

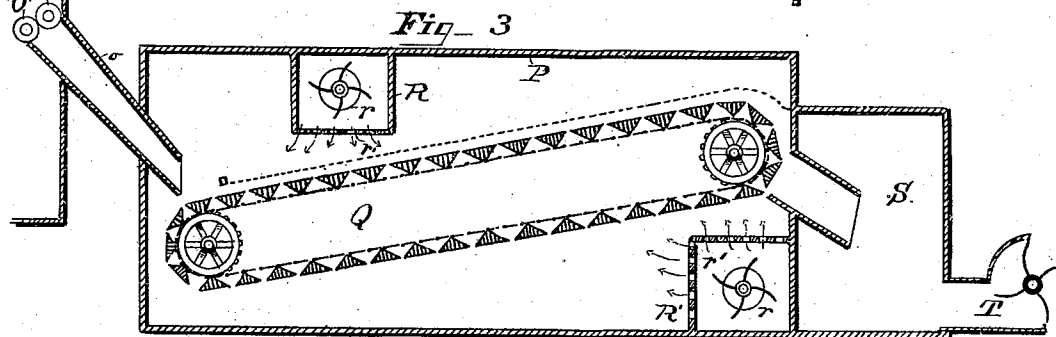
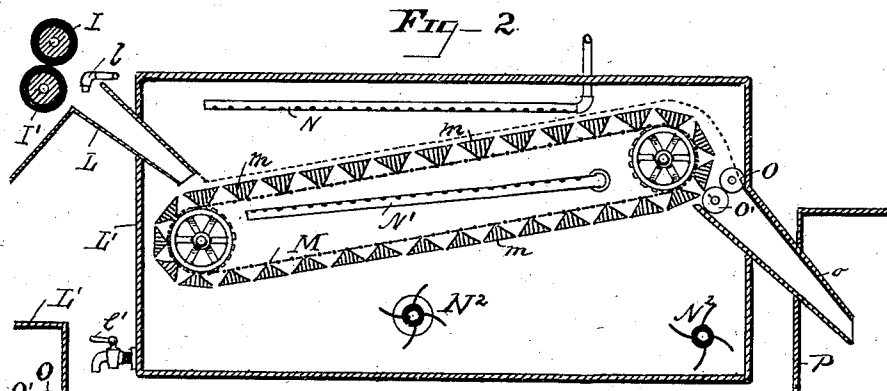
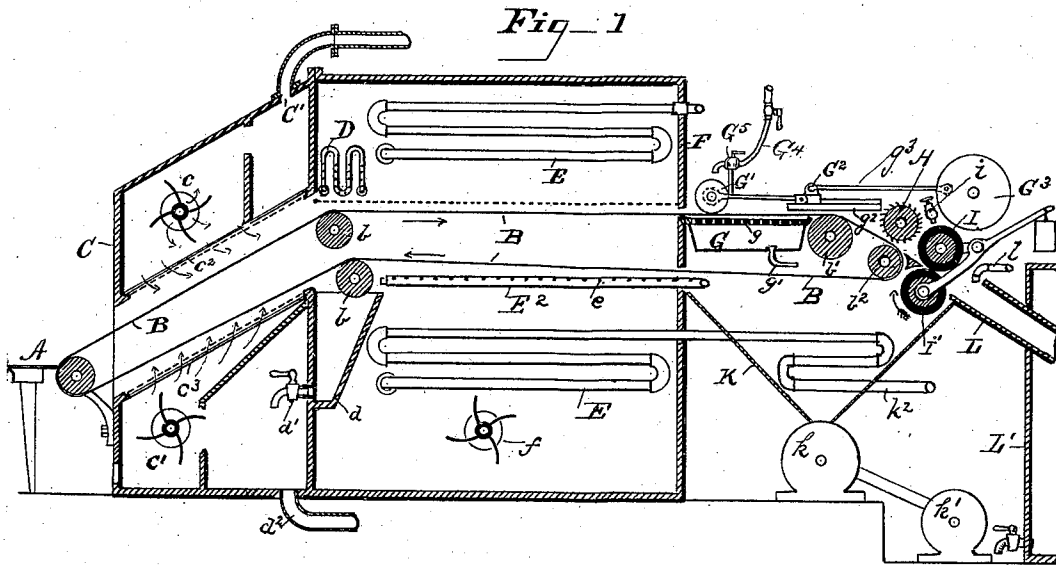
(No Model.)

C. ROBESON.

PROCESS OF AND APPARATUS FOR CLEANING AND SCOURING WOOL.

No. 372,987.

Patented Nov. 8, 1887.



WITNESSES:

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PROCESS OF AND APPARATUS FOR CLEANING AND SCOURING WOOL.

SPECIFICATION forming part of Letters Patent No. 372,987, dated November 8, 1887.

Application filed August 5, 1886. Serial No. 210,135. (No model.)

To all whom it may concern:

Be it known that I, CHARITY ROBESON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Processes of and Apparatus for Cleaning or Scouring Wool; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figures 1, 2, and 3 are vertical longitudinal sections of the apparatus, Fig. 1 showing the scouring part, Fig. 2 the rinsing part, and Fig. 3 the drying part, of said apparatus.

My invention has for its object to provide an improved process or method of cleansing or scouring wool, whereby the use of alkaline or other chemical substances or compositions is dispensed with and the grease, wax, or sebaceous matter removed in such manner that it can readily be recovered, the fiber treated being in such condition that it may be carded and spun without requiring to be oiled.

A further object of my invention is to provide an apparatus whereby my process may be practiced or carried into effect.

Heretofore wool has generally been scoured by means of water and strong alkaline soaps, various forms of appliances being used in practicing the scouring operation. It has also been proposed to scour wool by a process involving the employment of the vapor of naphtha. The principal objection to the water and soap scouring process is that the alkali injures the fiber of the wool and leaves it in a harsh condition, which requires the addition of oil to render the wool fit for carding and spinning. Aside from other objections, the inflammable character of naphtha renders its use for scouring purposes undesirable. By my invention the removal of the foreign substances from the wool is effected by the agencies of aqueous moisture, heat, and pressure; and my invention accordingly consists, first, in the process and, second, in the apparatus, whereby such agents are made instrumental for the accomplishment of the object in view. I have discovered that if a dirty fleece (or fleece in the condition which is usual preliminary to the

scouring operation practiced after its removal from the animal) is sufficiently moistened and then subjected to a temperature of or about 135° Fahrenheit, the grease, wax, or sebaceous humors (sometimes called "yolk") therein will be softened or "started," so that by the application of pressure such foreign matter may be readily and wholly, or almost wholly, expelled from the fiber. Accordingly, in carrying my invention into effect I first moisten the fleece, and then, while in a moistened or damp condition, I subject it to the action of heat at a temperature of about 135° Fahrenheit (variable as hereinafter specified) and then subject it to a squeezing action, whereby the suggested foreign and other matters are removed. The wool thus treated is subsequently rinsed in water and squeezed and dried, and then it is in condition to be carded and spun without requiring to be oiled, as has heretofore been necessary, as by regulating the pressure of the squeezing sufficient oil may be left in the wool to dispense with the usual oiling.

I will now describe a construction of apparatus whereby my process may be practiced, but wish it to be distinctly understood that my invention is not limited to such apparatus, as my process may be practiced with appliances of a simpler and different construction.

In the accompanying drawings, A represents a table on which the dirty or unscoured fleeces are laid, and from which they are fed to a traveling endless apron or band, B. Said apron travels in a casing or trunk, C, containing two blowers or fans, *c c'*, one above and one below the band, the purposes of which are to direct or throw air-currents on the wool to loosen the fiber and remove dust, &c., therefrom. Said fans are protected by screens *c" c"*, which cause the air-currents to be diffused and prevent loose fiber from entering the fan-chambers.

C' represents a duct through which suction may be exerted to draw off dust from the upper compartment of the overhead fan-chamber.

D is a pipe from which water is discharged in streams, jets, or spray on the wool as it is carried beneath in its passage over the apron-sustaining rollers *b b*, and *d* is a tank for catching the water, from which it is led by a faucet, *d'*, and carried off, along with the collected

dirt in the lower fan-chamber, through an outlet-pipe, d^2 . The amount of moistening applied by the pipe D will depend upon the quality and condition of the wool, and must be governed by the judgment of the operator. Very dirty wool may require to be moistened to, or almost to, the point of saturation, while less dirty wools will require less water and may be moistened to the condition of dampness, or be sprinkled.

E and E' are steam or hot-air pipes located, respectively, above and below the apron B, and in a substantially-closed chamber, F, in which the temperature can be raised to and maintained at the required degree, said pipes or their feeder being supplied with suitable cocks or other appliances for regulating the temperature. Such temperature should be about 135° Fahrenheit, subject to variation, according to the quality and condition of the wool under treatment. Some wools will not require a temperature of more than 110°, and others may require or will safely endure a temperature of 140°. The exact temperature for such case should be determined according to the skill and judgment of the operator; but the temperature must or should in all cases be sufficient to soften the sebaceous matter in the moistened wool. The length of time during which the wool should remain in the heating-chamber is also dependent upon the character and condition of the wool and should be controlled by the operator. I suggest a period of from five to seven minutes as sufficient for general purposes, though this may be increased or lessened according to circumstances.

E² is a steam-pipe located in the heating-chamber F, and having holes e , through which jets of steam or hot air are emitted, serving to aid in heating the chamber, loosening the wool, or separating its fibers, and causing the moisture to penetrate it in its passage through said chamber. If steam-jets be used, the moisture will be increased and the steam act on the wool.

In the chamber F is a fan or blower, f , which serves to agitate the air, &c., therein. The apron B, on emerging from the chamber F, passes over a tank, G, having a grating-top, g , through which is ejected warm water supplied by a pipe, g' , such water flowing against said apron, and the wool laid thereon tends to loosen the latter.

Above the grating g , and supported thereby, is an internally-heated roller, G', connected with a slide, G², supported on ways or guides g^2 , and connected, by a rod or piston, g^3 , with a crank or eccentric, G³, whereby said roller is caused to reciprocate or travel back and forth over the wool on apron B, serving to straighten the fiber and to prevent matting or felting of the latter. A rubber or flexible hose, G⁴, connected with a suitable source of supply and having a discharge-cock, G⁵, which travels with the roller G', discharges a stream of hot water on said roller, which flows down over the latter, keeping its surface

cleaned and serving to moisten the wool and retain the heat in the latter. The apron B passes over a roller, b' , and thence descends or forms an incline to another roller, b^2 , above which is located a toothed cylinder or picker-roll, H, the purpose of which is to loosen the fiber and aid its presentation or delivery to the squeeze-rollers I I'. These rollers are hung so that they may be weighted to regulate their pressure, and both are wound or enveloped with a covering of worsted yarn, such covering being indicated by the heavy black circles of said rolls.

Above the upper roller is a cock, i , for discharging warm water on the upper roll and washing down the moisture, grease, &c., expressed from or squeezed out of the wool by the rollers I I', such water, &c., passing down through a hopper or conduit, K, to an apparatus indicated at $k k'$, whereby the water is separated from the oil, &c., the latter being recovered and used for industrial or medicinal purposes. Said hopper is kept heated by a pipe, k^2 , or other appliance imparting heat to the wool above, so as to prevent chilling or hardening of the wax, &c., after leaving the heating-chamber F and on its way to the squeezing-rolls. The wool on leaving the squeeze-rolls is substantially or almost wholly freed of grease, wax, or the sebaceous matter, and now only requires to be rinsed in water and dried to make it ready for carding or combing and spinning.

Any suitable form of rinsing and drying apparatus may be employed, and I will now describe a construction I deem best adapted for the purpose.

L represents a chute or conduit leading downwardly from the squeeze-rolls to a tank, L', a cock, l , which discharges lukewarm or tepid water, being arranged at the head of said conduit or chute to facilitate the downward movement of the wool therein. Within the tank L' is an endless apron or conveyer, M, carrying a series or number of baskets or open receptacles, $m m$, which receive the wool as it is discharged from the conduit L, the object of separate receptacles being to keep the wool apart and to permit free access of the running water to every part thereof.

N and N' are pipes having small openings, through which water (which may be cold) escapes into the tank L. One of these pipes is located above the apron and discharges downwardly. The other is between the folds or plies of the conveyer M and discharges upwardly.

N² N² are wheels in the tank L' for producing agitation of the water therein, and l' is a cock for drawing off the dirty water from said tank. The water in the tank L' should be maintained at such a level that the baskets on the under side of conveyer M will be submerged therein. The baskets m , as they turn over at the upper or discharge end of the conveyer, dump their contents into the bite of two squeeze-rolls, O O', wound with worsted

yarn, by which the water is squeezed out, the fiber passing downwardly through a chute, *o*, to the drying-compartment *P*. Said compartment has a conveyer, *Q*, substantially similar to conveyer *M*, and two air-ducts, *R R'*, with fans or blowers *r r*, which blow the air in small currents or distributively through the wool on said conveyer. These air-ducts should have appliances, not necessary to be detailed, for regulating, controlling, and directing the currents of air discharged through the foraminated walls *r' r'* of the air-ducts or distributors *R R'*. *S* is a conduit or trunk through which the dried wool is discharged, being drawn off by the aid of a suction fan or wheel, *T*.

What I claim as my invention is as follows:

1. The herein-described method for scouring wool, the same consisting in, first, moistening the wool with water; secondly, subjecting the moistened wool to sufficient heat to soften or start the grease and wax or sebaceous humors, and, thirdly, applying pressure to remove the moisture and humors, substantially as set forth.

2. The method herein described for removing grease and wax or sebaceous humors from wool, the same consisting in, first, moistening the wool with water, then subjecting the moistened wool to a temperature between 100° and 150° Fahrenheit until such grease and wax or sebaceous humors become softened, and then expelling the latter by pressure, substantially in the manner herein set forth.

3. The method herein described for scouring wool, the same consisting in the following steps: first, moistening the wool by spraying water upon it; secondly, subjecting it to sufficient heat to soften or start the grease and wax or sebaceous humors; thirdly, applying pressure to remove the moisture and humors, and, fourthly, rinsing the fiber, substantially as herein set forth.

4. In an apparatus for cleaning wool, the combination of a heating-chamber, a conveyer, a water-pipe, and a steam or hot-air pipe, whereby wool carried through said cham-

ber is first moistened by water and then heated and subjected to the action of steam or hot air, substantially as shown and described.

5. In an apparatus for cleaning wool, the combination, with a conveyer, of an air-chamber having means, as a fan or blowers, for blowing air, a heating-chamber, a water-discharge, and squeeze-rolls for expelling the humors, substantially as shown and described.

6. In an apparatus for cleaning wool, the combination, with a conveyer, *B*, and a tank, *G*, having a top, *g*, of a reciprocating rollersupported by said tank and moving over said conveyer, substantially as shown and described.

7. In an apparatus for cleaning wool, the combination of squeeze-rolls, a chute or conduit leading therefrom, and a water-discharge for facilitating the movement of the wool through said chute or conduit, substantially as shown and described.

8. In an apparatus for cleaning wool, the combination, with a conveyer or traveling band, of squeeze-rolls and a hopper or receptacle for receiving the water, &c., expelled by the squeeze-rolls, said hopper having means for keeping it heated, substantially as set forth.

9. In an apparatus for cleaning wool, the combination, with a traveler or conveyer, *B*, of a heated roller, *G'*, reciprocating or traveling over the conveyer for straightening the fiber and maintaining heat in the wool, substantially as shown and described.

10. In an apparatus for cleaning wool, the combination, with a reciprocating roller, *G'*, of a flexible connection, *G⁴*, and a discharge for throwing hot water on said roll, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of August, 1886.

CHARITY ROBESON.

Witnesses:

WILL H. POWELL,
R. DALE SPARHAWK.