O. H. CILLEY.

YARN CONDITIONING MACHINE.

APPLICATION FILED MAR. 24, 1913.

1,092,976. Patented Apr. 14, 1914.

Fig. 1.

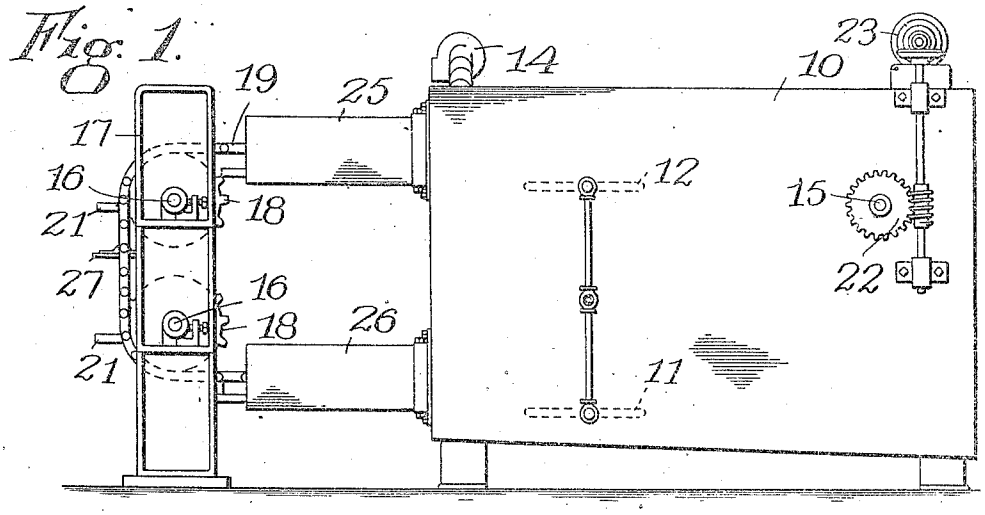


Fig. 2.

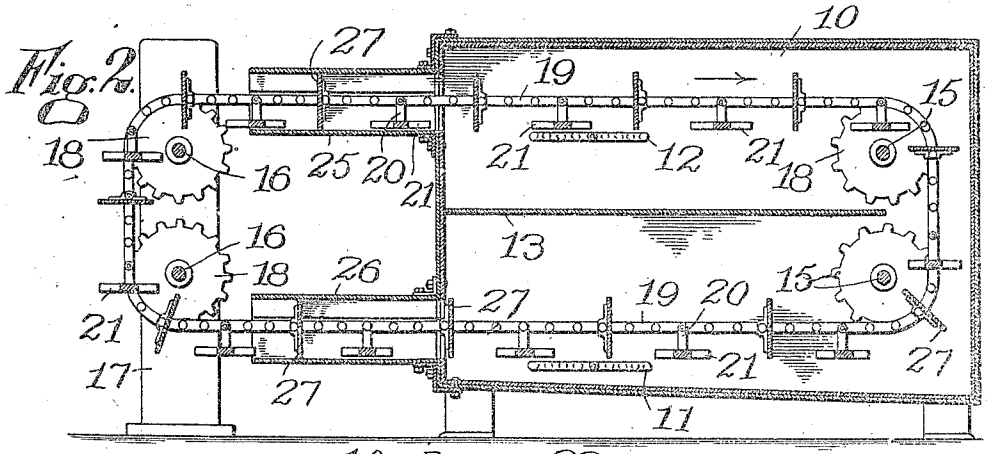
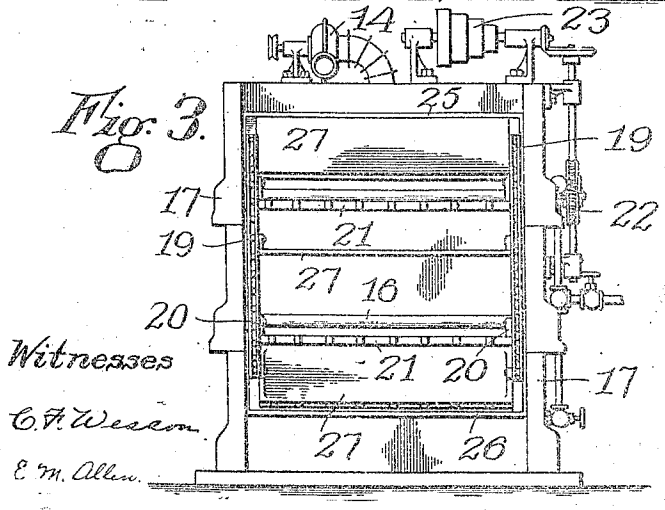


Fig. 3.



Witnesses

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YARN-CONDITIONING MACHINE.

1,092,976. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed March 24, 1913. Serial No. 756,401.

To all whom it may concern:

Be it known that I, OSBORN H. CILLEY, a citizen of the United States, residing at Westford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Yarn-Conditioning Machine, of which the following is a specification.

This invention relates to a machine for conditioning yarns for setting the twist therein in order that they may be used subsequently without difficulty either in weaving or knitting.

As is well known, it is necessary that most yarn used for textile purposes shall have moisture or heat of some form applied to set the twist and thus overcome the tendency to kink when being used in a loom or on a knitting machine. If it is not done there is liability of imperfections appearing in the finished goods in the form of kinks.

Ths invention is designed principally for use in conditioning mule spun yarn, commonly known as "cop" yarn and for conditioning it in the filling boxes, but it is capable of general use and I do not wish to be limited to this particular object.

The principal objects of this invention are to provide a construction by which the conditioning can be accomplished by means of steam in the spinning room and in a thorough and uniform manner without danger of permitting any material amount of steam to escape into the room and without unnecessary handling and conveying of the filling boxes.

The invention also involves an improved form of steam chamber for this purpose adapted to be manufactured and sold in such a way as to be put up in any desired position in a mill, a conveyer therefor suitable for receiving the filling boxes and conveying them through the steam laden atmosphere of the device, and means whereby these filling boxes can be placed on the conveyer outside the machine and conveyed into the machine and through it without permitting the steam to be discharged into the room.

The invention also involves improvements in details of construction and combinations of parts as will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a side elevation of a yarn conditioning machine constructed in accordance with this invention; Fig. 2 is a longitudinal central sectional view of the same; and Fig. 3 is an end view of the machine.

A number of methods have been employed in mills for setting the twist in mule spun yarn but the one in most common use is the steam chest. As is well known, it is most practical not to remove the yarn from the filling boxes into which it is doffed from the mules until it is ready to be put into the looms or knitting machines. Consequently the yarn to be conditioned is left in the filling boxes without being disturbed. On this account the steam chest is not capable of uniformly conditioning the yarn. These boxes have to be piled up in the steam chest and the steam turned on and left in that condition for some hours. In this way the yarn nearest that part of the chest where the steam enters often is more conditioned than is necessary, while that in a remote position is not conditioned sufficiently and it is sometimes found that the yarn subjected to the most prolonged and efficient steaming is discolored. Moreover, on account of the length of time necessary to obtain the desired results by the steam chest method, filling boxes deteriorate very rapidly and often the pitch runs out of the sides of the boxes and ruins the yarn. Other serious difficulties are the length of time required and the annoyance arising by the variation in the temperature which often results in the cracking open of the walls and ceilings of the steam chest thus allowing the steam to escape into other parts of the mill. Also, the steam chest usually has to be built outside the spinning room and thus time is lost in carrying the filling boxes to and from the steam chest. In order to overcome these difficulties and especially to secure a uniform and rapid conditioning of the yarn a steam chamber 10 is provided preferably built entirely of metal. The inside is lined with copper and the outside is covered with sheet steel with asbestos insulation between the two surfaces to prevent radiation in the preferred form of the apparatus. This chamber is shown as of a rectangular form with a slanting bottom and provided with steam inlets 11 and 12 and with a central horizontal partition 13 extending part way from the front to the rear. A fan 14 is shown for drawing out the steam after it has had the desired effect upon the yarn.

The chamber is shown as provided with two shafts 15 inside, one above the other. Two similar shafts 16 are provided outside, parallel with them and supported on uprights 17 which are spaced from the end of the casing. Each of these shafts is provided with a pair of sprocket wheels 18 and on these sprocket wheels run a pair of chains 19 constituting an endless conveyer. These chains are provided with depending pivoted brackets or carriers 20 which support plates 21 at intervals on the chain for carrying the filling boxes. One of the shafts 15 is provided with gearing 22 connected with a pulley 23 by which power is transmitted to that shaft for the purpose of running the endless chain conveyer 19.

The conveyer enters the chamber at the top of one end through a projecting inlet 25 and emerges from the chamber at the bottom through a similar outlet 26. These are long enough and deep enough to receive two of the supports 21 with the filling boxes thereon. For the purpose of preventing the discharge of steam through the inlet 25 the endless conveyer is provided with a regularly spaced series of baffle plates 27 substantially filling the inlet 25 and outlet 26 and sealing them at all times against the exhaust of steam therethrough. These baffle plates extend substantially equal distances above and below the conveyer and are spaced apart a distance equal to the distance of two of the supports 21 and a distance slightly less than the length of the inlet 25. It is to be observed that the steam inlets 11 and 12 are located just under the two strands of the endless conveyer, or rather just under the line of movement of the bottom of the supports 21 on which the perforated filling boxes are carried.

In operation, the yarn on cops is doffed into the filling boxes in the usual way. These are then placed on the supports 21 as these supports come around in proper position, the machine operating continuously. They then pass up and into the inlet 25, as indicated most clearly in Fig. 2, and as soon as the baffle plate 27, which is in advance of each filling box, enters the main chamber steam from the inlet 12 comes directly in contact with the filling box and enters it through the perforations therein. Thus the filling box is inclosed in a space filled with steam. As the fan 14 is directly over the point at which the filling box enters the chamber, it will be seen that the current of steam is caused to pass through and over the filling box immediately upon its entering the chamber. Thus the boxes pass along over the inlet 12 where they get the direct effect of the entering steam, and down into the lower part of the chamber where they pass over the other inlet 11. The current of steam from the inlet 11 has no tendency to pass out through the outlet 26, but it passes backward in the chamber under the partition 13, around the filling boxes, which are approaching this part of the chamber, up through the space at the rear of the partition 13 and then along the filling boxes to the fan 14. Therefore, the effect is to get fresh live steam into intimate contact with the filling immediately upon its entering the chamber, then to keep the filling moving along in a current of steam moving in the opposite direction throughout the travel of the filling in the chamber, and finally to subject the filling to a discharge of live steam just before it passes out of the chamber. The travel of the filling along the chamber of course is comparatively slow but it is found in practice that the yarn is conditioned in a fraction of the time which has been found necessary by other methods, particularly the steam chest method, and there is a corresponding saving in labor on account of the fact that the operative simply places the boxes on the conveyer at the entrance and takes them off at the same place.

There is no necessity of cooling down the temperature to permit the operative to enter it for each charge, and there is no necessity of leaving one charge in the chamber longer than another or of having any portion of the yarn treated more fully than any other portion. Each box of yarn receives the same amount of vapor and on account of the fact that the steam is blown directly into the yarn from the inlet pipes and drawn directly through it by the fan, the yarn at the center is conditioned as well as that on the top and bottom. On account of the rapidity and efficiency of the conditioning operation, the boxes are in the machine for a period of from eight to fourteen minutes only, at the end of which time they pass out of the machine. Because of the rapidity with which the yarn is conditioned and the short period of time that the boxes are in the machine the possibility of the sap running out of the wood into the yarn is eliminated to a great extent and the life of the boxes is materially lengthened.

The use of baffle plates in connection with the fan prevents the steam escaping into the room, which is a great advantage as compared with the old methods of steaming, as it never was possible to provide a steam chest with a door that would not allow a certain amount of steam to escape into the room when being opened and closed. Another great advantage of this invention is that the machine can be, and usually is, located in the spinning room itself whereas with the old steam chest it was necessary to locate the steam chest in the basement of the mill so that any drip or condensed steam from the floor would not leak into any room below. Placing the device in the spinning

room, is an extremely convenient arrangement and saves labor and time. Also, the facts that this process is a continuous one and that the yarn enters and leaves the machine at the same point so that it can be operated entirely by one man, renders this procedure economical.

Although I have illustrated and described only a single embodiment of the invention, I am aware of the fact that many modifications can be made therein without departing from the scope of the invention as expressed in the claim. Therefore I do not wish to be limited to all the details of construction herein shown and described, but

What I do claim is:—

A yarn conditioning machine having in combination a moistening chamber having projecting tubular inlet and outlet members, an endless conveyer supported and actuated to pass in through the inlet member and out through the outlet member, a plurality of depending carriers pivotally connected to said conveyer and adapted to support boxes of filling yarn, and a baffle plate secured to said conveyer between each two carriers and extending substantially equal distances above and below said conveyer when in operative position, said plates closely fitting said tubular members and providing clearance for the suspended carrier when on either side of the conveyer.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

OSBORN H. CILLEY.

Witnesses:
FRED W. SWAIN,
FRANK COLLINS.