

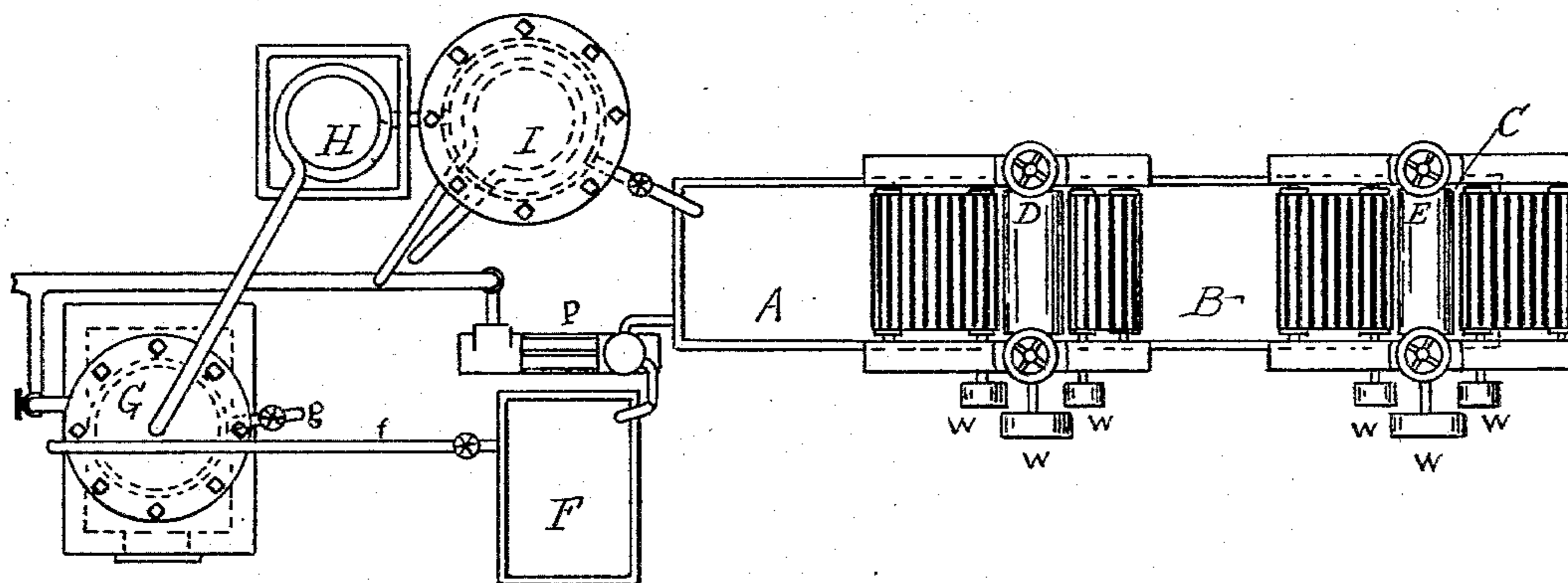
(No Model.)

P. C. McILHINEY.  
PROCESS OF EXTRACTING FAT FROM WOOL.

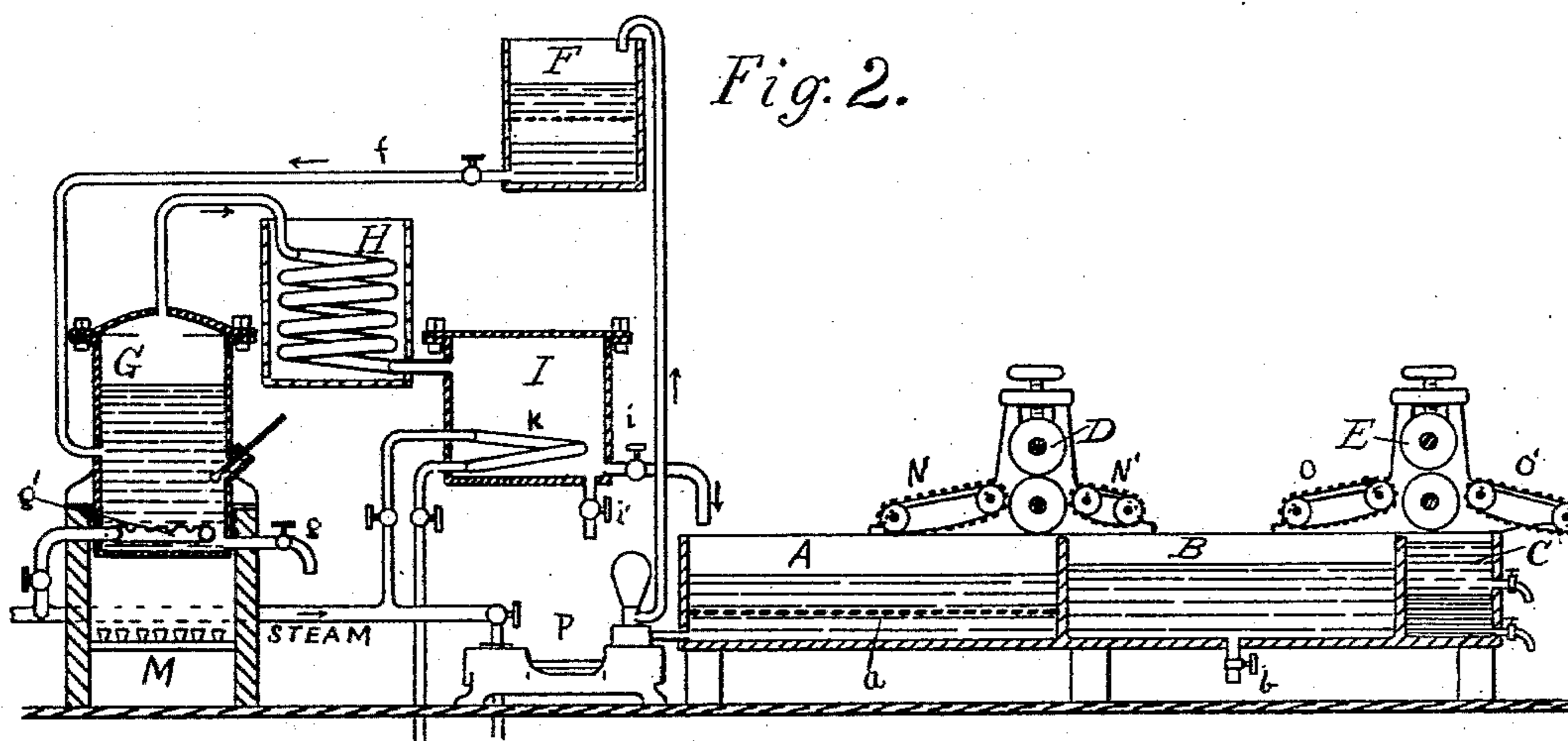
No. 551,396.

Patented Dec. 17, 1895.

*Fig. 1.*



*Fig. 2.*



Witnesses:

G. S. Ely  
J. W. Stokes.

Inventor,

Parker C. McIlhiney.

# UNITED STATES PATENT OFFICE.

PARKER C. MCILHINEY, OF JERSEY CITY, NEW JERSEY.

## PROCESS OF EXTRACTING FAT FROM WOOL.

SPECIFICATION forming part of Letters Patent No. 551,396, dated December 17, 1895.

Application filed August 10, 1894. Renewed April 23, 1895. Serial No. 546,925. (No specimens.)

*To all whom it may concern:*

Be it known that I, PARKER C. MCILHINEY, a citizen of the United States of America, residing at Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Processes of Cleansing and Removing Fat or Grease from Wool, of which the following is a specification.

Heretofore wool has been cleansed by washing it in aqueous solutions of soap or of alkalis, by the use of volatile solvents, as benzine, benzol, toluol, naphtha, carbon disulphide, carbon tetrachloride, &c., the solvent being afterward separated from the fat or grease by distillation, or by the use of non-volatile solvents, as paraffine-oil, the fat or grease being afterward partially separated from the solvent by cooling and subsidence.

The use of volatile solvents—i. e., solvents boiling below 150° centigrade—is attended with much inconvenience on account of the difficulty of preventing loss of solvent by evaporation, and with most solvents the great danger of fire. The operation must therefore be conducted in closed vessels, which is inconvenient.

In the case of non-volatile solvents, as paraffine-oil, it is extremely difficult to remove from the wool the last traces of solvent, and moreover the solvent cannot be economically recovered from its mixture with the grease or fat. The grease or fat obtained by this process is not pure, being contaminated with solvent.

My improvement consists in using as a solvent for washing the wool a liquid whose boiling-point is sufficiently high to allow of its being used with safety in open vessels, and afterward recovering the solvent and separating it from the fat which it holds in solution by subjecting the liquid to distillation with the aid of free steam.

The solvent volatilizes with the steam and the two are condensed together in a condenser. The water separates from the solvent by gravity, and the recovered solvent is used on a fresh portion of wool. By the use of steam in this way to assist in the distillation I accomplish a complete separation of the solvent from the fat or grease, at the same

time avoiding all injury to the fat or grease by overheating.

The solvent which I use in carrying out my process may be made from petroleum, beech-tar, coal-tar, pine-tar, rosin-oil, shale-oil, or any source of similar liquids.

I find in practice that an oil which boils substantially between 170° and 250° centigrade has a flash-point so high that it may with safety and economy be used for washing wool in open vessels, and may be separated from the grease which it may hold in solution by distillation with free steam at a temperature low enough not to injure the grease.

I find that if the wool is washed with a solvent maintained at too high a temperature it is injured thereby, and I do not in carrying out my process consider it advisable to use a temperature much higher than 50° centigrade.

While the wool is being washed in the solvent it should be slightly agitated to allow the dirt and potash salts which are insoluble in the solvent to separate from the wool and fall to the bottom of the vessel, which should be provided with a perforated false bottom. I find that this agitation is best accomplished by using for washing the wool with solvent an apparatus similar to the ones at present in use for washing wool with aqueous solution of soap and alkalis, in which the wool is moved gently through the liquid by rakes and fingers.

The insoluble material found beneath the false bottom of the washing apparatus, and also that obtained by filtering or settling the mixture of fat or grease with solvent, contains most of the potash originally contained in the wool. After removing the solvent from it by pressing, distillation, or in any suitable manner it is incinerated to destroy organic matter and lixiviated with water to extract the potash. The potash is then recovered from the water solution by evaporation.

After the wool has been washed in the solvent it is washed with water and squeezed between rollers, pressed, rotated in a centrifugal machine with perforated sides, or pressed in any suitable way to remove as far as possible the solvent remaining in the wool.

prefer to accomplish this result by pressing the wool between hollow rolls which have perforated surfaces to facilitate the removal of the liquid from the wool and to pass the wool several times into water and between pairs of such rolls, as I find that in subjecting wool which contains solvent and water several times to the action of such pressure the solvent is almost entirely removed in an emulsified state. The water used for this washing is after use allowed to run into a settling-tank where the emulsified solvent separates from the water and is returned to the washing apparatus. After this washing the wool is quite clean except for the presence of a very small quantity of solvent which evaporates in the course of a few hours.

If it is desired the wool may be given a final rinsing in a weak soap bath to improve its appearance.

In the accompanying drawings, Figure 1 is a plan of a form of apparatus adapted to carry out my process, and Fig. 2 is a sectional elevation of the same.

There is a tank A which is provided with a perforated false bottom *a*. Into this tank solvent is allowed to run after being heated to the proper temperature either in the receiver I or in any other suitable vessel. The wool is then thrown into this tank and allowed to soak for a time, when the grease is dissolved by the solvent, and the dirt and potash salts which the grease fastened to the fiber being now liberated fall to the bottom of the vessel beneath the false bottom, which prevents the wool from again coming in contact with the dirt. While the wool is soaking in the solvent it is gently agitated, and after it has been sufficiently treated is thrown onto an apron N, which carries it to a pair of squeeze-rolls D. The pressure on these rolls may be regulated by any suitable arrangement. The rolls press most of the solvent out of the wool and another apron N' throws it into a tank B, which is similar to A but which need not be provided with a false bottom. This tank B contains warm water. The wool is gently agitated in this water for a short time to remove any dirt which the solvent in tank A had failed to remove and is then thrown onto the apron O leading to the rolls E. These rolls squeeze out from the wool an emulsion of solvent and water, which falls into the tank C, and the wool is carried off in a clean state by another apron O'. Motion is imparted to the two rolls and to the movable aprons by the drums W. The wool may still contain traces of solvent, but this evaporates in a short time, the drying being hastened, if necessary, by heat, or by placing the wool in a closed vessel and exhausting the air therefrom, or in any other suitable manner. The emulsion of solvent and water separates by gravity into its two constituents and the two are drawn off separately by suit-

able cocks, (shown in the drawings,) the solvent so obtained being returned to tank A.

When the solvent in tank A contains sufficient grease, the pump P conveys it to the filter F. This is a tank which contains a screen covered with cloth to act as a filter. The solvent containing the grease in solution is in this way separated from the dirt and potash salts which collect above the screen and are removed at suitable intervals.

From the filter F the filtered liquid is conveyed by the pipe *f*, provided with a stop-cock, to the still G, which is provided with a thermometer and a perforated steam-coil *g'*, as shown in the drawings, and is also heated by the fire M. In this still the liquid is heated to a temperature of about 200° centigrade and steam admitted to the perforated coil *g'*. The heat and free steam volatilize the solvent which, together with the steam, passes over into the condenser H. In this condenser the vapors are cooled and thereby liquefied and flow into the receiver I, where the water and solvent separate by gravity and the water is drawn off by the cock *i'*, shown in the bottom of the receiver. The receiver I is provided with a close steam-coil *k*, which is intended to heat the solvent to the proper temperature before allowing it to run by the pipe *i*, shown in the side of the receiver, into the tank A to be again used in cleaning fresh material. After all the solvent has been volatilized in the still G nothing remains but the fat or grease. The heating and admission of steam to the perforated coil are now suspended and the grease is drawn off by the cock *g*, shown in the lower part of the side of the still.

I do not confine myself to the use of this form of apparatus, but any other suitable apparatus may be used. For example, the wool while it is immersed in the solvent in the tank A may be agitated and carried to the apron by mechanical rakes such as are at present in use in the Sargent wool-washing machines. Again, the liquid drawn from tank A may be allowed to deposit the dirt and potash salts which it contains mechanically suspended by subsidence instead of being filtered, as in the apparatus shown in the drawings, or other modifications may be introduced without affecting the nature of the process.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The process of cleansing and extracting fat or grease from wool which consists in washing the wool with a solvent which boils substantially between 170° and 250° centigrade, the solvent being maintained at a temperature which will not injure the wool, and afterward recovering the solvent by distillation.

2. The process of cleansing and extracting fat or grease from wool which consists in washing the wool with a solvent which boils sub-

stantially between 170° and 250° centigrade, the solvent being maintained at a temperature which will not injure the wool, separating the wool from the solvent, heating the  
5 solvent containing the fat or grease in solution in a still provided with a condenser, passing steam through the liquid to assist in vola-

tilizing the solvent, and condensing the solvent for use in cleansing fresh material.

PARKER C. MCILHINEY.

Witnesses:

GEORGE G. TENNANT,  
ROBERT CAREY.