

UNITED STATES PATENT OFFICE

2,127,896

METHOD OF PRODUCING ELASTIC OBJECTS
FROM POLYVINYL ALCOHOLS

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No Drawing. Application January 14, 1937, Se-
rial No. 120,635. In Germany August 13,
1936

7 Claims. (Cl. 18-55)

My invention relates to the production of elastic articles from a polyvinyl alcohol.

Hitherto elastic articles, f. e. hoses, threads, bands, packings, membranes, etc., have been produced from polyvinyl alcohols insoluble in cold water by pressing a mixture of polyvinyl alcohol and softening agents, and a quantity of water exceeding the quantity which the used softening agents are able to withhold at temperatures from 70 to 130° C. Thereafter the ready article had to be freed from the excess of water contained therein by drying and this process caused a certain shrinkage of the article. As the drying process may, according to the form of the article, take up to several days, and as the shrinkage can not be exactly predetermined so that the size of the article in its final form is often different from the desired size, the use of an excess of water is not only very disadvantageous but it makes it even impossible to produce articles having a considerable wall thickness as the drying of such articles would take an economically unbearable space of time.

It has been proposed to replace the excess of water by a surplus of softening agents, however, herewith the high percentage of softening agents in the articles caused such a strong "sweating" of them in moist air that this process could not be used in practice.

Now I have found that the usual mixture of a polyvinyl alcohol with 15 to 50 parts by weight of softening agents can be used for producing elastic articles even without any water or with just that quantity of water which the softening agents are able to withhold, if the temperature at which the pressing is effected, is raised to between 135 and 180° C. The pulverized mixture of polyvinyl alcohol and softening agents can either be worked at this temperature into a kneadable caoutchouc-like mass and then be pressed into the desired form, or it can be formed in the cold state and then be pressed at the above mentioned temperature. In both cases articles of any form and with any desired wall-thickness can be obtained which do not need any drying but are completely finished as soon as they leave the press. The pressing operation can be performed by means of a worm-press or piston-press in order to enable the continuous production of hoses, bands and threads; or a stamping-press may be used for producing packings, membranes and the like. The production of the last mentioned articles can also be effected by the known die casting process.

In producing articles from polyvinyl alcohols according to my method the same organic or in-

organic filling substances may be used as with the known methods; they may be soluble in water and glycerin or insoluble. If soluble filling substances are used, such as glue, starch, dextrin or the like, then the percentage of softening agents admixed to the polyvinyl alcohol must be increased according to the added quantity of filling substances.

The composition of the mixtures to be used with the method according to the invention shall be illustrated by the following examples:

I. 60 parts by weight of polyvinyl alcohol, 40 parts by weight of glycerin.

II. 55 parts by weight of polyvinyl alcohol, 10 parts by weight of a 50% solution of glue in water, 35 parts by weight of ethylene-glycol.

III. 40 parts by weight of polyvinyl alcohol, 20 parts by weight of starch, 10 parts by weight of a 50% solution of glue in water, 30 parts by weight of glycerin.

IV. 25 parts by weight of polyvinyl alcohol, 25 parts by weight of starch, 25 parts by weight of inorganic filling substances, and 25 parts by weight of glycerin.

What I claim is:

1. A method of producing elastic objects from polyvinyl alcohols comprising preparing a mixture containing a polyvinyl alcohol, 15 to 50% by weight of softening agents and not more water than the quantity of softening agent present in the mixture is able to withhold, working up such mixture into a kneadable mass, pressing such mass into the desired form and heating such pressed mass to a temperature of 135 to 180° C.

2. A method according to claim 1 in which said mixture is worked up into a kneadable mass at a temperature between 135 and 180° C. prior to the pressing operation.

3. A method of producing elastic objects from polyvinyl alcohols comprising preparing a mixture containing a polyvinyl alcohol, 15 to 50% by weight of softening agents and not more water than the quantity of softening agent present in the mixture is able to withhold, working up such mixture into a kneadable mass, shaping such mass into the desired form in the cold state and subsequently subjecting such shaped mass to pressure at a temperature between 135 and 180° C.

4. A method of producing elastic objects from polyvinyl alcohols comprising preparing a mixture containing a polyvinyl alcohol, 15 to 50% by weight of softening agents, organic filling substances, and not more water than the quantity of softening agent present in the mixture is able to withhold, working up such mixture into a knead-

able mass, pressing such mass into the desired form and heating such pressed mass to a temperature of 135 to 180° C.

- 5 A method of producing elastic objects from polyvinyl alcohols comprising preparing a mixture containing a polyvinyl alcohol, 15 to 50% by weight of softening agents, inorganic filling substances, and not more water than the quantity of softening agent present in the mixture is able
10 to withhold, working up such mixture into a

kneadable mass, pressing such mass into the desired form and heating such pressed mass to a temperature of 135 to 180° C.

6. A method according to claim 1 in which said mixture is pressed by the die casting process. 5

7. A method according to claim 1 in which said mixture is pressed by extrusion through a heated nozzle.

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