

UNITED STATES PATENT OFFICE

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MANUFACTURE OF HOLLOW ARTIFICIAL THREADS

No Drawing. Application filed December 9, 1927, Serial No. 239,005, and in Czechoslovakia December 21, 1926.

In my U. S. A. patent application Ser. No. 132,043, filed August 27, 1926, a process is described for the manufacture of hollow artificial textile threads, according to which liquid or solid substances are incorporated in the solution to be spun, in a fine and uniform division, if desired in a state of colloidal division. These solid or liquid substances during the whole subsequent process of spinning and finishing of the threads, do not generate any bubble-forming vapours or gases and may be caused to separate successfully in a state of fine division only during the process of spinning. In any case, the substances incorporated are subsequently eliminated again from the textile threads by means of suitable solvents, so that the place of the incorporated substances is taken by uniformly and exceedingly finely distributed bubbles, and in this way are obtained hollow threads of great softness and of small heat conductivity.

New experiments have shown that the subsequent removal or elimination of the incorporated substances may also be obtained in an advantageous manner by the action of a vacuum, so that the process is thus considerably cheapened owing to the saving of the otherwise required solvent. If the substances incorporated have a high boiling point, it is necessary to expose the textile threads to the action of a vacuum at a higher temperature. As is well known, the lowering of the boiling temperature in the case of the decrease of the outer pressure to one and the same amount, is much smaller in the case of higher pressures than in the case of low pressures, from which it follows that the action of a reduction of pressure at pressures already low in themselves, is quite extraordinarily large.

If for instance a petroleum fraction or some other hydrocarbon with a boiling point 200° has been incorporated, the boiling point at a pressure of 660 mm. mercury column will still be about 130°, on the contrary at a pressure of 20 mm. it will be only 80-90°, at a

pressure of 10 mm., about 75°. With the assistance of a very high vacuum, it is therefore possible to reduce the temperature of distillation even of substances with a high boiling point, for instance oils, to quite an extraordinary extent, and even substances which volatilize with difficulty, may be completely eliminated again from the textile threads, hollow spaces being formed, whilst in the case of easily volatile substances, this may be done with the assistance of a vacuum, without any heating.

I claim:

1. A process for the manufacture of porous artificial textile filaments from spinning solutions such as viscose, ammoniacal copper oxide, cellulose acetate, and nitro-cellulose solutions, and in which solutions there are incorporated normally non-volatile substances which during the second process of spinning and finishing of the filaments, do not generate any bubbles forming vapors or gases, which process includes the step of removing the incorporated substances by subjecting the filaments to vacuum, whereby to effect the evaporation of the incorporated substances and to leave, void, the porous spaces previously occupied by the substances.

2. A process for the manufacture of porous artificial textile filaments from spinning solutions such as viscose, ammoniacal copper oxide, cellulose acetate, and nitro-cellulose solutions, and in which solutions there are incorporated substances such as petroleum fractions or other hydrocarbons possessing a high boiling point and, therefore, normally non-volatile, which process includes the step of removing the incorporated substances by subjecting the filaments to heat and vacuum whereby to effect evaporation of the incorporated substances and to leave, void, the porous spaces previously occupied by the substances.

3. A process for the manufacture of porous artificial textile filaments from spinning solutions such as viscose, ammoniacal copper

oxide, cellulose acetate, and nitro-cellulose solutions, and in which solutions there are incorporated substances such as petroleum fractions or other hydrocarbons possessing a high boiling point and, therefore, normally non-volatile, which process includes the step of removing the incorporated substances by subjecting the filaments to heat and vacuum whereby to effect vacuum of the incorporated substances and to leave, void, the porous spaces previously occupied by the substances, the degree of vacuum being the inverse ratio to the boiling point of the substances.

In testimony whereof I affix my signature.

HANS KARPLUS.

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