UNITED STATES PATENT OFFICE.

ETHELBERT BELKNAP, OF YONKERS, NEW YORK.

MANUFACTURE OF WOOL-FELT FABRICS.

SPECIFICATION forming part of Letters Patent No. 223,633, dated January 20, 1880.

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To all whom it may concern:

Be it known that I, ETHELBERT BELKNAP, of Yonkers, in the county of Westchester and State of New York, have invented a certain new and useful Improvement in the Manufacture of Wool-Felt Fabrics; and I do hereby declare that the following specification is a clear, true, and complete description of my invention.

My said improvement does not relate to the mechanical means employed in felting wool, but to certain intermediate cleansing operations, by which the felting and stiffening processes are accelerated and better results attained in the finished fabric.

My improvement is particularly applicable to the manufacture of wool-felt hats, but is of corresponding value in the manufacture of other classes of wool-felted goods.

It is well known that preliminary to felting the wool is carded and laid in bat form for building up the rudimentary hat-body or other article, and that this working of the wool necessarily involves the presence of more or less oily or greasy matter in the wool for properly controlling and working the fiber. This greasy matter in the wool also performs a valuable service in the rudimentary hat-body, for it therein contributes to the strength of the bat in assisting the fibers to maintain close relations to each other, and it renders it safe and easy to handle the bat during the first stages of the felting operations. Just as soon, however, as preliminary felting has secured a requisite degree of strength, the greasy matter ceases to perform any useful service and becomes an actual detriment, as it is well known that in proportion as the wool is free from oil so will the hot water and steam in the felting-mill have a more intimate contact with the fiber. To facilitate the felting operation, regardless of the presence of oily or greasy matter, fulling-soap has heretofore been used; but the nature of the goods is such that it is difficult afterward to so thoroughly remove the soap as to leave the fabric clear and bright, and if not thus removed it is approximately as fatal to a fine finish as the grease would be.

My invention consists in subjecting the fabrics, after they have been partially or fully felted, to a bath of benzine or other volatile solvent which is capable of removing from the fabric the oily or greasy matter contained therein.

I am well aware of the extensive use for many years of benzine, naphtha, and other hydrocarbons, as well as other sufficiently inexpensive volatile bodies, for removing grease and oils from the hulls of seeds, cotton-waste, and wool, and it is to be distinctly understood that I make no claim thereto, except when their use constitutes a step in the manufacture of wool-felt fabrics.

The prime benefits of my invention are attained by subjecting the fabrics to the benzine-bath just so soon as by partial felting they are strong enough to safely undergo the requisite handling, because the balance of the felting operation may thereafter be performed with greater facility and rapidity and with better results, and will require only hot water or steam in the felting-mill.

A substantial benefit is also attained, by reason of my invention, even if the fabrics are not subjected to the benzine-bath until next after the felting operation is completed, because the felting will then have been performed at least equally as well as heretofore, with or without soap, as the case may be, and the fabric will be thoroughly cleansed by the benzine from all foreign matters which might thereafter appear upon the surface of a finished hat, for instance, and destroy its neat and attractive appearance.

The operation succeeding the felting, particularly in the manufacture of hats, is the stiffening operation, during which shellac or other suitable "stiff," in some of its various forms, is applied. It is obvious that the presence of grease, oil, or even soap in the felt will prevent the uniform application of the stiff, and in this connection my invention has great practical value, for after the benzine-bath the felted goods readily and evenly take up the stiff, and good results are always attained.

The value of the increased labor incident to the handling of the goods in connection with the benzine-bath is more than compensated by the increased rapidity of the felting operation when the bath is employed with the partially-felted fabric, and by the increased facility with which the stiffening is effected, not

only in the case last mentioned, but also when the fully-felted fabrics are subjected to the bath. The exposure of the fabrics to the benzine will, of course, be varied as regards time, according to circumstances, and, with a view to economy, any apparatus may be employed with which the recovery of the volatile vapors may be accomplished. There are numerous kinds of apparatus heretofore employed in cleaning waste and wool with benzine which may be successfully used in this connection, and especially that class of apparatus with which the recovery of the greasy or oily matter is possible, because the value of the matter thus saved will serve to offset, to some extent, the increased cost of procedure in accordance with my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The improvement in the manufacture of wool-felt fabrics, which consists in subjecting said fabrics, after they have been partially or fully felted, to a bath of benzine or other cleansing volatile solvent, substantially as and for the purposes specified.

ETHELBERT BELKNAP.

Witnesses:
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