

PUBLISHED
APRIL 27, 1943.
BY A. P. C.

D. SWAROVSKI
METHOD OF MASS PRODUCTION OF OBJECTS
FORMED OF MOLDABLE MATERIAL HAVING
EMBEDDED A PLURALITY OF SMALL PIECES
Filed March 4, 1940

Serial No.
322,152

Fig. 1

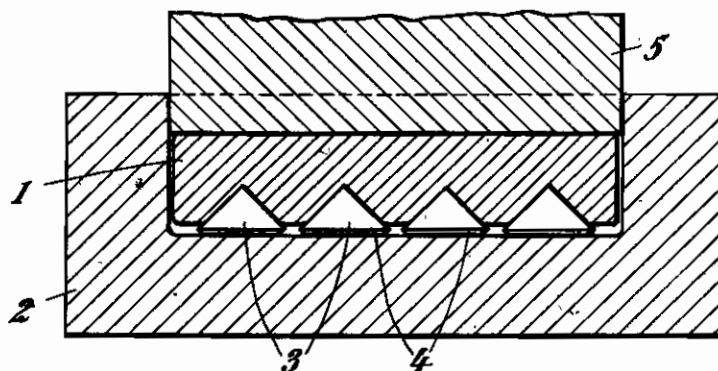
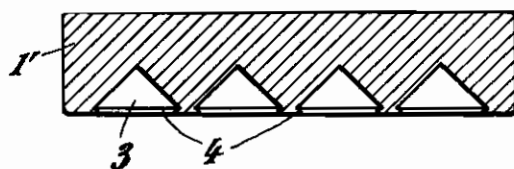


Fig. 2



INVENTOR

DANIEL SWAROVSKI.

BY

Karl A. Mayr.

ATTORNEY

ALIEN PROPERTY CUSTODIAN

METHOD OF MASS PRODUCTION OF OBJECTS FORMED OF MOLDABLE MATERIAL HAVING EMBEDDED A PLURALITY OF SMALL PIECES

Daniel Swarovski, Wattens, Tyrol, Germany;
vested in the Alien Property Custodian

Application filed March 4, 1940

The present invention relates to a method of mass production of objects formed of moldable material having a plurality of small pieces made of other material embedded into this moldable material the upper surface of which pieces partially is freely supported. The object of the invention is to simplify the usual operation of producing such objects. As is well known these objects hitherto are made in such a manner, that the pieces to be embedded, consisting for instance of glass, metal, artificial stone masses and the like, which individually only form a fracture of the object to be deformed are inserted in a mold suitable for forming the object and are secured in the desired position by holding means, whereupon the deformable mass is introduced into the mold by a press-, press casting, or casting method so as to cover the pieces to be embedded leaving free some visible surfaces only and holding these pieces after solidification. This holding may be effected either by the adhesive capacity of the pieces embedded in the mass or thereby that the mass partially overlaps the edge of the pieces. The holding devices mentioned above which, owing to the plurality of pieces to be embedded, are formed in the manner of a grate cannot simply be applied but must themselves be held in their position to be able to completely fulfil their purpose, because otherwise on the mass penetrating into the mold the pieces to be embedded together with the holding devices are lifted and displaced out of their predetermined position.

The object of the invention is to render superfluous such special holding devices which, moreover, must remain in the mass and therefore are lost. According to the invention the pieces to be embedded are loosely inserted in cavities or recesses of a preformed body nearly corresponding in form to the final shape of the object. The mass of this preformed body later on forms the holder of the pieces. The body is then pressed in a mold corresponding to its final shape for tightly and permanently connecting the pieces to be embedded with the body. In this manner the operation also is carried out with the use of a holding device, but the latter is formed by the object to be produced itself, because the forming is effected in two stages which has the further advantage that the first forming operation may be carried out absolutely independent on the pieces to be embedded. The supposition for the operation according to the invention is, of course, that the preformed body may be subjected to a final forming which for instance al-

ways is possible by the use of so-called hot plastic masses. Therefore, for carrying out the method according to the invention particularly materials come into consideration which are rendered plastic on heating, further the so-called masses capable of being hardened when heated, i. e. such materials capable of being worked in a hot state and which may be hardened by an additional supply of heat.

The method according to the invention is particularly adapted for the manufacture of objects into which a plurality of other pieces is to be embedded, as for instance jewelries ingemmed with glass stones, metal decorations or other decorative bodies, light signals with individually embedded reflecting elements and so on.

If it is possible with regard to other points of view, the surface of the pieces to be embedded which is to be covered by the formable mass and the cavities or recesses of the preformed body preferably are of such a form that the insertion of the pieces into the recesses or cavities in mass production may easily be carried out as this may be effected by putting the pieces upon the front side of the preformed body, shaking the pieces into the depressions and aligning the insertions by smoothing down. The body preformed in a cold or hot state is then placed together with the inserted pieces into one half of a mold which for instance may be effected by tilting over the lower part of the mold and subsequent inversion of the latter, whereupon the upper portion of the mold is placed in position and pressure is exerted by which the preformed body obtains the final shape of the object to be produced.

In the accompanying drawing the invention is shown by way of example.

In this drawing:

Fig. 1 shows a section through a mold together with a preformed body and the inserted pieces in the moment before the final forming of the object, and

Fig. 2 is a section through the finished object.

The object to be produced has according to Fig. 2 the form of a plate in the front side of which rows of decorative bodies or the like are to be embedded the plane upper surfaces of which are arranged flush with the upper surface of the plate. As may be seen from Fig. 1 the preformed body 1 already has substantially the form of the plate to be produced and is provided with recesses or cavities for the insertion of the pieces to be embedded. With the same volume this body is somewhat smaller and therefore higher so that it may easily be inserted into the lower

portion 2 of the mold. The pieces 3 to be embedded which in the present case are arranged one adjacent the other with a small space between each two pieces are prisms or cones the bases of which after insertion of the pieces into the recesses or cavities project somewhat from the front surface of the body 1. The edges of the base surfaces of the pieces 3 resting upon the bottom of the mold are ground by forming of facets 4 so that between the pieces 3 and the opposite wall of the mold additional hollow spaces are formed corresponding to the removed edges.

During final pressing of the body 1 by lowering the plunger 5, forming the upper portion of the mold, all hollow spaces of the form are filled, whereby the mass overlaps the facets and the pieces 3 are particularly safely held and tightly embedded as may be seen from the finished plate 1' shown in Fig. 2.

The final deforming of the preformed body practically may also be effected in the position the body assumes for inserting pieces to be embedded. The preformed body hereby may be introduced into the lower portion of the mold with

the recesses or cavities directed upwardly in which the pieces to be embedded are loosely inserted, the upper portion of the mold brought into position from above during deforming first of all presses upon the pieces to be embedded and forces the mass flowing off below the pieces to be embedded into the still present hollow spaces thereby tightly embedding the pieces. In certain cases it is to be preferred to finally deform the body in the first operation except the embedding side, whereupon in a second operation the mass particles directly surrounding the decorations to be embedded are once more heated, finally deformed under pressure and eventually hardened, if this is necessary for holding the inserted pieces.

It is evident that the method according to the invention has substantial advantages by rendering superfluous special holding devices for the pieces to be embedded, by shortening the period of operation and by excluding influences which may lead to defective work, i. e. circumstances playing a great roll in mass production.

DANIEL SWAROVSKI.