

# UNITED STATES PATENT OFFICE.

EMILE MAERTENS, OF PROVIDENCE, RHODE ISLAND.

## PROCESS OF CLEANING WOOL WITH VOLATILE SOLVENTS.

SPECIFICATION forming part of Letters Patent No. 698,211, dated April 22, 1902.

Application filed October 28, 1901. Serial No. 80,222. (No specimens.)

*To all whom it may concern:*

Be it known that I, EMILE MAERTENS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in the Art of Cleaning Wool with Volatile Solvents, of which the following is a specification.

This invention relates more specifically to the treatment of wool and other animal fibers prior to degreasing the same in the wet state with volatile fat-solvents (immiscible with water) and also to the removal of the residual solvent left on the fiber after its extraction and while the latter is in a wet state.

The operation is carried on in apparatus such as described in United States Patents Nos. 630,293, 630,294, 630,295, 630,296, 660,757, and 660,758.

I find that even wet wool which contains grease, whether the natural soaps are present or not, can be completely extracted with a suitable solvent of fat without requiring preliminary drying, and the residual solvent removed with heat and *vacuo* by any of the methods used in my previous patented processes; yet ordinarily the fat solutions so obtained are turbid and emulsified and require some and sometimes troublesome and expensive treatment to produce a good quality of grease. To obviate this difficulty with the grease and render the wool more easily freed from the solvent, I have found that by thoroughly rinsing the wool with water before degreasing to remove all the soaps and potash salts present a suitable solvent, such as naphtha, may then be applied and the resulting grease solution be greatly improved. It is difficult, however, to remove the last traces of the natural soap and potash without the use of much water, and unless this is done the turbidity and emulsifying effect in some degree will be produced. If, however, the wool, whether wet or dry, is first impregnated with a salt, a suitable acid, or suitable acid salt in solution, all emulsifying of the solvent with the water and natural soaps present is prevented, and the solvent solution may follow right on top of the saline, acid, or acid saline solution, merely displacing that solution by the solvent, thus doing away with either draining or squeezing, and the solvent

solution of fat will run off quite clear and bright in color. Moreover, the residual solvent can then be removed from the wool fiber with greater ease and with less danger of forming pockets in the mass, and the wool comes from the receiver in a more lofty and better condition than when treated in the wet state without the saline solution. It is obvious, however, that this method alone gives no opportunity to recover the potash salts present in the wool. I prefer, therefore, to first remove the bulk of the potash salts by one or two baths of water, which may be drained or squeezed out at convenience. The saline or acid-saline solution may then be applied to impregnate the wool and the object of the invention obtained upon the principles already described. It is obvious also that the liquor containing the potash salts and soap can be used again and again until sufficiently concentrated for economical evaporation and also that the saline solution may be used again and again until too much contaminated with other extraneous matters.

After the degreasing operation is completed and when the bulk of the solvent has been removed from the fiber in any suitable manner (such as being drained and pressed, drained, pressed, and blown out or displaced by water or suitable aqueous solutions) the adhering residual solvent is easily removed from the fiber by heat, steam, aqueous vapors, solvent vapors, air, or gas, or by a combination of two or more of these agents and preferably in conjunction with a partial vacuum, their effect being much more rapid and thorough than when water alone (without having the proper salt, acid, or acid salt in solution) is present on the fiber with the solvent. Therefore when in an extracting process the bulk of the residual solvent present on the fiber is sought to be removed by water or alkaline solutions a treatment with a saline, acid, or acid-saline solution should, preferably, follow them, and the wool should, preferably, be freed from the remaining adhering solvent while impregnated with such a solution.

I find that chlorid of sodium, sulfate of sodium, bisulfate of sodium, sulfuric acid, oxalic acid, &c., or a mixture of two or more of these in solutions from  $\frac{1}{2}^{\circ}$  to  $25^{\circ}$  Baumé (ac-



according to the composition of the solutions used) are suitable to my purpose; but I do not wish to limit myself to their use only, as any salt, acid, or acid salt which will not act deleteriously and will produce like results is available for the purpose.

Having described my invention, what I claim is—

1. In the art of cleaning wool with volatile fat-solvents the process which consists in first removing the bulk of the potash compounds from the wool, then impregnating the wool with the solution of an agent which will prevent emulsification of the water, potash compounds present and the volatile solvent subsequently introduced and then extracting the fat from the wool by means of a volatile fat-solvent.

2. In the art of cleaning wool with volatile fat-solvents the process which consists in first impregnating the wool with the solution of an agent which will prevent emulsification of the water, potash compounds present and the volatile solvent subsequently introduced and then extracting the fat from the wool by means of a volatile fat-solvent.

3. In the art of cleaning wool with volatile fat-solvents the process which consists in first impregnating the wool with the solution of an agent which will prevent emulsification of the water, potash compounds present and the volatile solvent subsequently introduced, then extracting the fat from the wool by means of a volatile fat-solvent and then removing the volatile solvent from the wool.

4. In the art of cleaning wool with volatile fat-solvents the process which consists in first impregnating the wool with the solution of an agent which will prevent emulsification of the water, potash compounds present and the volatile solvent subsequently introduced, then extracting the fat from the wool by means of a volatile fat-solvent, then removing the bulk of the solvent from the wool and then eliminating the residual solvent.

5. In the art of cleaning wool with volatile fat-solvents the process which consists in extracting the grease with a volatile fat-solvent

and then removing the residual solvent from the wool, both steps being performed in the presence of an agent which will prevent emulsification.

6. In the art of cleaning wool with volatile fat-solvents the process which consists in extracting the grease with a volatile fat-solvent in the presence of an agent which will prevent emulsification and then removing the residual solvent from the wool.

7. In the art of cleaning wool with volatile fat-solvents the process which consists in removing the residual solvent from the wool in the presence of a suitable acid, salt or acid salt which will prevent the solvent from clinging to the fiber and water present.

8. In the art of cleaning wool with volatile fat-solvents the process which consists in removing the residual solvent from the wool in the presence of a suitable agent or agents whereby the solvent is prevented from clinging to the fiber and water present.

9. In the art of cleaning wool with volatile fat-solvents the process which consists in first depotashing the wool and then displacing the depotashing agent with a volatile fat-solvent immiscible with the depotashing agent.

10. In the art of cleaning wool with volatile fat-solvents, the process which consists in first depotashing the wool, then displacing the depotashing agent with a volatile fat-solvent immiscible with the depotashing agent and then removing the volatile solvent from the wool.

11. In the art of cleaning wool with volatile fat-solvents, the process which consists in first depotashing the wool, then displacing the depotashing agent with a volatile fat-solvent immiscible with the depotashing agent, then removing the bulk of the solvent from the wool and then eliminating the residual solvent.

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

EMILE MAERTENS.

Witnesses:

MABEL I. FAY,

JOHN S. MURDOCK.