

UNITED STATES PATENT OFFICE.

HOWARD W. FLAGG AND GEORGE JACKSON, OF YONKERS, NEW YORK.

IMPROVEMENT IN FELTING PROCESSES.

Specification forming part of Letters Patent No. **202,805**, dated April 23, 1878; application filed March 22, 1878.

To all whom it may concern:

Be it known that we, HOWARD W. FLAGG and GEORGE JACKSON, both of Yonkers, in the county of Westchester and State of New York, have invented an Improvement in Felting Processes, of which the following is a specification:

This invention is more particularly designed for use in the process or operation of felting, as practiced in the manufacture of felt hats, but is also capable of application in the production of other felted goods or fabrics; and it relates to that method of felting in which, at the fulling or shrinking stage of the operation, oil of vitriol, or commercial sulphuric acid, is applied to the material in the fulling-mill. As hitherto carried into effect this oil-of-vitriol method has been subject to the drawback that the oil or greasy substance contained in the wool remained unaffected, and not only rendered the fulled material very difficult to clean in finishing the goods, but also, by clogging the pores, as they may be termed, of the fulled material, interfered very materially with the absorption and proper application of the "stiffening," so called, in the production of felt hats.

Our invention is designed to obviate this serious drawback to the manufacture of high-class goods; and consists in subjecting the material, during the fulling or shrinking part of the process, to the action of an alkali or alkaline substance added in the fulling-mill after the said material has been subjected to the action of the oil of vitriol. By this means, not only is the oil of vitriol, after having performed its function, wholly neutralized, but the oil and greasy substance contained in the wool is saponified and rendered soluble, and consequently, with other impurities intermingled therewith, capable of being readily removed by the subsequent washing to which the material is subjected.

There is, moreover, the further advantage incident to the use of our improvement that by means of it wool of inferior quality, or waste or shoddy, used in large proportions, give a product of a quality and value equal to those hitherto obtained only by the employment of wool of a comparatively high grade, and this, manifestly, at a greatly-diminished cost.

In the practice of our invention the various

mechanical operations of felting, including the shrinking in the fulling-mill, are carried on in the usual or in any suitable manner, and the oil of vitriol is applied to the material in the fulling-mill in the manner well known in the trade. When the oil of vitriol has substantially served its purpose in the fulling-mill, there is poured into the latter an aqueous solution of caustic potash, or of sal-soda, or other alkali or alkaline substance, the strength and quantity of such alkali being proportioned, as near as may be, in the ratio of their chemical equivalents, to the quantity of oil of vitriol employed, together with a surplus sufficient to saponify the oil or greasy substances contained in the wool. The fulling or shrinking operation is then continued until completed, the alkali or alkaline substance being thoroughly incorporated into the material undergoing the felting operation, and thus neutralizing the oil of vitriol and saponifying the oil or greasy substances, to secure the results hereinbefore set forth.

We have to say, furthermore, that our improvement economizes so greatly in the length of time required in the fulling or shrinking operation that it virtually doubles the working capacity of the fulling-mill; that our improvement also obviates in practice the adhesion of contiguous surfaces of the felt, so that in the fabrication of felt hats the entire "opening" operation is dispensed with, and that the amount of soap required in the final washing or cleansing of the goods after they are taken from the fulling-mill is, by our said improvement, reduced about seventy-five per cent.; and in such final washing or cleansing a much cheaper or inferior soap may be used than has hitherto been practicable.

What we claim as our invention is—

The herein-described improvement in the art of felting, the same consisting in subjecting the material to the action in the fulling-mill of an alkali or alkaline substance subsequent to the treatment of said material with oil of vitriol, substantially as herein set forth, for the purpose specified.

HOWARD W. FLAGG.
GEO. JACKSON.

Witnesses:

H. WELLS, Jr.,
HENRY EICHLING.