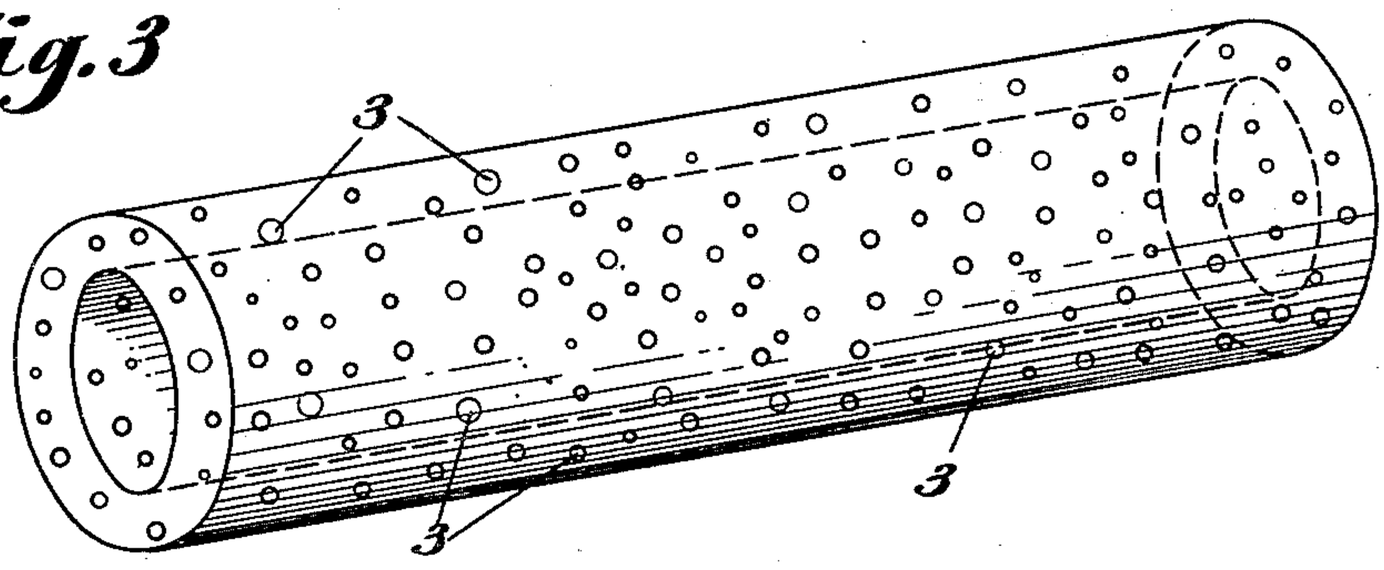
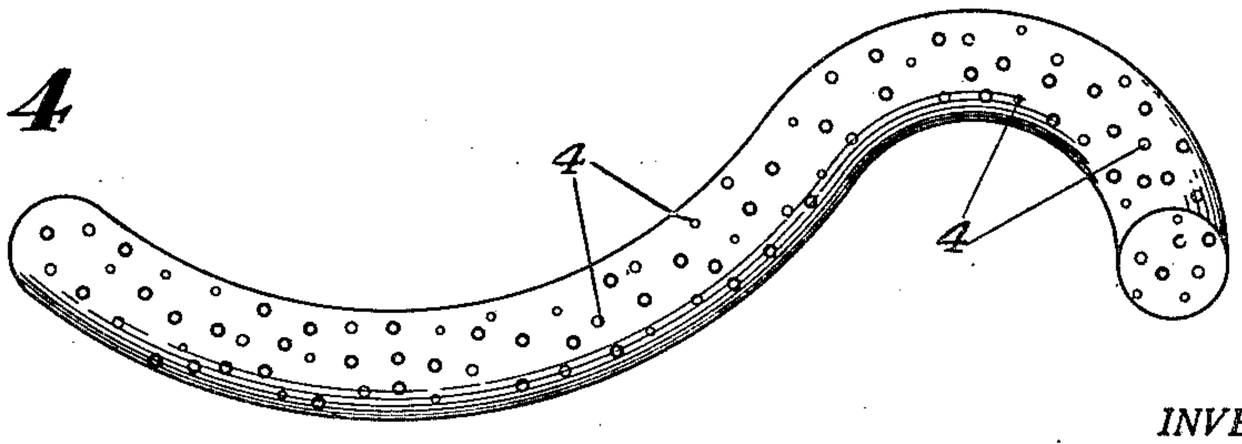


Fig. 4



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METHOD OF MAKING DECORATIVE EXTRUDED MATERIAL

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2 Claims. (Cl. 18—55)

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The present invention relates to a method of making decorative and ornamental materials, and has for its primary object the production of articles, preferably but not necessarily, in the form of slabs, bars, rods, tubes and other elongated shapes, characterized by highly artistic, decorative and ornamental effects which render them exceedingly well adapted for use wherever such effects are desired, as for example in the fields of advertising, display work and giftware.

Another important object is to produce clear transparent or translucent articles capable of absorbing and reflecting light with a glowing and/or brilliant effect without impairment of their light transmitting properties.

The term "substantially transparent material" is intended to cover materials which are either transparent or translucent.

Another object of considerable importance is to produce articles of the foregoing type which do not require any expensive, complicated or extensive changes in existing or conventional equipment for their manufacture, which can be readily produced in very large quantities by relatively simple procedures, and which are particularly well adapted for a wide range of useful applications wherever highly artistic, decorative and ornamental effects are desired.

A further important object is the provision of a relatively simple method for producing highly decorative and ornamental articles, which does not require any expensive, complicated or extensive changes in existing or conventional equipment, which can be practiced on a continuous basis as opposed to batch operation, which is exceedingly flexible in that it can be practiced economically on either a large or small scale, and which can be closely controlled so as to produce articles of uniform quality and characteristics, or to duplicate previously produced articles.

The foregoing objects as well as others are attained by incorporating into the article during the manufacturing process a multiplicity of relatively small bubbles distributed in more or less regular arrangement throughout both the thickness and length of the article.

Referring briefly to the drawings:

Figure 1 is a perspective view of a length of cylindrical rod made in accordance with the teachings of the invention;

Figure 2 is a perspective view of a length of rectangular form;

Figure 3 is a perspective view of a length of cylindrical tubing; and

Figure 4 is a perspective view of a cylindrical

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rod similar to that shown in Figure 1 bent into an ornamental shape.

The product of the invention is an article, preferably but not necessarily of elongated form or configuration such as a slab, bar, rod, or tube of clear transparent or translucent material, containing a multiplicity of small bubbles distributed in more or less regular arrangement throughout both its thickness and length.

In Figure 1, the article is shown as being in the form of a cylindrical rod, the bubbles being denoted by 1. In Figure 2, the article is shown as being in the form of a bar of rectangular cross-section, the air bubbles being indicated by 2. In Figure 3, the article is in the form of a cylindrical tube. The air bubbles are denoted by 3.

The articles of the invention may be made by extrusion or equivalent procedures. By the term "extrusion" is meant methods of molding plastic materials whereby the plastic materials while in heat-softened state are forced through an orifice to produce an elongated article such as a slab, bar, rod or tube of desired cross-section.

The articles may be made of one or more plastic materials, and if made by extruding procedures they are necessarily made of materials capable of being forced through a restricted orifice while in heat-softened condition. Thermoplastic materials are presently preferred over thermosetting materials.

The thermoplastic material may be any one or more of the group of transparent or translucent materials selected from the following:

(1) Acrylic resins, particularly methyl methacrylate.
(2) Cellulose plastics such as cellulose acetate, cellulose acetate-butyrate, ethyl cellulose, etc.
(3) The vinyl plastics such as polyvinyl chloride, polyvinyl chloride-acetate copolymer, polyvinyl acetals, polyvinylidene chloride, etc.
(4) Polyethylene.
(5) Polystyrene.

In actual practice, the methyl methacrylate plastics, which are available on the market in the form of molding powder under the trade-marks "Plexiglas" and "Lucite," are preferred. These materials contain the necessary compounding ingredients such as plasticizers as well as dyes or pigments, and hence require a minimum of preparation on the part of the molder. However, the invention is not restricted to the use of these materials, and any one or more extrudible transparent or translucent thermoplastic or thermosetting materials may be used in carrying out its

teachings. If a mixture of plastic materials is used, it is important that they be compatible.

It is to be noted at this point that the preliminary preparation, compounding or formulation of the molding materials does not constitute an essential part of the present invention. Materials having the necessary properties and characteristics are available on the market, and most of them may be used without any preparation or other preliminary processing except to dry them. Colorless or water-white plastics may be used, but for many applications colored or tinted materials may be used.

The preferred method consists essentially in extruding a mixture of dry and moist thermoplastic material. In this case, it is not necessary to wet the surface of the extruded material as it comes out of the orifice.

In carrying out the presently preferred method, it is absolutely essential that part of the molding powder be thoroughly dry and that the other part be moist. The relative proportions of the dry and moist powders may be varied within a fairly wide range, but generally substantially equal proportions give the desired results. It is preferable, but not absolutely necessary, to utilize the same plastic for both the dry and wet material.

The size, quantity and the arrangement of the bubbles can be varied within fairly wide limits by varying the conditions under which the extrusion is carried out as well as the proportions of dry and moist ingredients. All other factors being kept constant, increasing the temperature or the backpressure in the extruder serves to decrease the size of the bubbles. The backpressure is a function of the rate of feeding the material to the orifice.

The conditions can be varied very easily during the process. A sample run is started using given proportions, temperature, rate of feed, etc. As the extruded material leaves the orifice it can be examined very carefully to determine whether it is necessary to change any one or more of the conditions. For acrylic molding powder, temperatures between 345°–370° F., have given excellent results.

The following is given as an illustrative example:

A batch of acrylic molding powder is dried for a period of four hours under an infra red lamp. Another batch is heated for a shorter period and then set out in the air to absorb moisture. Two pounds of the dried material is thoroughly mixed with one and a half pounds of the moistened material, and the mixture is fed into a conventional extruding machine at a temperature of 365°–370° F. The extruding machine is run at a given speed with a given feed, and as the extruded material comes off onto the conveying belt, it is examined to determine whether changes are necessary in the proportions, speed of extrusion, speed of feed, temperatures, etc., and the necessary changes are made immediately. A little experimentation may be necessary to ascertain the variables which should be changed and their extent.

The shape of the cross-section may be changed by varying the orifice. As previously indicated, slabs, bars, rods, tubes, or other cross-sectional shapes may be produced. This is true of both of the methods described. In either event, the product is a clear transparent or translucent article of desired cross-sectional shape and dimensions containing a multiplicity of small bubbles in more or less regular arrangement throughout the length and thickness of the material. These bubbles glow brilliantly without impairing to any substantial extent the transmission of light. In the case of colored or tinted thermoplastic material, the bubbles remain colorless, thereby emphasizing the glowing effect of the bubbles. In the case of tubular configurations, additional pleasing visual effects are produced by the thickness of the wall.

The products of the invention may be used in various ways in the advertising, decorative and giftware fields. The application of these products in these and other fields is not part of the present invention. However, for illustrative purposes, there is shown in Figure 4 of the drawing a rod made in accordance with the present invention which has been bent into an ornamental curved shape, the bubbles being indicated by the numeral **4**.

The foregoing description has been given by way of illustration, and is not intended to restrict the invention beyond the requirements imposed by the state of the prior art, particularly since numerous changes, modifications and additions may be made in the disclosed specific embodiments without departing from the underlying or directing concept of the invention.

I claim:

1. A method of making a decorative material which comprises mixing a dry substantially transparent extrudible material with a moistened substantially transparent extrudible material, and extruding the mixture.

2. A method of making a decorative material which comprises mixing a dry and a moistened acrylic resin in powdered form, and extruding the mixture.

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