

W. E. LAYLAND & J. H. WHITEHEAD.
 APPARATUS FOR DRYING WOOL AFTER WASHING.
 APPLICATION FILED APR. 24, 1908.

920,351.

Patented May 4, 1909.
 2 SHEETS—SHEET 1.

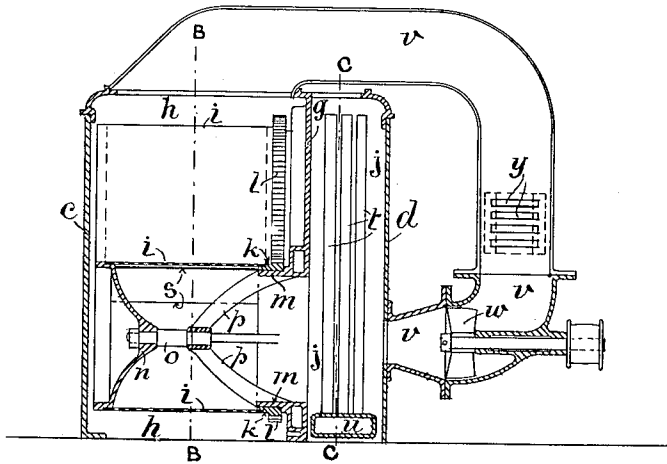


FIG. 1.

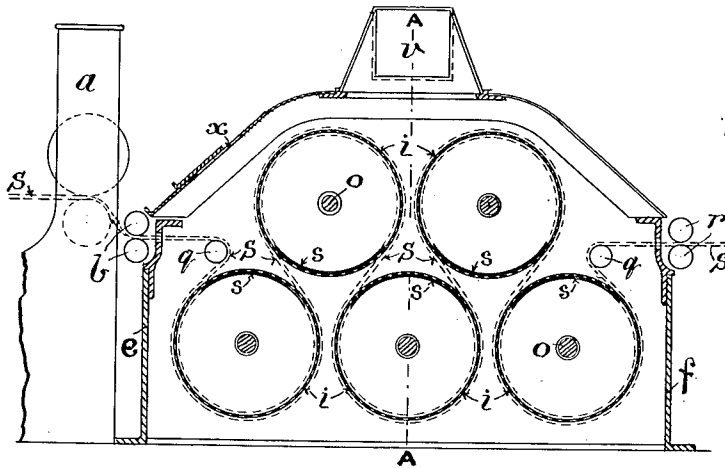
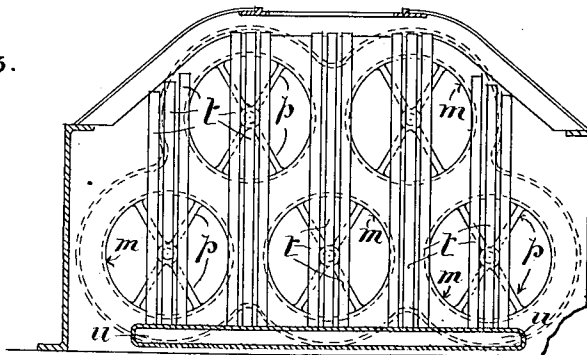


FIG. 2.

FIG. 3.



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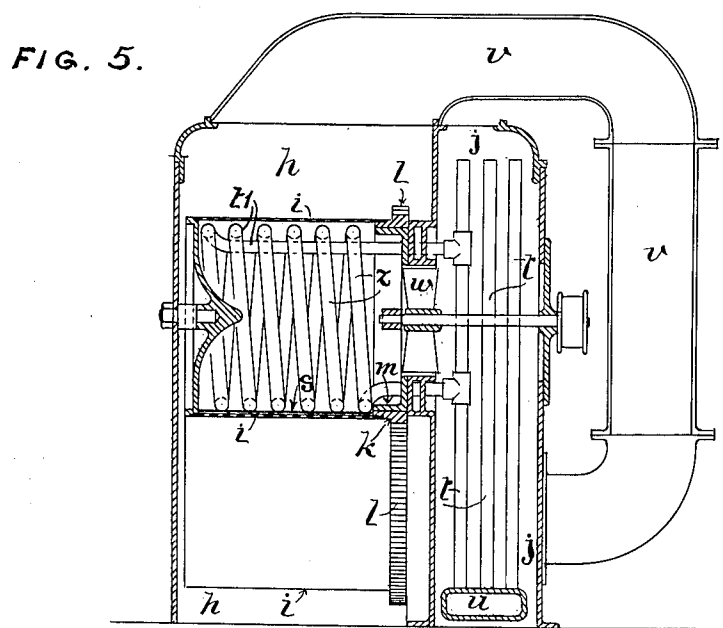
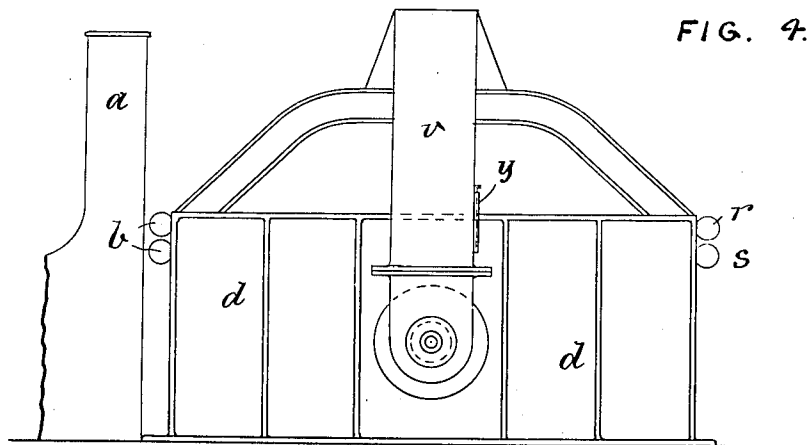
Inventors

William Edward Layland
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UNITED STATES PATENT OFFICE.

WILLIAM EDWARD LAYLAND, OF LEEDS, AND JOHN HENRY WHITEHEAD, OF APPERLEY BRIDGE, ENGLAND.

APPARATUS FOR DRYING WOOL AFTER WASHING.

No. 920,351.

Specification of Letters Patent.

Patented May 4, 1909.

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To all whom it may concern:

Be it known that we, WILLIAM EDWARD LAYLAND, a subject of the King of Great Britain and Ireland, residing at Leeds, in the county of York, and JOHN HENRY WHITEHEAD, a subject of the King of Great Britain and Ireland, residing at Apperley Bridge, in the county of York, England, have invented a certain new and useful Improved Apparatus for Drying Wool After Washing, for which we have applied for Letters Patent in Great Britain and Ireland, No. 17,108, bearing date July 26, 1907, and of which the following is a specification.

Our invention relates to apparatus used for drying wool more particularly in connection with back washing machines, and in which the sliver is carried around a series of revolving hollow cylinders of perforated sheet metal in such a manner, that first one side of the sliver comes in contact with one of the cylinders and then the other side in contact with the second cylinder, then the first side in contact with the third cylinder and so on. At the same time heated air is drawn or forced from the interior of the cylinders through the perforations and through the sliver.

Now the object of this invention is to utilize to the utmost the drying capacity of the air, by preventing leakage of air through the portions of the cylinders for the time being not covered by the slivers, and only allowing the air to escape from the machine and to be replaced by fresh air, when it has taken up all or nearly all the moisture it is capable of holding, that is when it is saturated or nearly saturated with moisture; by causing the air to be repeatedly circulated around that is within the apparatus, and consequently repeatedly passed through the sliver; and providing openings for the escape of saturated air and the entrance of fresh with adjustable covers, which can be so regulated or adjusted, that the escape and admission of air keeps even pace with the rate at which the saturation of the air takes place.

Referring to the drawings which form part of this specification, Figure 1 is a cross section on line A A of Fig. 2 of a drying apparatus or machine constructed according to this invention. Fig. 2, is a longitudinal section through the cylinder chamber, that is on line B B of Fig. 1. Fig. 3, is a longitudinal section through the heating chamber, that is on

line C C of Fig. 1. Fig. 4, is an outside elevation. Fig. 5, is a cross section showing a modification in the arrangement of the means for heating and circulating the heated air.

In all the figures, the same letter is used to indicate the same or corresponding part.

a, Fig. 2, is the squeezing head of the back washing machine, delivering the washed wool *i. e.*, the sliver, to the feeding rollers *b* feeding the washed wool into the drying machine.

c and *d* are respectively the back and front sides, and *e* and *f*, the receiving and delivery ends of the casing of the drying machine.

g Fig. 1, is a partition dividing the interior of the machine into a cylinder chamber *h* and a heating chamber *j*.

i are the drying cylinders formed of perforated sheet metal, carried at one end by rings *k*. Each ring has a gear wheel *l* formed on or affixed to it, so that all the cylinders are geared together and driven at a uniform speed. The rings *k* fit rotatably on turned ring races *m*, bolted to or cast on the partition *g*, around circular openings cast in the partition. The opposite ends of the cylinders are attached to and carried by coned disk center pieces *n*, which close in this end of the cylinders. The center pieces *n* are mounted rotatably on stud pins *o* carried by crossed arch supports or brackets *p* from the fixed ring races *m*.

The dotted lines *S* Fig. 2, indicate the sliver being carried around the cylinders *i*.

q are guide rollers and *r* are delivery rollers. The means for imparting motion to the cylinders do not form part of this invention, and as such are well known they are with the exception of the connecting gear wheels *l* omitted from the drawings.

t are nests of vertical steam pipes fixed in the upper side of the steam box *u* situated at the bottom of the heating chamber *j*, and connected with some source supplying steam.

w is a fan forcing air into the heating chamber *j* where it is heated. The heated air then passes through the openings in the partition *g* into the interior of the cylinders *i*, and escapes therefrom through the perforations in the cylinders and through the sliver surrounding the cylinders.

It will be seen from Fig. 2, that the sliver *S* carried successively around with the perforated cylinders *i*, covers at any time only three fourths or thereabout of the circum-

ference of each cylinder; leaving one fourth uncovered, through which the air would escape without carrying off any moisture from the sliver. Now according to this invention we cover this one fourth or thereabout of each cylinder with a stationary baffle plate *s*, secured to the fixed ring race *m* or the bracket *p*. This baffle plate *s* is most suitably placed within the cylinder. In this manner the air is prevented from escaping direct from the interior of the cylinder, and is compelled to pass through the sliver, carrying off part of the moisture contained in the sliver with it. Further owing to the short time the heated air is in contact passing through the sliver, it cannot with one passage through the sliver carry away all the moisture it is capable of holding. To avoid the waste of heat from this cause, according to this invention we connect the upper part of the cylinder chamber *h* with the lower part of the drying chamber *j* by means of a large pipe or passage *v*, and we place the fan *w* in this passage, conveniently near its junction with the heating chamber *j*. By this means the heated air is caused to circulate repeatedly within the drying machine, that is to pass repeatedly through the sliver, so that it has the opportunity of taking up all the moisture which owing to its temperature it is capable of doing; that is of becoming saturated. To allow of the escape of the saturated air and the admission of fresh air, we provide an opening or openings *x* and *y*, fitted with movable, grated covers or shutters, so that the size of the opening can be regulated in such a manner as to keep the air circulating till it is nearly saturated before escaping. If this is too low, the shutters or covers are adjusted to reduce the opening.

In Fig. 5 each cylinder is provided with a circulating fan *w* in the corresponding opening in the partition *g*, and a coil *z* of heating pipes is placed within the cylinder in addition to the pipes *t* in the heating chamber *j*.

It will be understood from what we have said at the commencement of this specification, that drying machines with perforated cylinders through which heated air has been passed, have been used before, we do not therefore claim such a combination broadly.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. The combination in a wool drying machine of a casing, a partition *g* dividing the same into a heating chamber *j*, and a drying

chamber *h*, a series of hollow perforated revolving cylinders *i* within the drying chamber closed at one end and open at the other end, the open ends coinciding with openings in the partition *g*, baffle plates *s* fitted against the portion of the circumferences of the cylinders *i* for the time being uncovered by the sliver, heating pipes *t* situated in the heating chamber *j*, an air circulation pipe *v* from said drying chamber to said heating chamber, a fan *w* in the path of the air current and discharge and inlet openings *x y* all substantially as set forth.

2. The combination of perforated hollow cylinders arranged in two rows one above the other and in alternating order and adapted to have a current of heated air pass through them with means for moving and guiding the sliver which passes from row to row of said cylinders alternately over and under them as shown and baffle plates arranged within said cylinders to cover the perforations of those parts of them over which the sliver does not pass substantially as set forth.

3. In a wool drying machine the combination of a partition *g* with openings therein, wheel races *m* around said openings, hollow perforated cylinders *i*, closed at one end *n*, and open at the other end, gear wheel *l* to said open ends of the cylinders fitting said wheel races *m*, all substantially as set forth.

4. In a drying machine the combination of a heating chamber, a drying chamber and their casing with a pipe making connection between them and means for controlling the inflow of fresh air to the interior of the casing and the discharge of moist air therefrom substantially as set forth.

5. In a wool drying machine the combination of a cylinder chamber *h*, a partition *g* or wall of the same with circular openings therein, fans *w* fitted in said openings, revolving perforated cylinders *i* with one of their ends open and coincident with said openings, stationary steam heating pipes *z* within said cylinders and baffle plates *s* all substantially as shown in Fig. 5 and specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM EDWARD LAYLAND.
JOHN HENRY WHITEHEAD.

Witnesses:

J. CLARK JEFFERSON,
W. S. EDMONDSON.