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MANUFACTURE OF HOLLOW ARTIFICIAL TEXTILE THREADS.

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It is already known to produce hollow artificial textile threads by spinning solutions in which gases are emulsioned or dissolved, or into which a substance has been introduced which, like for instance sodium carbonate, on leaving the spinning nozzle can produce gas bubbles in the fibre under the chemical action of the precipitation bath, or which, like emulsioned volatile substances, for instance carbon sulphide, petroleum, benzin, benzol, on the spinning solution escaping into the warm precipitation bath or during subsequent heat action, generates bubble-forming vapours. By this well known process are obtained directly threads or the like in which are occluded gas bubbles. It is known that the hollow threads or bubble threads thus produced, have the great drawback that for instance when treated with warm baths or when dried in warm air, as is unavoidable for the finishing of the textile material, they do not withstand well the action of such increased temperatures, the gas bubbles already contained in the freshly spun thread, expanding namely to a great extent during such treatment in the heat and causing frequent bursting, that is to say the enclosing fibre layer is broken by the expanding gas bubbles.

It has now been found that hollow artificial textile structures can be obtained without these heavy drawbacks, by incorporating in the spinning solutions liquid or solid substances which during the whole of the following spinning and finishing process, cannot develop any bubble-forming vapour or gases, namely neither under any thermic nor chemical action. Owing to the absence of this vapour or gas generation, the risk of a bursting of the gas bubbles occluded in the thread is avoided. The substances incorporated are removed from the spun thread only subsequently, namely by dissolving them out with a suitable solvent. As the spinning solutions there could be used any cellulose solution, such as viscose and copper-oxide-ammonia solutions, further solutions of nitrocellulose and acetyl cellulose.

The process is carried out by finely distributing solid or liquid substances which are insoluble to a large extent or completely in the spinning solutions, in the said solutions if necessary to the colloidal "dispersity" degree. As substances suitable for the present process, that is to say which do not generate during the process of manufacture of the threads any bubble forming vapour or gases in the said threads either under the thermic or chemical action, may be mentioned by way of example, for the viscose process; mineral, animal or vegetable oils such as lubricating oil, paraffin oil; further mineral, vegetable and animal fats, waxes and the like, further solid paraffin, metal soaps, fatty acids, naphthenic acids, resins. Such substances can be easily emulsioned or suspended in the spinning solution in a state of such a fine division that the spinning process is in no way affected by their presence. The spun threads are submitted in the well known manner to a subsequent treatment and the incorporated substances are finally removed by dissolving them out by means of a suitable solvent. This dissolving out of the incorporated substances from the thread could also take place before it is finished.

The process could also be carried out by dissolving in the spinning solutions additional substances which lead to the separation of finely distributed or divided liquid or solid substances within the threads only during the spinning process, more particularly under the chemical action of the precipitation bath. These added substances, or these substances separating in a state of fine division, must be again chosen in such a manner that a vapour or gas generation during the process of manufacture of the threads is avoided. When employing viscose as the spinning solution, as additional substances, could be used for instance alkali salts of fatty acids, resinic acids or their hydroxylized or sulphonated products. These additional substances, first dissolved in the viscose, are decomposed only by the action of the precipitation bath and separate free fatty acids, resinic acids etc., in a finely divided state. The addition of soaps to the viscose has already been recommended, but the substances separated by the decomposing precipitation bath, are retained completely or to a large extent in the thread. According to the present process however, these separated, finely divided substances, are subsequently dissolved out again by means of a suitable solvent such as for instance organic solvents, or by a sufficient treatment with alkaline baths, in order to enable the desired hollow cells or bubbles to be produced in the thread.

Example 1.—22 gr. bone oil or paraffin oil

are finely emulsioned in 400 gr. of viscose. The spinning solution obtained is spun in the well known manner in acid salt baths, the threads obtained are washed and dried. The incorporated oil particles are then extracted by means of benzol, carbon sulphide, amyl alcohol. A textile thread of great lightness and softness is then produced, permeated by hollow spaces and showing good structure and strength.

Example 2.—25 gr. sodium oleate are dissolved in 400 gr. of viscose. The spinning solution obtained is spun as set forth in the Example 1, and submitted to subsequent treatment. The oleic acid separated in the thread produced in a state of fine division, by the action of the precipitating bath is dissolved out by benzin or by a 5% solution of soda lye.

I claim:

1. A process for the manufacture of hollow artificial textile threads of interior hollow cellular structure from spinning solutions of any desired kind such as for instance, viscose, copper-oxide-ammonia, cellulose-acetate, nitro-cellulose solutions, comprising incorporating into the solution to be spun, liquid or solid organic, non-crystalline substances which, during the whole following spinning and finishing process of the threads, cannot form any bubble-forming vapours or gases, and subsequently removing the said substances from the textile threads by means of suitable solvents.

2. A step in the process as claimed in claim 1, comprising distributing the substances incorporated in the spinning solution as emulsions or suspensions in said solution, eventually up to colloidal fineness.

In testimony whereof I have signed my name to this specification.

HANS KARPLUS.