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PROCESS FOR THE PRODUCTION OF SHAPED
STRUCTURES FROM REVERSIBLY MOLDABLE
SYNTHETIC RESIN
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FIG. 1

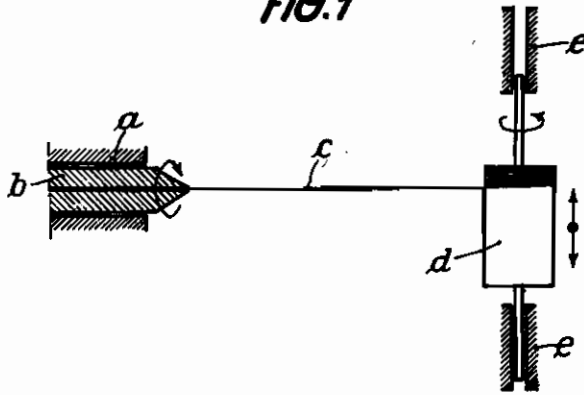
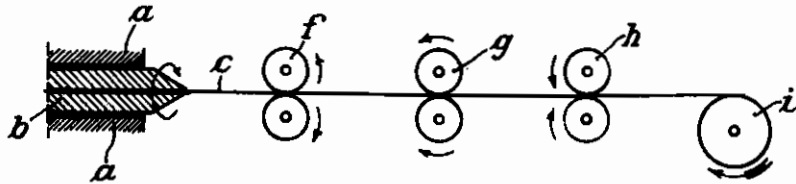


FIG. 2



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PROCESS FOR THE PRODUCTION OF SHAPED STRUCTURES FROM REVERSIBLY MOLDABLE SYNTHETIC RESINS

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This invention relates to the production of shaped structures from reversibly moldable synthetic resins.

It is known to produce shaped structures from synthetic resins, for instance polystyrol, polyvinyl carbazole, in such a manner, that for instance by a drawing process these structures show special orientation in one direction only and therefore special properties with regard to tenacity and pliability.

According to methods hitherto known it was not possible however to produce shaped structures, such as filaments, rods, tubes and the like consisting of preferably linear molecules which exhibit an orientation-effect in several directions.

It is an object of the present invention to manufacture shaped structures from reversibly moldable synthetic resins.

A further object is to produce by special mechanical means an orientation-effect of the resins in different directions, thereby improving the tenacity of the products.

These and other objects will become apparent from the following specification.

The present invention is based on the observation, that it is possible to manufacture shaped structures, such as filaments, rods, tubes and the like by extruding them in a plastic, liquid or dissolved state from a nozzle rotating quickly around its axis, and finally cold drawing said structures in the direction of the extrusion. In this way also these simply shaped structures such as filaments, rods, tubes and the like show an orientation-effect in several directions which greatly improves the tenacity of the product.

The additional drawing of the structure extruded from the nozzle is preferably accomplished in such a manner, that the extruded filament is wound up on a cylinder or roll or on other suitable rotating means, the peripheral speed of which, however, is higher than the speed the filament is discharged with from the nozzle.

The drawing of the filament being extruded from the nozzle may be accomplished according to the present invention also in such a way, that the filament is passed between rolls or cylinders being arranged behind one another, the peripheral speed of which increases from step to step. Repeated drawing occurs hereby according to the groups of rolls, in between which the filament passes, whereby the drawing force may gradually decrease from step to step. By these means an

enhanced drawing effect of the final product and correspondingly a higher orientation effect is obtained.

Reference is made to the accompanying drawing in which Figure 1 is a diagrammatic view of an extruding device using a cylinder to wind up the filament.

Figure 2 represents mechanical drawing means. There is used a plurality of cylinder groups, in between which the extruded filament passes through,

The filament *c* consisting of thermoplastic synthetic resins and being extruded from the nozzle *b* which rotates in the bearings *a*, is wound up in coils on a cylinder *d*. Said cylinder rotates in the bearings *e* with a higher peripheral speed than the corresponding extrusion velocity.

According to Figure 2 the filament *c* leaves the rotating nozzle *b*, passes in between the cylinder groups *f*, *g*, *h* and is finally wound up on a roll *i*. These cylinders *f*, *g*, *h* and the roll *i* are driven with a peripheral speed increasing from the nozzle-opening towards the cylinder *i*, whereby the peripheral speed of the cylinder *f* is already higher than the extrusion velocity of filament *c*. Gradual drawing of the filament or tube is therefore attained between the nozzle-opening and the cylinder group *f* as well as between the cylinder groups *f*, *g*, *h* and the cylinder group *h* and cylinder *i*. By this drawing action in connection with the torsion caused by the rotating nozzle, there is accomplished an orientation effect which is characterized by a considerably improved tenacity of the particular products.

According to the present invention there may be worked up all synthetic resins possessing preferably a linear structure of the polymeric molecules. To these synthetic products there belong especially the polymerisates or interpolymerisates of vinyl chloride, vinyl acetate, vinyl alcohol, vinyl carbazole, maleic acid anhydride, isobutylene and similar compounds. By the present invention there is attained on all these materials an orientation effect which greatly improves their tenacity. This is especially true for the superpoly-condensates which according to this invention represent a most suitable material, such as the superpolyamides and polyamide condensation products which are obtainable either from dibasic acids and dibasic amines or from aminocarboxylic acids and their lactames.

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