

United States Patent Office.

IMPROVEMENT IN MACHINE FOR DRYING YARN.

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SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HUGH WHITEHILL, of Newburgh, in the county of Orange, and State of New York, has invented certain new and useful improvements in Apparatus for Drying Yarns; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of an apparatus constructed according to my invention.

Figure 2 is a vertical transverse section taken in the line *x x* of fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to an improved construction of an apparatus for drying yarns, and is designed more particularly to be attached to, or to form part of, the machinery employed for dressing the same. The invention consists in so combining a cylindrical shell or casing with the slatted cylinder around which the yarns are passed during the drying operation, that any undue escape or dissipation of the heat from the immediate neighborhood of the yarns while passing around the aforesaid slatted cylinder is efficiently prevented. The invention further consists in certain novel means of insuring an equal and uniform heating of the air employed in the drying operation, and the consequent uniform drying of the yarns.

To enable others to understand the construction and operation of my invention, I will proceed to describe it with reference to the drawings.

A indicates two vertical circular end pieces, which are supported by suitable legs, *a*, and which constitute the framework upon which the other parts of the apparatus are sustained. The end pieces A are connected with each other and retained in their proper upright position by means of a fixed cylinder, B, which is secured at each end to one of the said end pieces, and is made of sheet metal or other suitable material. This fixed cylinder constitutes the outer shell or casing of the apparatus, as will be hereinafter fully set forth, and is furnished, at its upper side, with a longitudinal slot or opening, B'. C represents two longitudinal rollers, which are situated at a height a little above that of the upper side of the cylindrical shell or casing B, one at each of the opposite sides of the opening B', with the ends of their shafts working on suitable bearings, *b*, formed upon the end pieces A. Each of the end pieces A is furnished with a transverse horizontal bar, *c*, above one of which is an opening, A', formed through the sheet metal of which the central portion of the said end pieces are formed; and formed or fixed upon the upper side of the said transverse bars are bearings, *d*, which support a shaft *e*, which extends longitudinally through the centre of the shell B, and has secured upon it a fan-wheel D. E represents a system of steam or heating pipes, which are arranged longitudinally within the shell B, in and concentric with the fan-wheel D, the ends of the aforesaid longitudinal heating pipes being connected by the transverse pipes, *f*', which extend across the inner sides of the end pieces A, at a little distance therefrom, as shown more clearly in fig. 2. The steam or heating pipes enter the shell B near the top or upper side thereof, as at *g*, and make their exit therefrom, near the bottom, as at *h*. By thus arranging the heating pipes within the shell B, the heating steam is steadily conducted downwards from the top to the bottom of the shell, and the equal and uniform heating of the air within the said shell throughout the entire length thereof is very perfectly obtained. Situated in each of the spaces between the end pieces A and the transverse pipes *f*', just described, is any suitable number of friction rollers, F, the uppermost ones of which are supported in suitable brackets, *m*, attached to the inner sides of the end pieces A, while the others are supported by bearings formed in the inner sides of the said end pieces. These friction rollers are arranged concentrically with the central shaft *e*, and at such a distance therefrom that the outermost portions of their peripheries extend beyond the longitudinal heating pipes E, as is more plainly represented in fig. 2. At G is shown a slatted frame of cylindrical form, which is composed of flat rings, *n*, arranged side by side at suitable distances apart, and connected together by longitudinal bars or braces, *r*; the said rings, *n*, having any desired number of longitudinal slats, *s*, secured edgewise in their peripheries, with the outer edges of the said slats, *s*, projecting outward somewhat beyond the aforesaid peripheries of the rings. The two end or outermost of the rings, *n*, are placed, one upon the friction rollers F at one end of the shell A, while the other is placed upon those at the opposite end of the said shell, in such manner that the said friction rollers constitute bearings for the slatted frame G, which is supported by and permitted to rotate thereon. I is a fixed guard or shield, which is secured upon the two uppermost of the longitudinal heating pipes E, immediately underneath the central part of the opening B', and within the slatted frame G. The office of this shield or guard is to prevent the too rapid outflow of the heated air from

the interior of the shell A through the aforesaid central portion of the opening B', which would interfere with the uniform heating of the air within the shell or casing.

The operation of the invention is as follows: The yarns are placed side by side so as to form a kind of sheet the whole length of the rollers C, the said yarns being first passed over one of the said rollers, C, then downward through the opening B', and under and around the slatted cylinder G, and thence upward over the other or opposite roller C, whence it is drawn forward and away from the said roller at any desired or proper speed by any ordinary or appropriate means. The yarns are thus passed around the slatted cylinder G, between the heating pipes E and the shell or casing, the said slatted cylinder being rotated by the yarns as they pass under and around it, and thus prevent any dragging of the yarn upon the same or any interference with the proper forward movement of the yarns. At the same time a rotary motion is given to the fan-wheel D by means of a pulley, *a'*, secured upon the one of the shaft *e*. This motion of the fan-wheel D causes air to be drawn into the interior of the apparatus through the opening A', and this air being heated by the heating pipes E is forced or thrown outward toward the shell B by the fan-wheel D, and is consequently driven through and between the yarns as they pass around the slatted cylinder G, as just set forth, and effectually dries the yarns. The air, as it cools, passing out through the opening B' at the same time that the shell or casing A, by preventing the heated air from being thrown radially outward from the immediate neighborhood of the yarn while passing around the slatted frame and the guard I, preventing a too rapid outflow of the air through the central portion of the opening B', avoids any undue waste of heat, and consequently enables the drying operation to be carried on with a greatly reduced expenditure thereof; while, furthermore, the arrangement of the heating pipes E and *f'* conduct the heat steadily and regularly downward, as hereinbefore explained, and thus secure the equal heating of the air at all parts of the interior of the apparatus, and consequently the uniform drying of the yarns.

What I claim as new, and desire to secure by Letters Patent, is—

1. The system of heating pipes E, connected at both ends by transverse pipes *f*, forming a continuous passage for the steam through the entire system, arranged and operating with relation to the revolving slatted cylinder G and fan D, substantially as and for the purpose set forth.
2. The guard or shield I, arranged in relation with the opening B' of the shell or casing B, substantially as herein set forth for the purpose specified.
3. The arrangement and combination of the revolving slatted cylinder G, with the casing A, B, and system of heating pipes E, substantially as and for the purpose specified.

HUGH WHITEHILL.

Witnesses:

JAMES WHITEHILL,
EUGENE CASS.