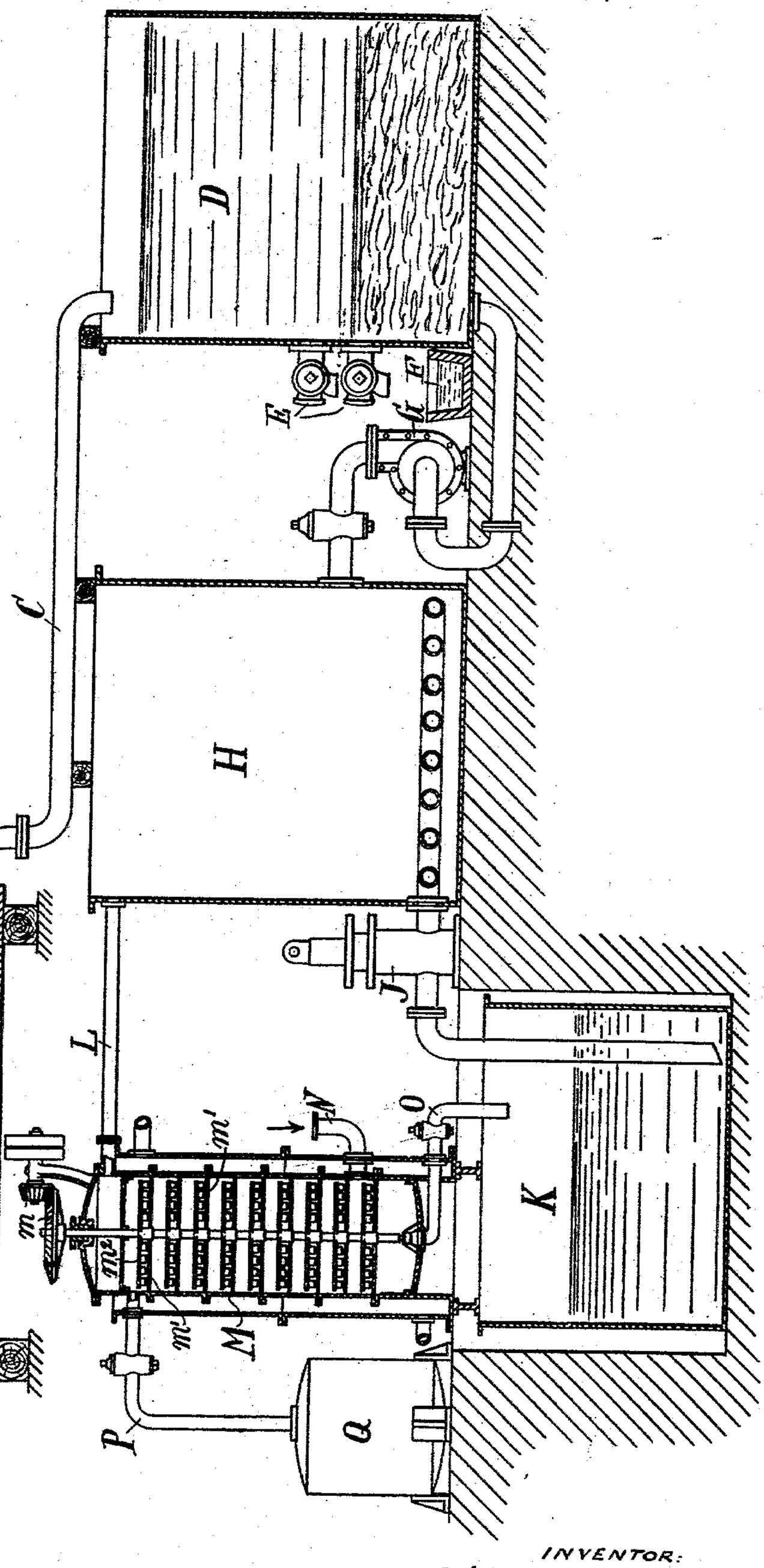
(No Model.)

J. C. LAHUSEN.

PRODUCTION OF NEUTRAL WOOL GREASE.

No. 511,051. Patented Dec. 19, 1893.



WITNESSES:

Fred White

C. K. Fraser.

INVENTOR:

Johann Carl Lahusen,

By his Attorneys:

Arthur C. Fraser & Co

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHANN CARL LAHUSEN, OF BREMEN, GERMANY.

PRODUCTION OF NEUTRAL WOOL-GREASE.

SPECIFICATION forming part of Letters Patent No. 511,051, dated December 19, 1893.

Application filed January 10, 1893. Serial No. 457,961. (No specimens.) Patented in Luxemburg September 28, 1892, No. 1,625, and in Italy September 30, 1892, XXVII, 32,717, LXIV, 213.

To all whom it may concern:

Be it known that I, JOHANN CARL LAHUSEN, a subject of the Emperor of Germany, residing in Bremen, Germany, have invented certain new and useful Improvements in or Relating to the Production of Neutral Wool-Grease from Suint or Wool-Washings, of which the following is a specification.

This invention has been patented in Luxemburg, No. 1,695, dated September 28, 1892, and in Italy, XXVII, 32,717, LXIV, 213, dated September 30, 1892.

The neutral wool grease found in commerce has hitherto only reached a melting point at above 45° centigrade, which not infrequently rose to 60° or even 65° centigrade. Such fats were at all ordinary temperatures much too solid to allow of their being rubbed down like ointment, and therefore the most varied additions, such as water, lard and oils, were necessary in order to render them sufficiently ductile; such additions, however, damaged the known valuable properties of pure unmixed wool grease.

By this invention, there is obtained directly from the suint separated out of the water from wool washing, a neutral wool grease, which has, in addition to other prominent advantages, an extremely low melting point, so that the grease at the ordinary temperature of a room has a thick oily or ointment-like consistency. The fixing of the melting point is also so far under control that it may stop at any degree between 25° and 36° centigrade. This result is attained by means of a washing process to which the suint is subjected. It has been found that the low melting wool grease is comparatively easily removed by washing, while the alkaline earth soaps remain behind, and these latter retain the less easily melted constituents of the wool grease which have also a higher specific gravity.

The accompanying drawing is a vertical sectional elevation of a well known form of apparatus by which my improved process can most conveniently be carried out.

Referring to the drawings, let A represent a feed-pipe for supplying water discharged from any wool washing machine, B a sediment trough receiving the water from A and having cross bars which arrest any sediment, as clay, sand or wool fibers contained in the water which may settle as the water flows slowly across the trough.

Let C represent a pipe conveying the water from the trough B to the treating apparatus, D the first vessel of the treating apparatus in which the water is mixed with an acid solution of chloride of calcium or with other chemicals to precipitate certain of its soluble salts, as well as the wool grease and soap it contains.

Let E represent faucets for removing the water after such precipitation, and F an escape gutter from which the water thus removed may run to waste.

Let G represent a centrifugal pump for withdrawing the precipitate from receptacle D and delivering it to the tank H, which latter is the washing tank having a coil in its bottom, fed with an upward flow of water by a pump J from a water tank K.

L is a pipe leading from the upper part of the tank H to the extractor M.

P is the pipe leading from the latter to the distilling apparatus Q.

Referring now to the drawings, I will describe my improved process when employed in connection with the apparatus therein shown.

The water coming from any wool washing machine through the pipe A is first freed from heavier substances being in suspension in the water, which substances have been carried along with the water and which consist usually of clay, sand and wool fibers. For this purpose the water employed in the washing machines is allowed to pass through a long sediment channel or trough B of suitable proportions (say three meters wide and ten meters long); the speed of the said water while traversing the trough will be diminished so as to allow the sedimentation of the substances suspended in the said water. After having passed through such channel the water is free from suspended matters, which latter are now on the bottom of the channel and may be removed therefrom in any usual manner. The water after leaving the trough B only contains the dissolved substances, (such as for instance carbonate of sodium or carbonate of potassium and soap added during the wash-

ing process in order to wash the wool) and it contains moreover in suspension wool grease divided in an extremely fine manner. This water, which is very dull or clouded and dark colored in appearance, is then conducted through a pipe C into a large receptacle D, and the dissolved matter in the water is here precipitated by means of an acid solution, preferably of calcium chloride This acid solution is obtained by mixing an aqueous solution, preferably of calcium chloride, with an acid (as muriatic acid). The proportions of the salt and of the acid must be exactly calculated; a chemical analysis of the washing water must therefore be performed for each receptacle D when more than one is used. By such analysis there is to be ascertained the proportions of the carbonates (such as carbonates of sodium or potassium), and of the soaps contained in the water to be treated. The above acid solution must contain such proportion of acid (as muriatic acid) as to exactly convert the carbonates in the water to be treated into the corresponding salts (as chlorides); also such proportions of the chloride (calcium chloride) must be contained in the acid solution that the soaps in the water to be treated may be converted into insoluble soaps (as limesoaps).

If for example, by analysis of the wool washing water in one receptacle D it is found that one hundred cubic meters of the water contain fifty kilograms carbonate of sodium, thirty kilograms carbonate of potassium and two hundred kilograms soap, the acid solution of calcium chloride to be added must contain an aqueous solution one hundred and fifty kilograms muriatic acid (containing thirty-three per cent. HCl) and thirty-six kilograms calcium chloride. These proportions correspond with, or may be calculated by means of, the following equations, explaining the reaction taking place by the addition of such solution:—

1. $\underbrace{Na_2CO_3}+2HCl=2NaCl+H_2O+CO_2$

Carbonate of sodium.

2. $\underbrace{K_2CO_3}+2HCl=2KCl+H_2O+CO_2$

Carbonate of potassium.

3. $\underbrace{2C_{17}H_{35}COONa}+CaCl_2=\begin{matrix}C_{17}H_{35}COO\\ C_{17}H_{35}COO\end{matrix}\!\!>Ca+2NaCl$

Soap.

The said analysis and calculation must be performed with the greatest exactitude for the following reasons:—By adding a too great proportion of acid a quantity of soap corresponding to such excess of acid will be decomposed and free sebacic acid will be present in the wool grease. By adding a too small proportion of acid a corresponding quantity of sodium or potassium carbonate will remain undecomposed; such carbonate forms with calcium chloride calcium carbonate, which precipitates very difficultly and is therefore very injurious to the following washing process. While very much depends on the proportion of the acid and of the chloride, it is immaterial whether an equivalent salt, such as magnesium chloride or sulphate of magnesium instead of calcium chloride—or sulphuric acid instead of muriatic acid—be employed, as this is only a matter of cost. This treatment in the vessel D precipitates the suint carried in the water together with certain of the other substances dissolved therein. After the suint and other precipitates have settled in the vessel D, the pure water above is drawn off through the faucets E, into the gutter F, from whence it runs to waste. Then the suint settled under the water in the vessel D is drawn by means of the pump G into the washing tank H, which latter has a feed-pipe at the bottom supplied by a pump J with water from a tank K. The water thus fed to tank H passes slowly up through the suint, stirring it slightly, and carries the light, low melting wool grease upward until the latter passes through the pipe L into the extracting apparatus M. This is the well known Hirzel extractor, consisting of a cylinder having internal partitions m', between which move stirrers m^2 driven by driving gear m. A pipe N supplies a stream of benzine to the lower part of the apparatus M, and as the benzine rises it dissolves all the wool grease in the water in the extractor. At top the benzine saturated with the wool grease it has dissolved leaves the extractor through pipe P, and passes to the distilling apparatus Q where by heat the benzine is driven off and the wool grease remains. The water in the bottom of the extractor M, from which water all the wool grease has been dissolved by the benzine, flows through the pipe O back again into the tank K, and is used over again in the washing tank H. The wool grease remaining in the distilling apparatus Q is the pure, low temperature melting grease desired, and it can be taken therefrom and used without further chemical treatment.

The speed of the flow during the washing in the tank H is regulated in such a way that it does not exceed 0.25 millimeters per minute; a system of tubes is placed over the bottom of the boiler in order to divide the flow over the whole section of the boiler. The alkaline earths, soaps and the specifically heavier constituents of the wool grease rise only a little during the washing in the tank H, while the specifically lighter wool grease,

which is at the same time the desired low melting grease, is finally entirely carried away by the water. This washing water contains only neutral grease free from soap, is almost white, and is manufactured directly without any further chemical treatment into the neutral low melting wool grease. It has further been found that the washing process may be facilitated if the specific gravity of the washing water be so far raised by dissolving therein any suitable indifferent salt, that the alkaline earth soaps remain somewhat heavier than the saline solution of the washing water. This latter has then about 1.025 to 1.040 specific gravity, but this figure varies according to the kind and composition of the suint. Chloride of sodium, chloride of potassium, chloride of magnesium or sulphate of magnesium may be named as suitable indifferent salts. The action of all these salts enumerated takes place in a similar manner and equally effectively.

The treatment of the above mentioned washing water, which contains the neutral, low melting wool grease, may take place by filtering off the grease by means of lime, sand, gypsum, or anhydrite-filters, or even by the direct extraction from the water by means of a continuously acting extraction apparatus, preferably by a column extracting apparatus of Mr. H. Hirzel's kind. The washing water traverses this apparatus from above downward, while the extracting substance, benzine or ether, rises in a contrary direction. The supply may be easily so arranged that the pure saline washing solution flows away from below, while a saturated grease solution emerges from the top of the apparatus. This grease solution is clarified, concentrated by means of distillation, and yields finally the desired neutral low melting wool grease. The yield is small and is limited to a small percentage of the total wool grease contained in the wool washing water. This process is therefore characterized by an entirely novel separation of the wool grease into an easily melting part and a more slowly melting part, this separation having up to now been neither carried out technically, nor tested on a small scale nor even proposed; in fact, the existence of such easily melting wool grease was not even known. The washing process for the suint employed for this separation is also a perfectly new mode of treatment in the wool grease industry, more particularly the use of salts for increasing the specific gravity of the washing water. The operation hitherto employed, such as centrifugaling, settling, filtering, injection of alkaline earth salt solutions are all of no value if a separation of the wool grease itself is to be effected, that is to say, if a low melting part and a high melting part are to be obtained. This is only possible by means of the washing process hereinbefore described. The result of this washing is also an entirely novel one, as, by its means, an entirely neutral, greasy water, free from soap, is obtained, which renders superfluous any further chemical treatment of the grease, and allows of an extremely simple extraction with any suitable grease solvent.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. The improvement in the production of neutral wool grease, which consists in immersing the precipitate from wool washings in a liquid having a greater specific gravity than that of wool grease melting below 40° centigrade and a less specific gravity than wool grease melting above 40° centigrade, agitating the precipitate in said liquid, whereby the wool grease of the lesser specific gravity rises, and that of the greater specific gravity settles in said liquid and then removing the wool grease of the lesser specific gravity, substantially as and for the purpose set forth.

2. The improvement in the production of neutral wool grease which consists in removing the sediment from water from wool washings, then precipitating the wool grease in said water, then separating the low melting wool grease from such precipitate by running an upward current of liquid through the precipitate and then removing the low melting wool grease thus separated, substantially as and for the purpose set forth.

3. The improvement in the production of neutral wool grease which consists in precipitating the wool grease and water from wool washings, then separating the low melting wool grease from that melting at the higher temperature in said precipitate, then removing the low melting wool grease after such separation, then dissolving the grease thus removed in a solvent, and then removing the solvent from the grease dissolved therein, substantially as and for the purpose specified.

JOHANN CARL LAHUSEN.

Witnesses:
JOH. LUDW. SCHRAGE,
JOHN H. SCHNABEL.