

March 26, 1940.

W. CARTER

2,195,357

METHOD AND APPARATUS FOR SINGEING YARN

Filed Oct. 18, 1937

Fig. 1

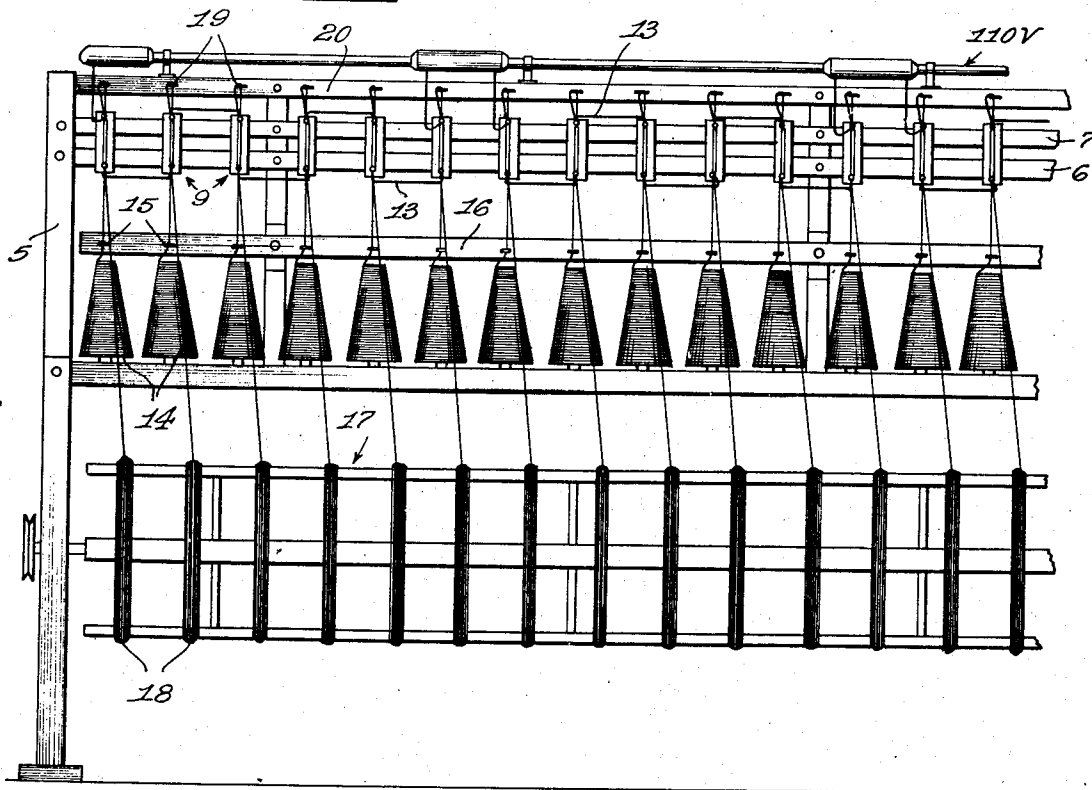


Fig. 2

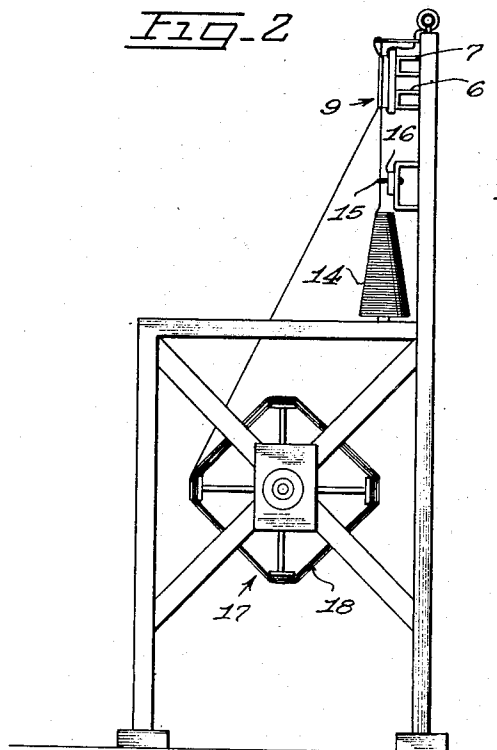


Fig. 4

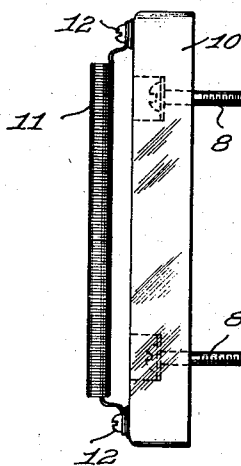
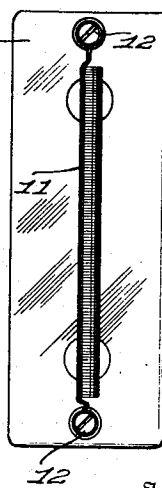


Fig. 3



Inventor

William Carter

Nathaniel R. French

By

Attorney

UNITED STATES PATENT OFFICE

2,195,357

METHOD AND APPARATUS FOR SINGEING YARN

William Carter, New Bedford, Mass.

Application October 18, 1937, Serial No. 169,716

5 Claims. (Cl. 28—63)

This invention relates to method and apparatus for singeing yarn or thread, and more particularly to methods and apparatus for that purpose of the class wherein the singeing element is electrically heated.

One of the principal objects of the invention is to provide means whereby the singeing operation may be performed in conjunction with other necessary processes in the preparation of yarn, thus saving the labor and time required by the usual singeing operation separate in itself.

Another object is to perform the singeing operation by means of a series of electrically heated elements through which the yarn is passed, and whereby the yarn is completely and evenly singed over its entire surface.

One of the principal advantages of this invention is that the singeing operation is performed while the yarn is being reeled off bobbins into skeins. This reeling operation is one of the customary steps in the preparation of yarn for commercial use, and the apparatus of the invention is so constructed and arranged that the singeing is accomplished at the same time as the reeling, and that it requires only the small amount of extra time necessary for threading the series of singeing elements.

Another feature of the invention is that the yarn singed by the herein-described process is completely and evenly cleared of nap, thus insuring against the danger of unevenness in the subsequent dyeing and finishing operations.

Other objects and advantages will appear from what follows.

One embodiment of the invention will now be described, as a non-limiting example, in connection with the accompanying drawing, in which—

Figure 1 is an elevational view, somewhat diagrammatic, of a portion of a reeler equipped with singeing elements of this invention;

Figure 2 is a similar end view of the reeler of Fig. 1; and

Figures 3 and 4 are detail views on a larger scale than that of Figs. 1 and 2, of an individual singeing element.

On the supporting frame 5 of the reeler are mounted angle irons 6 and 7, to which are bolted by means of bolts 8 the individual singeing elements 9, shown in detail in Figs. 3 and 4. Element 9 comprises a holder 10 of porcelain or similar insulating material, and a heating member 11 mounted on holder 10 by means of screws 12. Member 11 is preferably a coil of Nichrome wire such as is commonly used for electric heaters, etc., and a convenient size thereof has been found

to be $\frac{3}{8}$ inch in diameter. The number of elements 9 depends upon the number of bobbins 14 carried by the reeler, one singeing element being used for each bobbin. The average reeler will carry forty-eight singeing elements, and it has been found convenient and advantageous in practice to join them electrically by means of wires 13 in sets of six in series, the several sets being connected in parallel across a 110 volt circuit, but other hook-ups may be used if desired.

In threading the apparatus for the operation of simultaneously singeing and reeling the yarn, its end is led off bobbin 14 and threaded through the corresponding eye 15 on bar 16. A sufficient length of yarn to form a loop is then drawn off the bobbin and, by means of a long and slender hook, this loop is drawn upward through the heating coil 11. It is then looped over the corresponding eye-hook 19. Eye-hooks 19 are attached to a horizontal bar 20. Thus the yarn 20 passes upward and then downward through said coil. Its end is then led to the reel 17 and is attached thereto in the usual manner. This is the preferred procedure with yarns of ordinary sizes. Very fine yarns need be threaded only once through the heating coil 11.

When all of elements 9 have been threaded, the electric current and reel are simultaneously put into operation. The speed of reel 17 is governed, by conventional means such as cone pulleys, according to the size of the yarn; the lighter the yarn, the higher the speed. Since the speed-regulating apparatus forms no part of the invention, it has not been illustrated. As soon as all the yarn has been reeled, the current and power are shut off. This is important for the reason that it effects substantial economy in cost of power, for no current need be used except when the yarn is actually being singed.

Obviously, several feet of yarn from each bobbin will pass through its coil 11 before the latter is sufficiently heated to singe it. However, since the coils heat almost instantaneously, this unsinged amount is very small. Moreover, by means of a bunch builder, provision may be made to separate this small length of yarn and use it for the leasing strings. No provision is needed for caring for the breaking of yarn during the singeing operation, it having been found that when using this invention breakage occurs so infrequently that such provision is unnecessary. Should a yarn break, it is merely rethreaded and run through with the next batch of bobbins, and no inconvenience results.

The yarn produced by the above described proc-

- ess has a distinctive appearance in color and texture, whereby it is readily distinguishable from other yarns now obtainable made from domestic cotton. Its color is a decided ecru, similar to (though distinguishable from) the tint of high grade Egyptian cotton. Yarn of that tint is in much demand for the fabrication of various widely used articles, especially those made by knitting and crocheting. Moreover, in yarns produced by the above described process this very desirable ecru tint is of uniform shade over the entire surface of the yarn, due to the fact that said tint is the result of uniform exposure of the entire circumference of the yarn to uniform heat while moving at uniform speed.
- Furthermore the said color is permanent. It will withstand washing with soap and water and can be changed only by bleaching, dyeing, or like treatment.
- The yarn of this invention is further characterized by uniformity of texture over its entire surface. It lends itself readily to mercerization, and when mercerized has a notably lustrous appearance.
- The yarn produced by the process and product herein described, is not claimed herein. In deference to an official requirement it has been made the subject of a divisional application, filed June 21, 1939, Serial Number 280,422.
- What is claimed is:
1. The method of singeing yarn which comprises causing the same to pass in both directions simultaneously through a coil electrically heated to redness at a speed sufficiently high to prevent the yarn from burning.
 2. Apparatus for singeing yarn comprising: a reeler; a plurality of singeing members each com-

prising a holder of insulating material mounted on said reeler and a coil capable of being electrically heated to redness; means for guiding said yarn from the bobbins to the reeler through said coils; and a source of electric power.

3. The method of singeing yarn which comprises the steps of causing the yarn to pass at a determined speed through a tubular singeing member of electrically conductive material open only at its ends and which is adapted to form part of an electric power circuit, and heating said members to incandescence by passing an electric current therethrough, whereby the yarn is exposed uniformly over its entire surface to the direct singeing action of said member while passing through the same.

4. The method of electrically singeing yarn which comprises the steps of threading the yarn through an electrical resistance member of tubular form open only at its ends and exposed exteriorly to the atmosphere, causing an electric current to pass through said member thereby heating it to incandescence, and causing the yarn to pass through said member at a determined speed thereby exposing it uniformly over its entire surface to the singeing action of said member while passing through the same.

5. Apparatus for singeing yarn comprising a plurality of singeing members consisting each of a resistance element of tubular form capable of being electrically heated to incandescence, and yarn-feeding means for causing a plurality of yarns to pass each through one of said singeing members, whereby each yarn is exposed uniformly over its entire surface to the incandescence of the singeing member while passing through it.

WILLIAM CARTER.