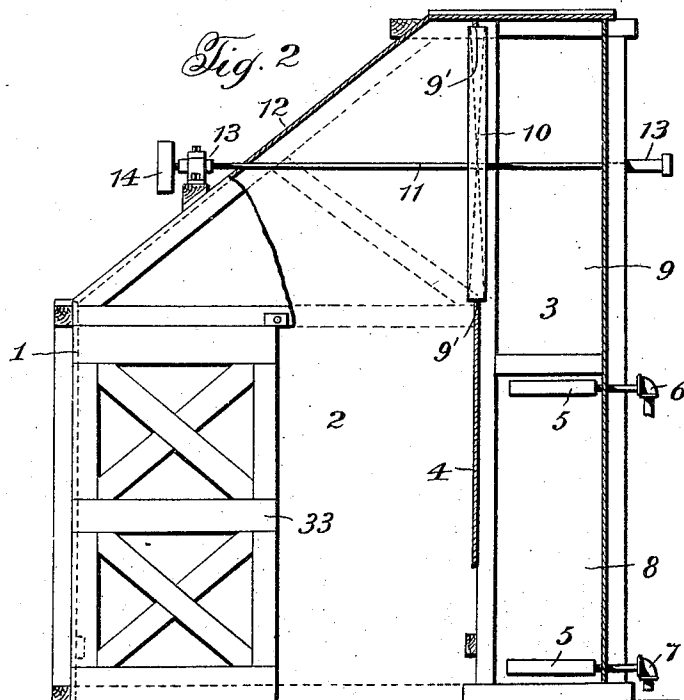
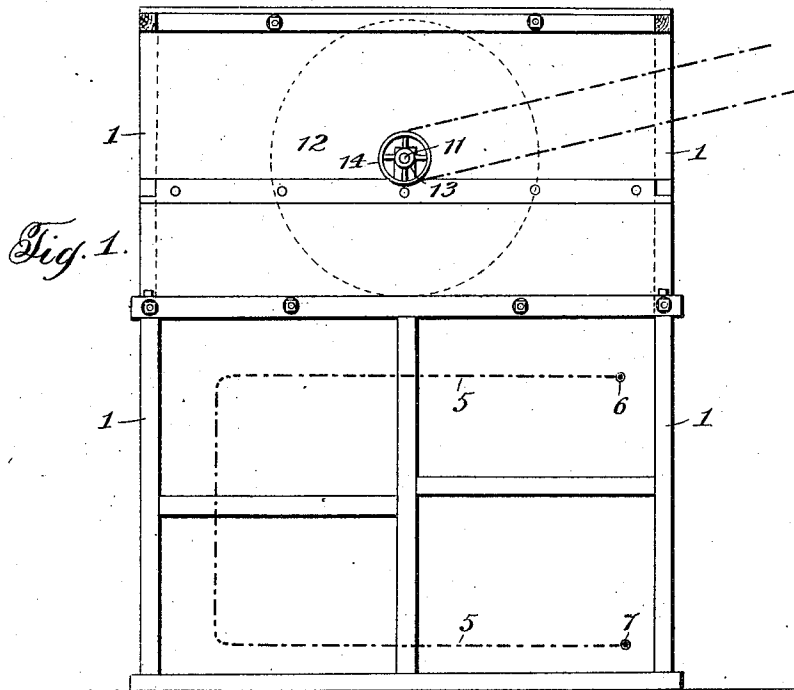


T. ALLSOP & W. W. SIBSON.
MACHINE FOR DRYING YARN.
APPLICATION FILED DEC. 4, 1907.

934,127.

Patented Sept. 14, 1909.
3 SHEETS—SHEET 1.



Witnesses:

James Hutchinson:
M. C. Tucker.

Inventors

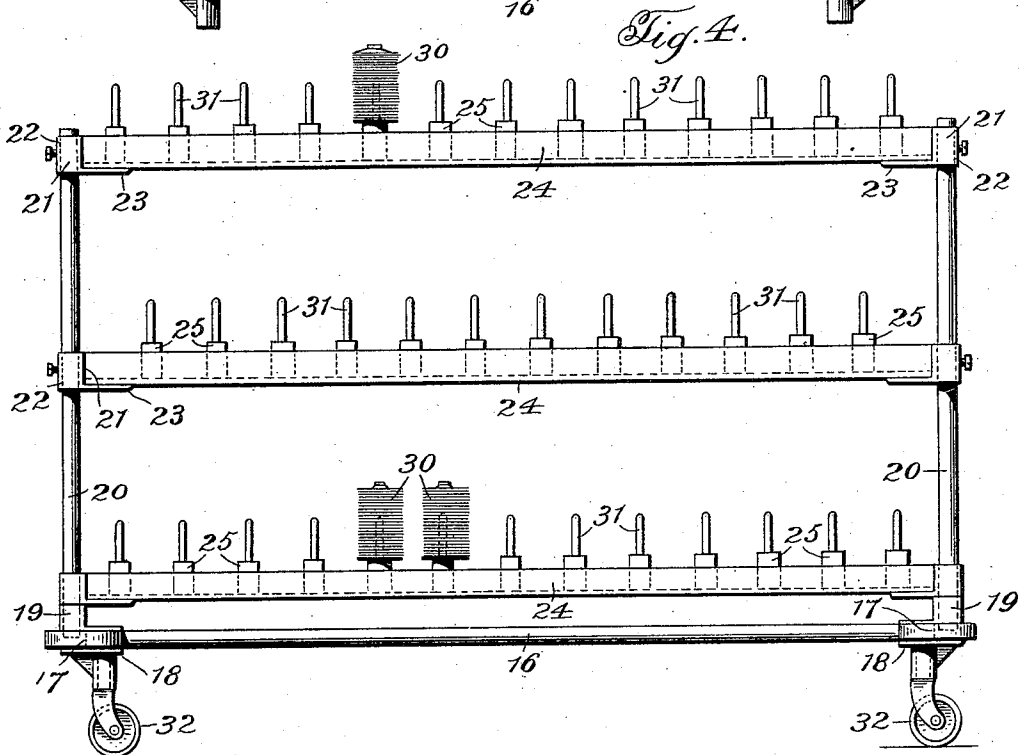
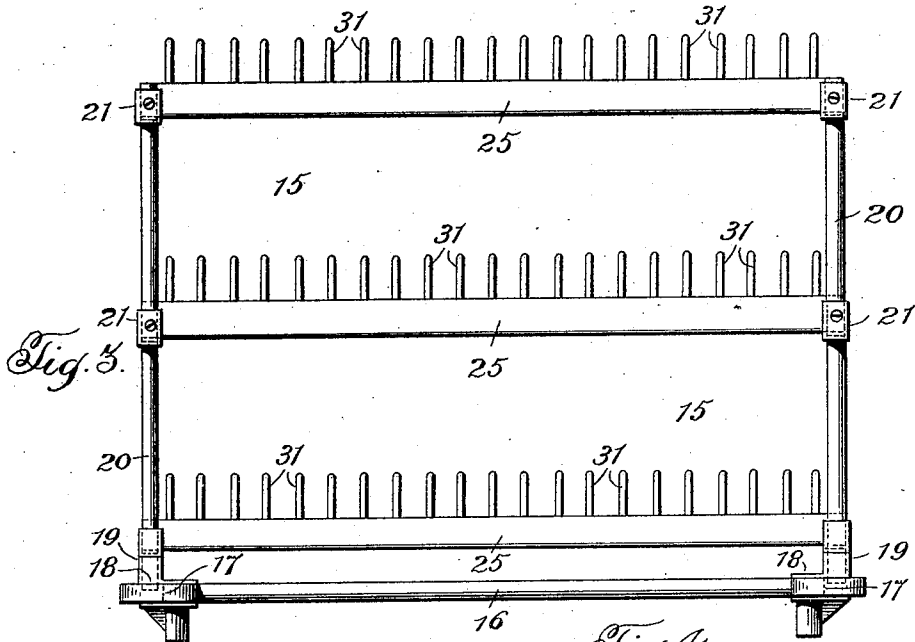
Thomas Allsop & Walter W. Sibson
By J. A. Connelley Attorney:

T. ALLSOP & W. W. SIBSON.
MACHINE FOR DRYING YARN.
APPLICATION FILED DEC. 4, 1907.

934,127.

Patented Sept. 14, 1909.

3 SHEETS—SHEET 2.



Witnesses:

Jas. Hutchinson.
M. C. Tucker.

Inventors
Thomas Allsop and Walter W. Sibson
By *[Signature]* Attorney:

T. ALLSOP & W. W. SIBSON.
MACHINE FOR DRYING YARN.
APPLICATION FILED DEC. 4, 1907.

934,127.

Patented Sept. 14, 1909
3 SHEETS—SHEET 3.

Fig. 5.

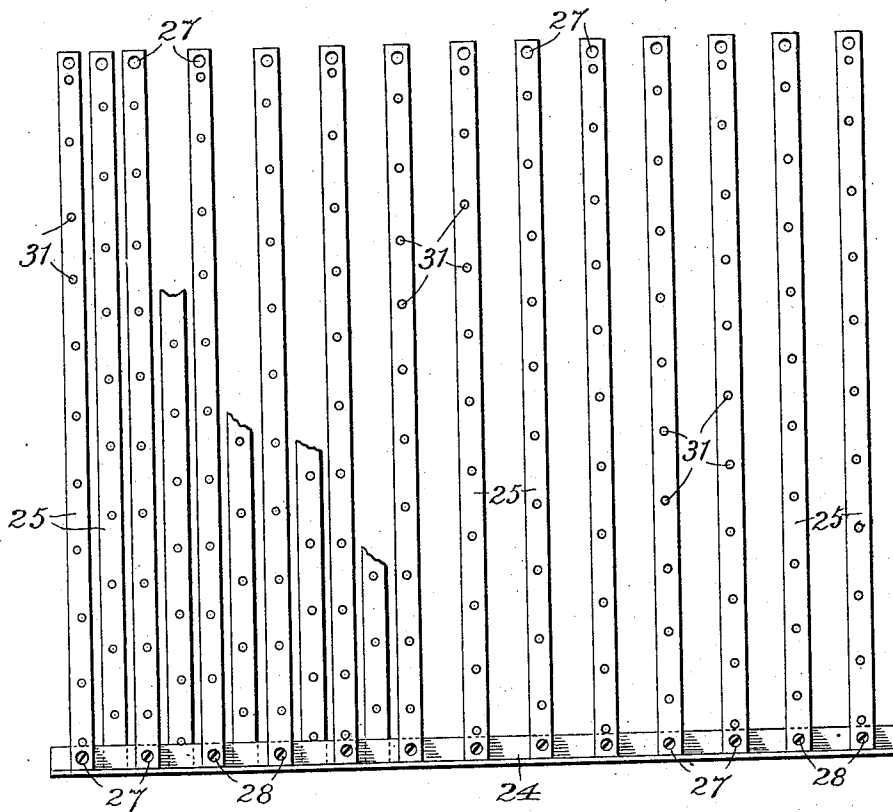
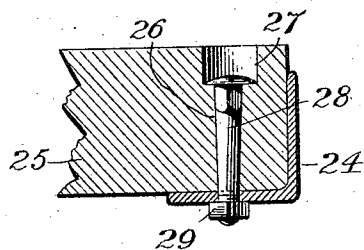


Fig. 6.



Witnesses:
Jas. Hutchinson
M. C. Tucker.

Inventors
Thomas Allsop and Walter W. Sibson
By *A. A. Cronin* Attorney:

UNITED STATES PATENT OFFICE.

THOMAS ALLSOP AND WALTER W. SIBSON, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNORS TO THE PHILADELPHIA DRYING MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR DRYING YARN.

934,127.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed December 4, 1907. Serial No. 405,044.

To all whom it may concern:

Be it known that we, THOMAS ALLSOP and WALTER W. SIBSON, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Drying Yarn; and we 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.

This invention relates to improvements in machines for drying yarn, and more particularly relates to machines for drying yarn wound in conical form.

As practiced at the present time in the dyeing of yarn, the latter is wound in cone form prior to treatment by the dye, in contradistinction to dyeing the same in hanks, as has usually obtained, and these cones are bodily subjected to the dye liquor to impregnate the yarn therewith. By reason of the fact that the layers of yarn approximate two inches, more or less, in thickness it is most difficult to properly dry the cones, and when dyed in delicate colors there is more or less danger of the colors fading or varying in different parts of the cones, especially if the outside layer of yarn must be baked for a great length of time in order to obtain dry yarn at the inside of the cone.

To provide a machine by which conically-wound yarn may be uniformly dried throughout the entire thickness of the cones, without causing the yarn either to fade, or vary in color in parts of the cones, by reason of the drying operation, is the object of the present invention, to which end the invention contemplates the provision of a machine embodying in its construction simple and efficient means for properly supporting the cones during the drying operation, whereby the drying medium may freely circulate about the cones, acting upon each to the fullest measure, and serving to effectually dry out the yarn from the center of the cone to the exterior thereof without in the least varying the shade or the color thereof.

The invention further contemplates the provision of a machine designed to operate with the highest degree of economy, and so constructed as to accommodate a maximum

number of cones for simultaneous treatment without impairing the condition of any individual cone, or causing the uniform treatment of the mass to be affected or varied.

Having these general objects in view, and others that will appear as the nature of the improvements is better understood, the invention consists substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is an end elevation of a drying machine constructed in accordance with, and embodying the principles of, the present invention. Fig. 2 is a transverse sectional view thereof. Fig. 3 is a side elevation of the rack for supporting the cones during the drying operation. Fig. 4 is an end elevation thereof. Fig. 5 is a top plan view illustrating the relative arrangement of the pin rails of the supporting rack. Fig. 6 is a detail sectional view taken through one end of one of the pin rails, and illustrating the manner of connecting the same with the rail support.

Referring in detail to the drawings, the numeral 1 designates the casing or housing of the machine. This casing or housing is formed of any desired material suited to the purpose, and the interior thereof is divided into a drying chamber 2 and a heating chamber 3, a partition 4 that extends longitudinally of the casing or housing 1 effecting this division.

Within the heating chamber 3 is a bank of heating coils 5, which coils are preferably fed with steam as the heating medium, and to the accomplishment of this end an inlet 6 is connected to the top of the coils, which inlet may be connected to any suitable steam main, the lower end of the coils being provided with a drip 7 for leading from the coils water of condensation. The coils 5 are preferably arranged in the lower end of the heating chamber 3, and in order to permit convenient access to the interior of the latter doors 8 and 9 are provided.

Arranged at the upper part of the partition 4 is an opening 9, wherein a rotary fan 10 is located, and said fan is arranged to blow into the upper portion of the drying chamber 2, as will presently appear. The fan 10 is carried by a shaft 11 that extends

transversely of the upper portion of the casing or housing 1, and the roof of the latter that extends over the drying chamber 2 is in the form of an inclined deck 12, which deck serves as a deflector to direct the blast of the fan 10 downwardly into the drying chamber 2. It will be observed that the ends of the shaft 11 project at the exterior of the casing 1, said ends being journaled in suitable bearings 13, a driving pulley 14 being carried by the shaft 11 for the application of power thereto from any suitable source. By arranging the bearings 13 at the exterior of the casing or housing 1 it will be seen that these bearings are not subjected to the action of the drying medium within the casing, so that heating of the bearings is reduced to a minimum, and likewise fire from such cause is also prevented. Moreover, by employing the inclined deck 12 it is possible to use a much shorter shaft, and from a constructional standpoint this is of decided advantage in that it prevents the fan from "chattering" when running at a high speed, and gives to the fan shaft a firm and steady support.

In order to properly support the cones of yarn within the casing or housing 1 during the drying operation a rack 15 is employed, and by referring to Figs. 3 to 6, inclusive, the construction of this rack will be clearly seen. This includes a rectangular structure formed of a series of base rails 16, preferably in the form of pipes, the ends of the base rails 16 being received by sockets 17 formed in corner brackets 18, the sockets 17 of each bracket extending at substantially right angles to each other in order to permit the base rails occupying the position referred to. Each of the corner brackets 18 also has a vertically-extending socket 19 in which is arranged a vertically-extending standard 20, and said standards 20 and the base rails 16 are removably held within the respective sockets of the corner brackets 18 through the medium of set-screws or their equivalent. On each of the standards 20 is arranged a plurality of adjustable brackets 21, each of said brackets being provided with an eye 22, whereby the bracket is capable of sliding upon the standard, and projecting at right angles to each of the eyes 22 is an attaching lip 23. The lips 23 of the brackets at each end of the rack project inwardly, and connected to said lips are supporting rails 24, said rails being in the form of angle irons. To the supporting rails 24 are connected the ends of a plurality of pin rails 25, each of said rails having a bore 26 the upper end of which is enlarged to provide a socket 27, which sockets receive the heads of fastening bolts 28 that fit the bores 26 and engage the lower flanges of the rails 24, being secured in the latter by nuts 29.

The rails 25 are spaced sufficiently from

each other to freely carry the cones of yarn, designated by the numeral 30, and in order that these cones may be held upon the rails each of the latter is provided with a series of upwardly-extending pins 31, the pins of each rail being arranged opposite the spaces between the pins of the immediately contiguous rails, so that throughout the entire series of the pin rails the pins thereof bear a staggered relation to each other.

By arranging a series of the bearing brackets 21 upon each of the standards 20 it will be seen that the pin rails constitute a series of shelves, and by referring to Fig. 4 it will be noted that the rails of each shelf are arranged immediately below the spaces between the rails of the shelf immediately above, thus enabling the drying medium as it is forced upon the cones of the respective shelves to freely act upon the same.

The brackets 21 are held in position upon the standards 20 by set screws or their equivalent, and it is quite obvious that the number of shelves carried by the standards may be varied in accordance with the height of the cones to be dried, the shelves being added to or taken from the standards, and thereby varying the capacity of the rack. The latter is preferably mounted upon caster wheels 32 to facilitate the introduction of the rack to and from the drying chamber, but it is obvious that if desired the rack may form a permanent part of the drying chamber. The latter is also provided with doors 33 to permit insertion and removal of the rack to and from the drying chamber.

In the operation of the hereindescribed machine a cone of yarn is placed upon each of the pins 31, prior to the introduction of the rack to the casing 1. The respective pins being thus provided with the yarn to be dried, the rack is passed into the drying chamber 2, and the doors 33 thereof being closed, and the fan 10 being in operation, it will be seen that the air heated by the coils 5 is forced by the fan 10 from the heating chamber into the top of the drying chamber, where it impinges against the inclined deck 12, and is forced by the latter in a downward direction upon the cones carried by the rack. These being separated from each other by reason of the staggered relation of the pins 31, the heated air freely circulates in and between the cones, acting upon the latter to effectually dry the wet yarn, and serving not only to relieve the outer layers of moisture, but entering to the very core of each cone, and effectually drying the cones throughout their entire area. The air being circulated in the manner described reenters the heating chamber 3, there being suitable communication between the heating and drying chambers, and here it again becomes raised in temperature by contact with the bank of coils 5. The cones are subjected to

the drying action of the air until relieved entirely of the moisture carried thereby, whereupon the rack is removed from the casing, and a second rack, loaded with the wet cones, is introduced to the drying chamber.

By the employment of the hereindescribed machine it is possible to effectually dry the cones without in the least affecting the shade or varying the color of the yarn, and the same readily accommodates a large number of cones for simultaneous treatment without impairing the condition of any individual cone, or causing the uniform treatment of the mass to be affected or varied.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and provided with vertically-extending standards, brackets arranged upon said standards, supporting rails connected to said brackets and extending transversely of the rack, pin rails carried by said supports, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation.

2. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and provided with vertically-extending standards, brackets arranged upon said standards, angle-irons connected to said brackets and extending transversely of the rack, pin rails carried by said angle-irons and extending longitudinally of the rack, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation.

3. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and provided with vertically-extending standards, brackets arranged upon said standards and each provided with an attaching lip, angle irons connected to the attaching lips of said brackets and extending transversely of the rack, pin rails carried by said angle irons and extending longitudinally of the rack, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation.

4. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing

and provided with vertically-extending standards, brackets arranged upon said standards and each provided with an attaching lip, angle irons connected to the attaching lips of said brackets and extending transversely of the rack, pin rails carried by said angle irons and extending longitudinally of the rack, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation, the pins of each pin rail being arranged opposite to the spaces between the pins of the contiguous rails to position the pins of the rack in staggered relation.

5. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and provided with vertically-extending standards, a plurality of brackets arranged upon each of said standards and each provided with an attaching lip, angle irons connected to the attaching lips of said brackets and extending transversely of the rack, pin rails carried by said angle irons and arranged in tiers, said rails extending longitudinally of the rack, the rails of each tier being opposite the spaces between the rails of the contiguous tiers, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation.

6. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and provided with vertically-extending standards, a plurality of brackets adjustably mounted upon each of said standards and each provided with an inwardly extending attaching lip, angle-irons connected to the attaching lips of said brackets and extending transversely of the rack, pin rails carried by said angle-irons and arranged in tiers, said rails extending longitudinally of the rack, the rails of each tier being opposite the spaces between the rails of the contiguous tiers, and a plurality of pins carried by the pin rails for supporting bodies of yarn in separated relation, the pins of each pin rail being arranged opposite to the spaces between the pins of the contiguous rails to position the pins of the rails in staggered relation.

7. In a machine of the class described, the combination with a casing provided with heating and drying chambers, and means for causing a circulation of a drying medium therein, of a rack associated with said casing and having vertically-extending standards arranged at its ends, a bracket arranged upon each of said standards, a supporting rail connected to the brackets of the standards at each end of the rack and extending

transversely of the latter, pin rails carried
by said supporting rails and extending lon-
gitudinally of the rack, and a plurality of
pins carried by the pin rails for supporting
5 bodies of yarn in separated relation.

8. In a machine of the class described, the
combination with a casing provided with
heating and drying chambers, and means for
causing a circulation of a drying medium
10 therein, of a rack associated with said casing
and having vertically-extending standards
arranged at its ends, a bracket arranged
upon each of said standards and provided
with an inwardly-extending attaching lip, a
15 supporting rail connected to the attaching

lips of the brackets of the standards at each
end of the rack and extending transversely
of the latter, pin rails carried by said sup-
porting rails and extending longitudinally
of the rack, and a plurality of pins carried
20 by the pin rails for supporting bodies of
yarn in separated relation.

In testimony whereof we affix our signa-
tures, in the presence of two witnesses.

THOMAS ALLSOP.
WALTER W. SIBSON.

Witnesses:

RALPH M. ERWIN,
HARRY L. FENTON.