No. 851,539. PATENTED APR. 23, 1907.

G. MALARD.

DESUINTING APPARATUS.

APPLICATION FILED APR. 2, 1906.

3 SHEETS—SHEET 1.

Fig.1.

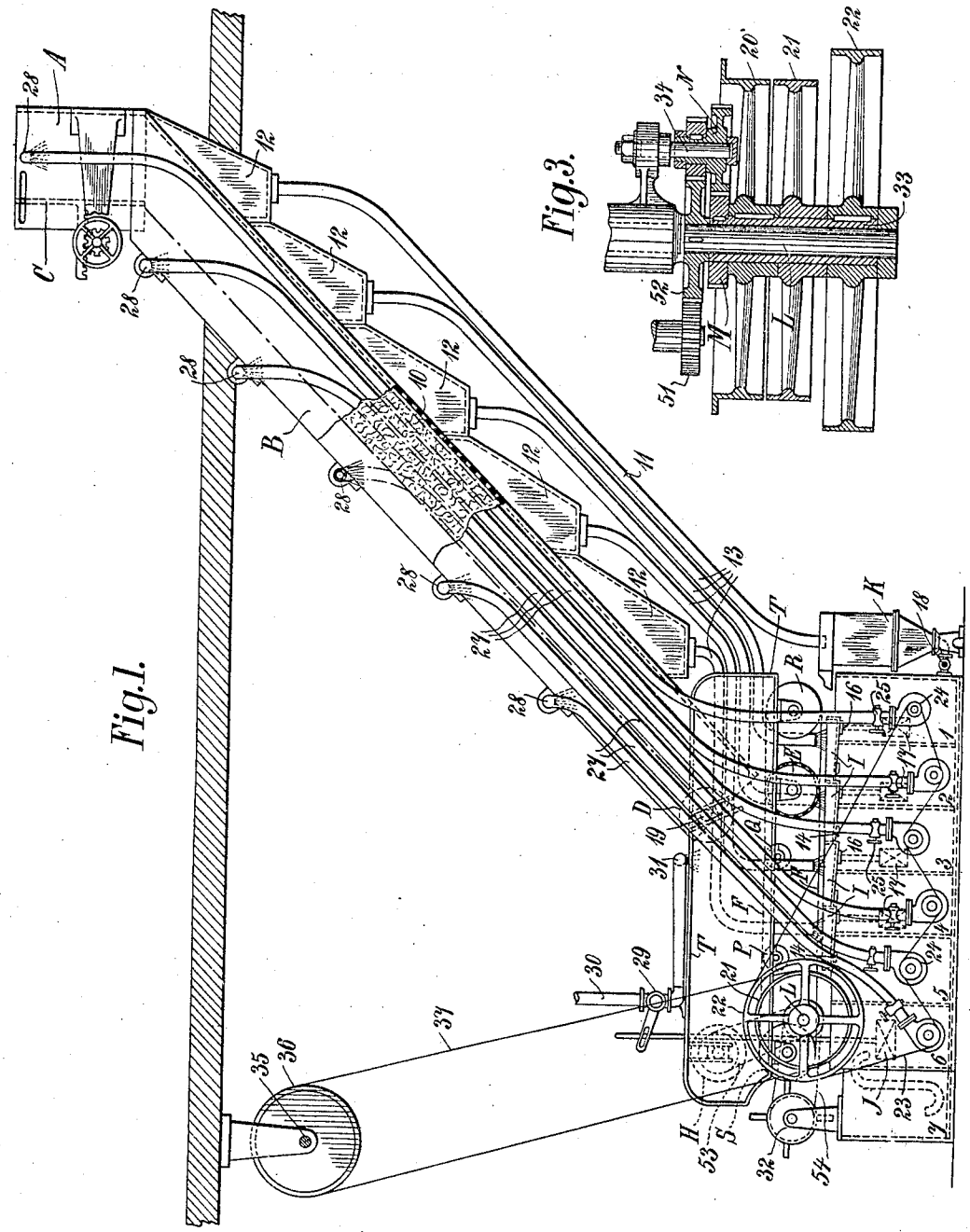


Fig.3.

Witnesses.
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3 SHEETS—SHEET 2.

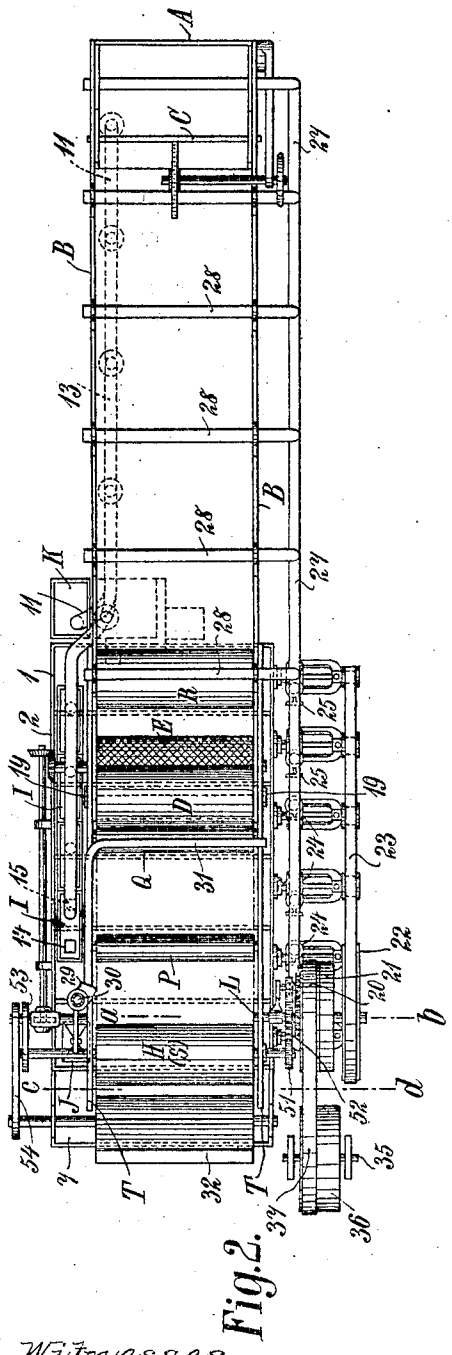


Fig. 2.

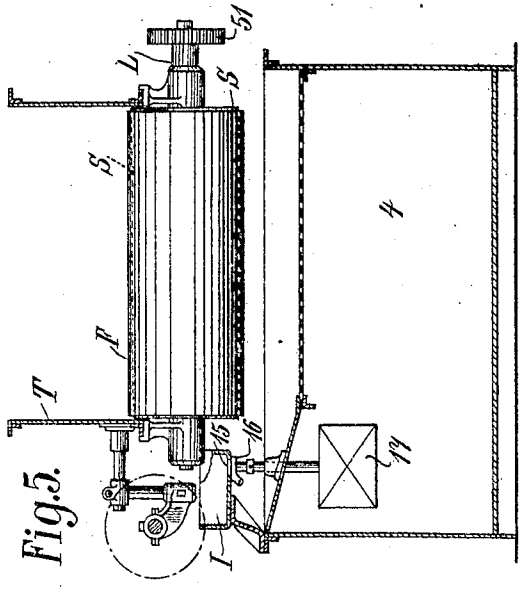


Fig. 5.

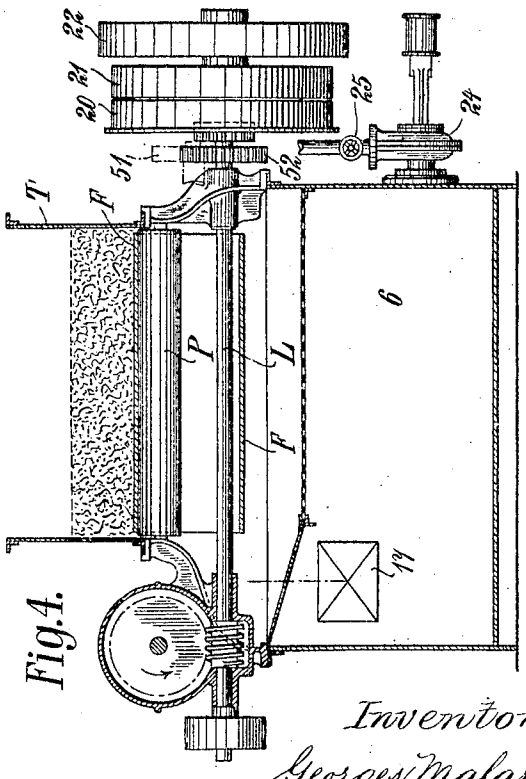


Fig. 4.

Witnesses.
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3 SHEETS—SHEET 3.

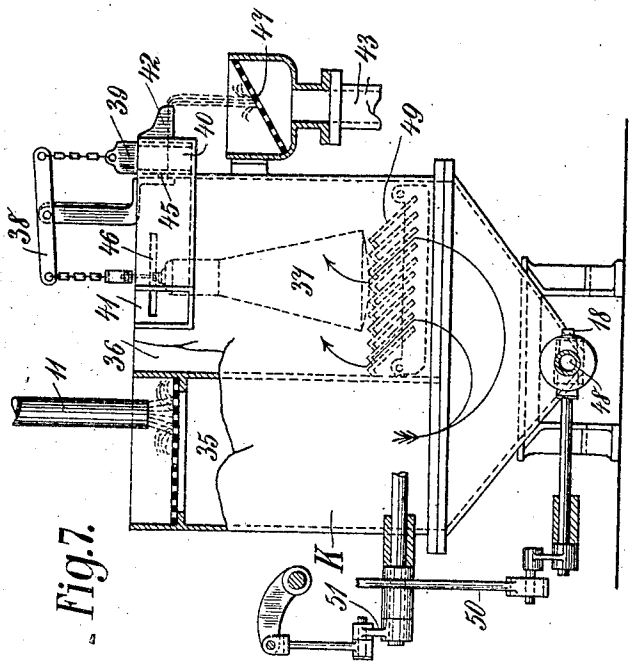


Fig. 7.

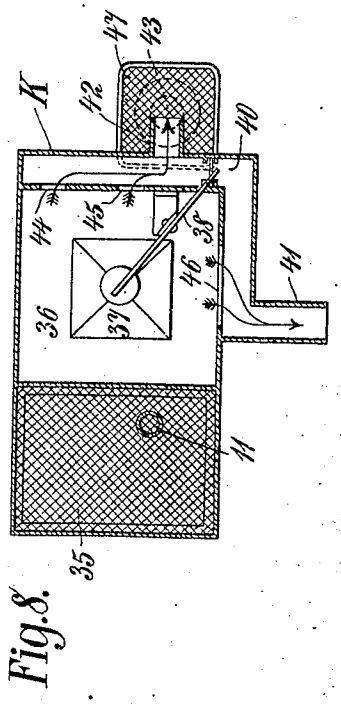


Fig. 8.

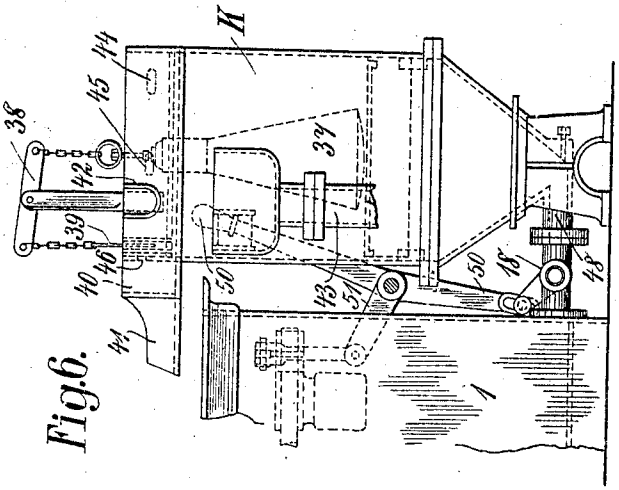


Fig. 6.

Witnesses.
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THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGES MALARD, OF TOURCOING, FRANCE.

DESUINTING APPARATUS.

No. 851,539. Specification of Letters Patent. Patented April 23, 1907.

Application filed April 2, 1906. Serial No. 309,465.

To all whom it may concern:

Be it known that I, GEORGES MALARD, a citizen of the French Republic, residing at Tourcoing, France, have invented certain new and useful Improvements in Desuinting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to desuinting apparatus and has for its object the provision of means whereby the wool will be fed to the apparatus, formed into a sheet or mattress, descend through the apparatus and be desuinted during its descent, and finally be compressed to free it from the final wash water and brought into the washing machine, as will be more particularly hereinafter described and claimed.

Referring to the drawings in which like parts are similarly designated—Figure 1 is a side elevation, partly in section. Fig. 2 is a plan. Fig. 3 is a detail of the main driving shaft and parts thereon, partly in section. Fig. 4 is a section on the line *a*—*b* of Fig. 2, on a larger scale. Fig. 5 is a section on the line *c*—*d* of Fig. 2, the section being made only in the upper part on this line, the lower part is cut through compartment 4, to show clearly the valve of the trough, the details being omitted. Figs. 6, 7 and 8 show the measuring vessel *k* on a larger scale respectively in side elevation, front elevation partly in section and in horizontal section.

The machine comprises an inclined way or channel B of suitable dimensions, preferably, but not necessarily, open at its top, the inclination being in the neighborhood of forty-five degrees. This channel may be of cast iron, of an open metallic fabric, enamelled if desired, of ebonite or armored or wire glass. The bottom of the way or channel B has perforations 10 about four millimeters in diameter arranged quincuncially. The perforations are not to be seen in Fig. 2.

At the top of the channel is a hopper A preferably having vertical sides and located in the second story of the shop. Mounted in the hopper is an adjustable plate C that regulates the thickness of the wool sheet.

Below the channel are collectors 12 into which the wash liquor that has been applied to the wool and has passed through the perforations 10 in the bottom of the channel B is collected and conveyed by gravity through pipes 11 and 13 to the receptacles at the lower level. These discharge pipes are located at one side of the machine and convey wash waters or liquids containing different quantities of suint.

The pipes 13 discharge into trays I that are slightly inclined and straddle receiving compartments 1, 2, 3, 4, 5 of the tank. Each tray has an orifice or discharge opening 14 at its upper end, discharging into the compartment of the two straddled by the tray that contains the less concentrated liquor and a lower opening 15 (being not indicated in Fig. 1 with respect to the clearness of the drawing) controlled by a valve 16 operated by a float 17, thus controlling the discharge from said tray into that compartment of the two straddled by the tray and containing the greater concentrated solution. There is also connected to the compartment 1 a measuring or other vessel K, that can communicate with said compartment through the valve 18, said vessel K receives the solution containing the greatest quantity of suint, since it is the solution with which the wool is first treated in the hopper A and which drains through the channel B into the uppermost collector 12, discharging by pipe 11 into the vessel K.

At the bottom of the incline B are a pair of squeezing rolls, the one E being mounted in fixed bearings and the one D in yielding or adjustable bearings 19, so that the sheet of washed or desuinted wool will be squeezed and at the same time drawn from the channel by these rolls. The roll E is preferably perforated, so that the liquid can be more readily expressed, the liquid passing into the interior of the rolls is discharged at the inferior part of the surface.

There is a main driving shaft L carrying a fast and loose belt pulley 20 and 21 and a driving pulley 22 that drives a continuous belt 23, said belt operating a number of pumps 24, one pump for each of the compartments 1 to 6. These pumps may be of any suitable or convenient kind, centrifugal, semi-rotation pumps or piston pumps. I have indicated in the drawings rotary or centrifugal pumps 24 having cocks or valves 25 controlling the quantity of liquid pumped

onto the wool from any one compartment. The wheels or belt pulleys operating the pumps and around which the belt 23 passes gradually decrease in size from the last compartment 6 to the first compartment 1 where the lift of the liquid is greatest. These pumps each deliver the liquid by means of pipe 27, terminating in a sprinkler pipe 28 onto the wool in the inclined channel or way B. Each of these sprinkler pipes 28 is at a different level and located about over the rear wall of the collector 12 just below it.

The vessel K comprises two compartments 35, 36 which are in connection in the lower part forming thus a siphon. In the compartment 36 a series of baffle plates 49 are arranged which retain the impurities of the liquid passing through the apparatus and also serve to moderate the turbulent motion of the liquid. In the said compartment an aerometer or float 37 is suspended at the one end of a double arm lever 38 the other end of which actuates a sliding shutter 39 in such a manner that, if the density of the solution increases the channel 40 which leads the overflowing liquid to the outlet 41 is closed more or less, the liquid now finding its way-out more or less through the orifice 42 falls through a sieve 47 into a conduit 43 which leads into the potash factory. The channel 40 is in communication with the compartment 36 through two openings 44, 45 provided in the wall of said compartment. In a level somewhat higher than these openings there is another opening 46 which allows the liquid to run over and back through the outlet 41 into the compartment 1, if the pipe 11 should feed more than the openings 44, 45 can carry off.

The tapered bottom of the vessel K has a discharge pipe 48 which connects the said vessel with the compartment 1 in order to be able to clean the vessel K from the residues. The pipe 48 is provided with a cock 18 being automatically operated in connection with the device 50, 51 for starting the machine by means of a leverage (50, 51) so that, when the machine is stopped the cock 18 is opened and when the machine is started the said cock is closed.

The float J in the last compartment 6 operates a stop cock 29 controlling the discharge of fresh liquid or water from the supply pipe 30, terminating in a sprinkler pipe 31 just beyond the squeezing rolls D–E.

The wool leaves the inclined way B at the bottom and by means of the rolls D, E is squeezed and delivered onto a table or endless perforated or unperforated carrier F passing over the rolls S, P, Q, R, and driven by the roll S and being flanked by leading plates T, the roll E also serving to support the carrier. In Fig. 2 the carrier F is omitted to show more clearly the details. The roll S is driven by means of the gearing wheels 51, 52 (not shown in Fig. 1) from the main shaft L.

H is a roller placed opposite the one S but at a less distance from S than the roll D is from E, so that the mat or sheet will be squeezed thinner and dryer. The roll H is driven by a belt 53 from the main shaft L.

The final wash water is delivered from the sprinkler pipe 31 onto the wool on the table F and when this table is not perforated may be delivered into a seventh compartment connected to compartment 6 by a syphon, the long leg of which is in compartment 7 and the short leg near the surface of the liquid in compartment 6.

After the wool has passed through the second pair of squeezing rolls S, H, it may be seized by a roll 32 or the like provided with swings and driven by a belt 54 from the shaft L, which roll 32 brings the wool into the washing machine or the like.

On the main shaft L is a loose sleeve 33 on which are mounted the fast and loose pulleys 20 and 21, the belt wheel 22 and the gear wheel M, said gear wheel meshing with the double gear wheel N on stub-shaft 34, that is carried by the main shaft L. The double gear wheel N is a planet wheel driven by the gear wheel M fixed on the sleeve 33. The shaft L is therefore driven from sleeve 33 by the planet gear N and gear wheel 52, said shaft transmitting a slow movement to the squeezing rolls by means of worm and other gear. A main or line shaft 35 and belt wheel 36 transmit movement to the pulley 20.

The operation is as follows: Motion is imparted to the fast pulley 20 from shaft 35 and pulley 36 by belt 37. The speed of belt pulley 22 that drives the pumps is comparatively fast to the speed of the squeezer and delivery rolls D, E and S, H driven by shaft L. It is to be understood that there are sufficient wash waters in the compartments 1, 2, 3, 4, 5 and 6 for starting the machine. Wool is packed into the hopper A where the more concentrated liquor from tank or compartment 1 is sprayed onto it by the uppermost sprinkler pipe 28. This pump having the smallest driving pulley operates at a greater speed on account of having to raise the liquor from tank 1 to the greatest elevation. The wool in hopper A, since it is put in dry will absorb or hold a larger quantity of water or liquor than at any other point of its course through the machine, since here it forms a high filtering column and the most concentrated liquor delivered to it will be practically saturated with suint as it passes through the perforated inclined way B into the uppermost collector 12, whence it is delivered by gravity through pipe 11 to the measuring vessel K. The wool travels as a sheet down the inclined perforated way B and at different points the several sprin-

kler pipes 28 deliver onto it water containing less and less suint, these waters passing through the wool into the collectors 12 are delivered by pipes 13 into the trays I that straddle the compartments of the tank. These trays being inclined so as to deliver into the compartment containing the more concentrated suint solution, so that when the required level in any one compartment has been reached the float valve contained therein will close the lower opening in the tray I and cause the liquor to be delivered into the preceding compartment until the liquid level again falls by reason of the action of the pump. Thus it will be seen that the floats maintain substantially a constant liquid level in the tank and this liquid level controls the quantity of water supplied to the entire machine, through the medium of the float J in compartment 6 and operating the inlet valve 29. The sheet of wool will not slide freely down the incline and bunch at the bottom, the inclination being such that the squeezer rolls D and E will pull it out onto the belt or table F where clean water from sprinkler pipe 31 will give it the final washing. It is finally squeezed between the rolls S, H and seized by the roll 32.

I claim:

1. In a desuinting apparatus, the combination with an inclined way over which the wool travels, of a number of independent chambers to contain liquid of different degrees of saturation, means to pump the liquid from said chambers onto the wool on said way at different levels and means to return the liquid to the chambers.

2. In a desuinting apparatus, the combination with an inclined way over which the wool travels, of a tank having a number of independent chambers to contain liquid of different degrees of saturation, means to pump the successive liquids to successive elevations onto the wool, means to return liquid from the several elevations to the chamber containing the liquid next higher in saturation and means to collect the first washing of the wool and automatically discharge it.

3. In a desuinting apparatus, the combination with an inclined way, of a tank divided into independent chambers, trays straddling the chambers, pumps to pump the liquid onto the way at different elevations, means to collect the liquid passing through the wool on the way at different levels and return it to the trays, and valves in the trays controlled by the liquid level in the chambers.

4. In a desuinting apparatus, the combination with an inclined perforated way having a feed hopper at its top, of a tank divided into independent chambers, inclined trays straddling adjacent compartments, float controlled valves controlling the discharge from the trays into the compartments containing the more saturated liquid of the two straddled, thereby maintaining a constant liquid level in the tank, means to return all of the liquid from the several levels but the highest to the trays, means controlled by the liquid level in the tank to regulate the supply of liquid.

5. In a desuinting apparatus, the combination with an inclined way for the wool, of a tank divided into independent chambers, means to pump the liquid of said chambers to different levels on the tray, means to return the liquids to the chambers containing the liquid of the required concentration, means to squeeze the wool as it leaves the way, means to give it a final washing with water free from suint and means to squeeze it after this washing.

6. In a desuinting apparatus, the combination with an inclined perforated way for the wool having a feed hopper at the top, means to vary the size of the hopper to control the thickness of the sheet of wool moving over the way, collectors below the hopper, a tank divided into separate chambers, inclined trays at the sides of the tank straddling adjacent chambers and on which collectors discharge and having an upper and a lower delivery orifice, floats to control the delivery from the lower orifice and thereby maintaining a uniform liquid level in the chambers, rotating pumps for each chamber, the speeds of which increase in accordance with the lift and said pumps delivering liquid from the respective chambers onto the wool at different levels, squeezing rolls at the end of the way, an endless carrier onto which the wool is delivered by the rolls a liquid supply delivering liquid onto the table and controlled by a float in the tank, a second pair of squeezing rolls at the end of the table.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GEORGES MALARD.

Witnesses:
CHAS. AYORCHE,
EDW. SORELL.