UNITED STATES PATENT OFFICE.

LEON LILIENFELD, OF VIENNA, AUSTRIA-HUNGARY.

PROCESS OF FINISHING, FILLING, LOADING, OR DRESSING TEXTILE FABRICS AND SPUN GOODS.

1,036,282. Specification of Letters Patent. Patented Aug. 20, 1912.

No Drawing. Application filed November 10, 1911. Serial No. 659,594.

To all whom it may concern:

Be it known that I, LEON LILIENFELD, doctor, chemist, a subject of the Emperor of Austria-Hungary, residing at 1 Zeltgasse, Vienna VIII, Austria-Hungary, have invented certain new and useful Improvements in Processes of Finishing, Filling, Loading, or Dressing Textile Fabrics and Spun Goods, of which the following is a specification.

My invention relates to processes of finishing, filling, loading or dressing textile fabrics and spun goods.

When finishing and loading or dressing cotton fabrics with the aid of viscose (cellulosexanthogenate) by itself or mixed with inorganic or organic loading materials or pigments or coloring matter the difficulty is met with that the cellulose or hydrocellulose which is regenerated from the viscose during its decomposition does not penetrate sufficiently into the fibers themselves and consequently is too visible on the surface of the fabric and fills up the meshes of the fabric. The same holds good of threads dressed with viscose in the manner known heretofore, when the cellulose was also regenerated more on the surface than in the interior. The consequence is that the fabric or dressed threads or fabric made of dressed threads finished in the manner known heretofore with viscose alone or with viscose mixed with the above-mentioned substances partially or entirely loses or lose the appearance and touch of the natural, not finished fabric.

A primary object of my invention is to remedy this defect. To this end, the viscose to be employed for finishing or dressing is made so rich in caustic alkalis that its percentage of caustic alkali is at least as great as its percentage of cellulose or cellulose hydrate. I have found that viscose very rich in alkali penetrates very deep into the textile fiber so that fabrics, or dressed threads, or fabrics made of such dressed threads finished with it by itself or mixed with other finishing or dressing agents, or with inorganic or organic loading materials or pigments or coloring matters by themselves or mixed one with another, gain exceedingly in touch, strength and weight, and are not far removed in appearance from, or are equal in appearance to, natural fabric or threads. According to my process it is possible to precipitate very large quantities of cellulose or cellulose hydrates in or on the fiber without considerable formation of superficial layers or layers filling up the meshes and impairing the fabric.

For carrying my process into practice crude viscose or viscose purified according to one of the well-known processes, *e. g.* those using salts, weak acids and salts, alcohols, weak acids and alcohols, other agents which withdraw water, bisulfite lye, sulfurous acid, carbonic acid and other weak acids and the like, and possessing a percentage of alkali amounting at least to as much as its percentage of cellulose or cellulose hydrate, is applied by hand or by means of suitable machines onto the fabric or spun goods to be finished or is incorporated therein. In order that the fibers may be penetrated still deeper this impregnation may take place in rarefied chambers or under an increased pressure. The viscose may have added to it other finishing or dressing agents or loading materials, such as kaolin, oxid of zinc, asbestos, staurolite (Taufstein) and the like, or inorganic or organic pigments, *e. g.* lax, mineral colors and the like, or coloring matter, either by themselves or mixed one with another. The abundance of caustic alkalis can be produced by providing therefor either when manufacturing the viscose, for example by converting the cellulose with the aid of suitably concentrated caustic potash solutions into alkali cellulose and adapting the pressure to which the same is subjected to the percentage of alkali which is finally desired and the like, or by adding to the finished viscose as much caustic alkali in a solid form or in solution as is desired for the purpose in view.

If it is wished to avoid the shrinking of the fabric or spun goods occasioned by the percentage of alkali or to diminish the same, it is preferable to finish or dress the fabric or spun goods or to render the viscose insoluble, *i. e.* to regenerate the cellulose or hydrocellulose, or to liberate the same from impurities by lixiviation or to dry the fabric or spun goods while stretching the same.

The viscose is preferably rendered insoluble (regeneration of the cellulose or hydrocellulose) in known manner, that is to say

by exposing the finished or dressed fabric or spun goods to actions which are capable of decomposing the viscose, cellulose or hydrocellulose being formed. To this end the following agents may be used: steam, dry heat, hot water; acids by themselves or mixed with glycerin, sugar and the like; acids and salts; salts alone, *e. g.* ammonium sulfate, ammonium chlorid, sodium chlorid, sodium bisulfite and the like; salts of heavy metals; agents which withdraw water, such as alcohols and the like. The goods which have been finished or dressed and in which the viscose has been rendered insoluble must then be liberated from the impurities due to the viscose. This is preferably done by a thorough washing process. The material may be washed with only cold or hot water alone or subjected in addition to the washing process to a neutralizing process or one which removes the acid, to which end solutions of inorganic or organic acids or acid salts can be employed. This treatment with an acid or an acid salt can take place either before or after the washing process or between two washing operations. The alkali which passes into the water can be recovered by any process known in the art of mercerization or otherwise.

Examples.

1. 100 parts by weight of a crude viscose containing 10–15% cellulose and 3.5–7% caustic soda are mixed with 30 to 150 parts by weight of a soda lye of 50° Bé. (50%), and a cotton fabric is finished with this mass on a suitable finishing-machine or a cotton thread is dressed on a suitable dressing-machine. The treatment is completed according to one of the processes described above.

2. 10 to 20 parts by weight of china clay or oxid of zinc are added to the mass described in Example 1.

3. 10 to 20 parts by weight of a softening agent, such as glycerin, Turkey red oil, aluminium oleate, polyricinol acid, castor oil, sugar, syrup and the like, are added to the mass described above in Example 1 or 2.

4. 10 to 20 parts by weight of starch or glue dissolved in a suitable quantity of water are added to the mass described above in Examples 1, 2 or 3.

5. Like Examples 1 to 4, but with the difference that, instead of the crude viscose, a solution of a precipitate obtained with the aid of sodium chlorid or ammonium sulfate or chlorid of zinc or alcohol from alcoholic crude viscose or crude viscose neutralized with a weak acid is employed, said solution having the same percentage of cellulose.

As explained above one important step of this process is to use a viscose having a percentage of caustic alkali at least equal to the percentage of its cellulose constituent.

I use the term "cellulose" as a generic term to include the substance which is known by this name, and also for hydrocellulose.

What I claim as my invention and desire to secure by Letters Patent is:

1. The herein described process of treating textile fabrics and spun goods, which consists in applying to the fabric a viscose possessing a percentage of caustic alkali at least equal to the percentage of its cellulose constituent, and subsequently rendering the viscose insoluble.

2. The herein described process of treating textile fabrics and spun goods, which consists in applying to the fabric a viscose possessing a percentage of caustic alkali at least equal to the percentage of its cellulose constituent, and subsequently decomposing the viscose into cellulose, respectively hydrocellulose.

In testimony whereof I have affixed my signature in presence of two witnesses.

LEON LILIENFELD.

Witnesses:
FRANZ REITER,
AUGUST FUGGER.