P. SCHILDE.

APPARATUS FOR MOISTENING YARNS.

APPLICATION FILED DEC. 10, 1907.

955,001. Patented Apr. 12, 1910.

Fig. 1

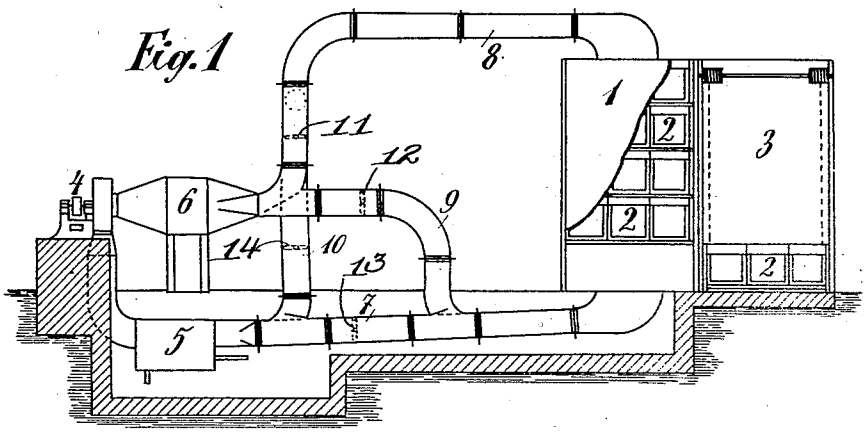
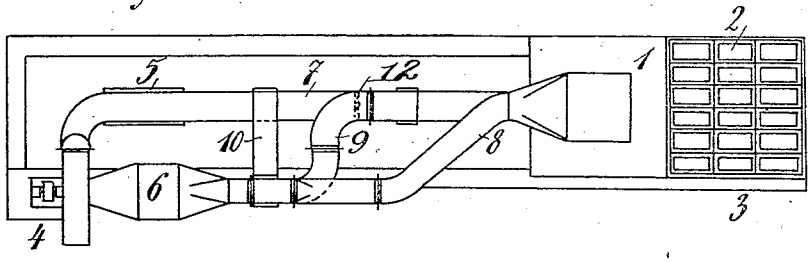


Fig. 2.



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UNITED STATES PATENT OFFICE.

PAUL SCHILDE, OF HERSFELD, GERMANY.

APPARATUS FOR MOISTENING YARNS.

955,001. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed December 10, 1907. Serial No. 405,974.

To all whom it may concern:

Be it known that I, PAUL SCHILDE, a subject of the Emperor of Germany, residing at Seilerweg A26', Hersfeld, Hessen-Nassau, a Province of Prussia, Germany, engineer, have invented certain new and useful Improvements in Apparatus for Moistening Yarns, of which the following is a specification.

The object of this invention is to produce apparatus adapted to impart a certain percentage of moisture to yarns etc. made in the yarn factories. As a matter of fact these yarns leave the looms and the warm spinning rooms in a dry state and consequently have a great inclination to form loops, get entangled, or get into knots, thus rendering further manufacture, weaving etc. very difficult. It is furthermore of advantage to and facilitates business if the yarns contain a certain agreed upon and adhered to percentage of humidity and hitherto factory owners have tried in vain by various means to obtain and maintain this degree of moisture in their yarns. Especially with yarns on spools (cops, cross-wound bobbins etc.) it is difficult to quite evenly moisten the yarn and the present invention will entirely do away with this disadvantage.

In the accompanying drawings Figure 1 is a partly sectional elevation, and Fig. 2 is a ground plan of my yarn moistening apparatus.

The apparatus hereinafter described and specified comprises a chamber or shaft into which finely distributed or evaporated water is forced by means of a strong current of air, which may be warmed or heated previously as circumstances require. In the chamber or shaft there are a number of trays to receive the baskets which contain the yarns to be treated. These trays consist of open frames, or they have bottoms made of wire netting or the like, and the baskets have sides and bottoms which are perforated or made of open wirework of suitable mesh. The moistened air of necessity is forced through the cops or bobbins lying in the baskets and during its passage therethrough gives up a part of its moisture to the yarns. Thereafter the air is sucked off from the chamber, the apparatus being so constructed as to regularly alter the direction of the current of air, *i. e.* to send same alternately up and down the chamber or shaft.

Referring to the drawings; the moistening chamber or shaft 1 consists of a closed iron frame, inside which the trays 2 are arranged so as to be moved up and down. For technical reasons the downward movement is generally chosen. Adjacent to the chamber or shaft or, in case of more important installations, between two chambers or shafts, there is a lift 3 with a hoist by means of which the trays 2 are separately lifted or let down, as the case may be, by mechanism which forms no part of the present invention.

If the trays 2 inside the chamber or shaft 1 are moving downward (which will be generally the case) those inside the lift will move upward and vice versa. The construction of the apparatus is such as to permit of the mechanical movement at any time of the lowermost tray in the moistening chamber or shaft 1 from said shaft into the lift 3. The whole remaining column of trays afterward descends inside the chamber or shaft, thus making room for a new tray at the top. The tray taken out from the bottom is then discharged and filled again with baskets containing fresh dry yarns, and then hoisted up by the lift 3 to the top of the shaft 1 to be there placed uppermost on the column of trays 2 therein. The lift 3 descends again and the whole operation may be repeated. Of course there must be suitable intervals between the emptying of the bottom trays to allow of the yarns in the apparatus being subjected for a sufficiently long period to the moistening process, generally speaking for several hours. The apparatus consists further of an air fan 4, and a water distributer or evaporator 5, also, if necessary or desired, of an apparatus or arrangement for warming or heating the air, and finally of connecting tubes.

The water distributer or evaporator 5 may be constructed after any of the well known patterns. The steam is absorbed by the current of air while the same passes above the evaporator. The warming or heating apparatus may also be suitably constructed or it may be omitted altogether.

The air fan 4 sucks up the air from the heating apparatus, or from the surrounding atmosphere, forces it through the distributer or evaporator 5 and then through a tube 7 leading to the bottom of the moistening chamber or shaft 1 through which it is subsequently driven. The air after having lost its moisture while traveling through the

chamber or shaft 1 escapes into the open, or is conducted through a pipe 8 either to the heating apparatus 6 or direct to the inlet of the fan. It is possible to reverse the current of air by opening (while the air is being sucked from the chamber or shaft 1) the branch air pipe or tube 9 hitherto closed. The air then first passes into the heating apparatus 6, thence through the fan 4, through the distributer or evaporator 5, and then through a second branch pipe 10, which was hitherto closed, into the pipe 8 ascending to and leading into the top part of the chamber or shaft 1. The closing of the various connecting tubes is effected by means of flap, or other, valves which can be operated from the outside, so as to open communication for the air in either direction. The pipe 8 is provided at a point below its junction with the pipe 10, with a valve 11. The pipe 9 is provided with a valve 12; the pipe 7, with a valve 13 and the pipe 10 with a valve 14. With this arrangement, it will be seen that when air flows through the pipe 7, upwardly through the shaft 1 and returns through the pipe 8, the valves 13 and 11 are opened and the valves 12 and 14 closed. When the direction of the air current is reversed, the valves 11 and 13 are closed and the valves 12 and 14 are opened. In such a case the air will pass through the moistener 5, the pipes 10 and 8, downwardly through the shaft 1, being returned by the pipes 7 and 9 and the heater 6. By taking advantage of this arrangement, viz., forcing the moist air into the shaft alternately from above and from below, the result aimed at to subject all the yarns evenly and equally to the influence of the air and thereby imparting to them an equal degree of moisture throughout, is most effectually attained.

A single moistening installation composed of a fan, evaporator or distributer, with the necessary tubing and flaps or valves, may feed a number of moistening shafts, and several shafts may be arranged in such a manner as to necessitate only one lift.

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

1. In an apparatus for moistening yarns, in combination, a shaft to receive trays containing yarns to be moistened, an air fan, a heater connected thereto, a water chamber connected to the air fan, a pipe connecting the water chamber and the lower end of the shaft, and a pipe connecting the upper end of the shaft and the heater.

2. The combination with a moistening shaft and means for passing material therethrough, of a pipe connected to the upper end of the shaft, a pipe connected to the lower end of the shaft, a water chamber common to the pipes, an air fan common to the pipes and means for causing the air forced by the fan to flow in either direction desired through the shafts and through the pipes.

3. The combination with a moistening shaft and means for passing material therethrough, of a pipe connected to the upper end of the shaft, a second pipe connected to the lower end of the shaft, a heater connected to the first pipe and means also connecting the heater and the second pipe, a water chamber communicating with the second pipe and means also connecting the water chamber and the first pipe, and a fan connected to the heater and also to the water chamber.

4. In an apparatus for moistening yarns, in combination, a shaft to receive the trays containing yarns to be moistened, an air fan, a heater connected thereto, a water chamber connected to the air fan, a pipe 7 connecting the water chamber and the lower end of the shaft, a pipe 8 connecting the upper end of the shaft and the heater, a pipe 9 connecting the pipe 7 and the pipe 8, and a pipe 10 leading from the pipe 7 between the water chamber and the pipe 9 and connected to the pipe 8 above the pipe 9.

5. In an apparatus for moistening yarns, in combination, a moistening shaft, pipes connected to the upper and lower ends of the shaft, an air fan, a pipe connected to the air fan and having connection with both of said first named pipes, a water chamber in said last named pipe and means to return air to the air fan from either of said first named pipes.

6. In an apparatus for moistening yarns, in combination, a moistening chamber, a pipe connected to the lower end thereof to conduct air thereto, a pipe connected to the upper end thereof to conduct air thereto, an air fan, a pipe connecting the air fan with both of the first named pipes, a water chamber in the last named pipe, and means whereby air forced continuously in one direction by the air fan through the water chamber may be delivered to the drying chamber at either end thereof through either one of said first named pipes.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses this 21st day of November 1907.

PAUL SCHILDE.

Witnesses:
JEAN GRUND,
CARL GRUND.