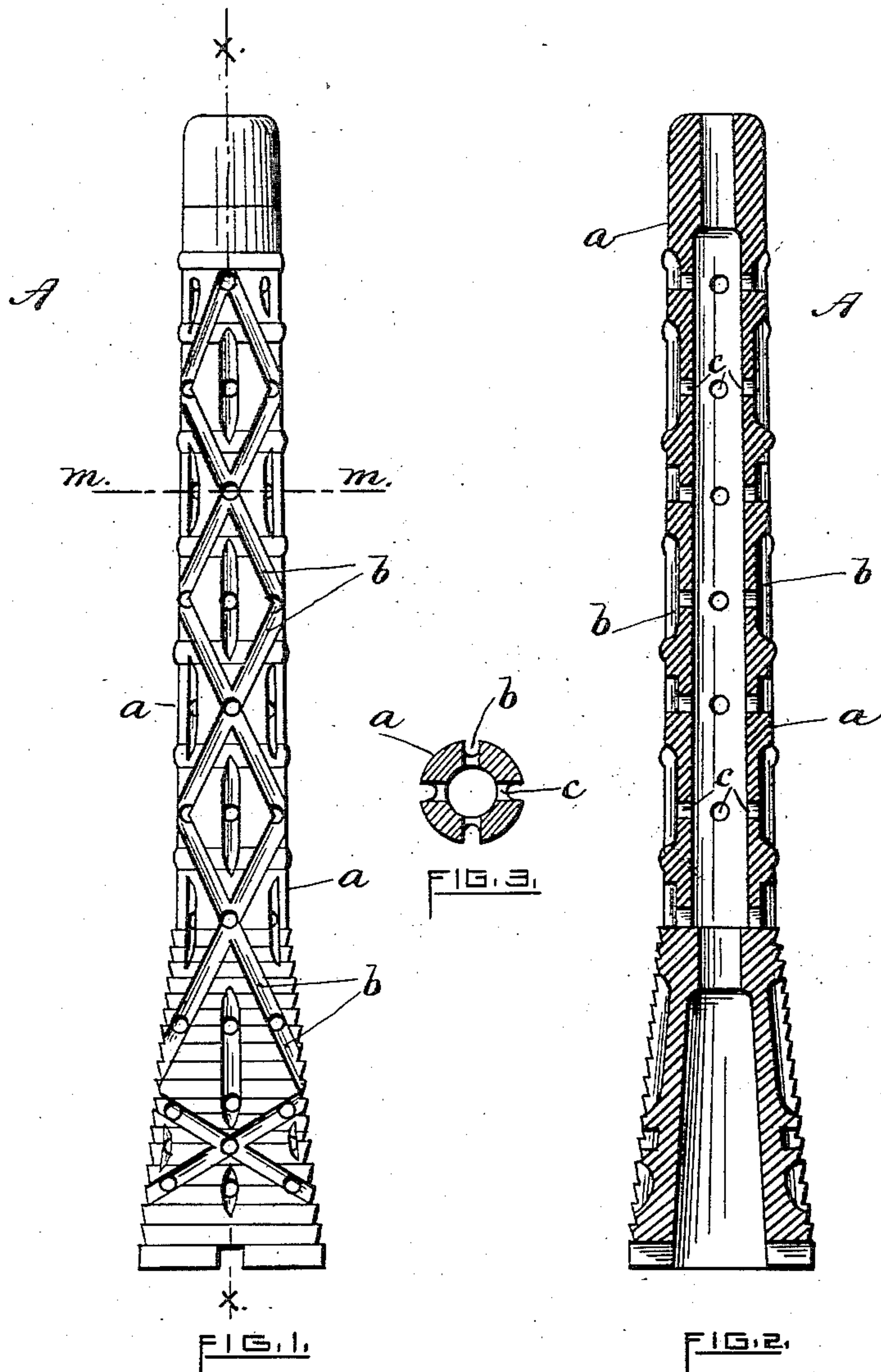


(Model.)

S. D. KEENE.
BOBBIN.

No. 465,045.

Patented Dec. 15, 1891.



WITNESSES.

Charles Hannigan.
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UNITED STATES PATENT OFFICE.

SAMUEL D. KEENE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF THREE-FOURTHS, BY DIRECT AND MESNE ASSIGNMENTS, TO HERBERT N. FENNER, OF SAME PLACE, EDWARD G. BLODGETT AND EDMUND W. ORSWELL, OF PAWTUCKET, RHODE ISLAND, AND THE HOLYOKE MACHINE COMPANY, OF HOLYOKE, MASSACHUSETTS.

BOBBIN.

SPECIFICATION forming part of Letters Patent No. 465,045, dated December 15, 1891.

Application filed August 23, 1889. Renewed March 12, 1891. Serial No. 384,719. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL D. KEENE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Bobbins; and I 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to hollow bobbins or quills employed for holding yarn during the process of manufacturing textile products; and it consists, essentially, in a hollow bobbin adapted for use in loom-shuttles having in its exterior surface diagonally-disposed intersecting grooves, and having holes extending transversely through the shell and communicating with the grooves.

Usually heretofore in the process of dyeing yarn or in bleaching it the practice has been to unwind it from the bobbins and form it into skeins—"skeining it," as it is termed—which skeins are then subjected to the various operations necessary to produce the desired color. When the yarn has been thus treated and dried, it is rewound upon bobbins, it then being ready to be placed in a shuttle of a loom.

An objection to the skeining of the yarn preparatory to the dyeing operation is that it materially increases the cost of the manufactured product, not only by reason of the time consumed in the operation, but also by producing an increased percentage of waste yarn.

In order to obviate or at least greatly reduce the expense incident to the bleaching, dyeing, or coloring of yarn by such former method, it has been proposed heretofore to wind the unbleached or uncolored yarn upon perforated grooved bobbins, which are next immersed in or subjected to the dyeing liquid, the latter, by means of a suitable pump, being caused to pass through the perforations of the bobbin

and throughout the mass of yarn wound thereon, the grooves affording ducts for the passage of the coloring-matter and causing it to engage and permeate the entire interior portion of the yarn lying adjacent to the barrel of the bobbin, the mass of liquid lying outside, at the same time affecting the exterior of the wound yarn. Now upon establishing a circulation of the liquid it will pass through the yarn and bobbins and after a short time completely color it. After removing the bobbins or cops of yarn from the action of the dyeing-liquid and drying them they may be placed in a shuttle and used in a loom, &c., as usual.

The object of my invention is to provide an improved bobbin intended for use in the latter method of preparing the yarn, and which shall be so constructed as to hold the load of yarn wound thereon well in place and prevent the knocking off of such load after the filled bobbin has been placed in the shuttle of a loom, and while the shuttle is being thrown from side to side in the loom.

My improved bobbins when filled with yarn may be very advantageously employed in mills where the yarn is steamed before being woven into cloth. In order to prevent the coloring-matter, &c., from penetrating the wooden bobbin or spool, I prefer to have the surface of them enameled both within and without.

It will be seen that by reason of the grooves formed in the surface of the yarn-retaining portion of the bobbins there will be produced a series of small channels, along which the coloring-liquid, steam, bleaching-chemicals, &c., may flow to more readily engage the interior portion of the yarn and permeate it than would be the case if the yarn were wound upon a bobbin having a smooth surface, or even one provided with holes only, and having the grooves omitted, and also that the intersecting diagonal arrangement of the grooves, which in practice will be secured by forming opposite spiral grooves around the bobbin, provides for the passage of the bleaching or dyeing liquid to all parts

of the interior of the yarn-load upon the bobbin and the thorough permeation of the yarn-load, more completely distributing the liquid to the yarn, and at the same time such
 5 grooves provide a holding means whereby the mass of yarn upon the bobbin is prevented from moving endwise upon the latter under the influence of the shocks occurring during the operation of the shuttle. This
 10 holding of the yarn in place is highly important, as will of course be understood by those skilled in the art of weaving. In the case of bobbins intended to be used in loom-shuttles and to have the yarn which is wound thereon
 15 bleached or dyed while still held thereby, it becomes doubly necessary to provide means for preventing the yarn-load from slipping endwise, inasmuch as during the treatment of the yarn the latter, as a result of being first
 20 wetted and then dried, becomes stretched, so that the coils thereof no longer clasp the exterior surface of the bobbin as closely as when first wound thereon.

In the appended drawings, Figure 1 is a
 25 side elevation of a bobbin provided with my improvement. Fig. 2 is a central longitudinal sectional view taken on line *x x* of Fig. 1, and Fig. 3 is a transverse sectional view taken on line *m m* of Fig. 1.

30 In the drawings, A designates my improved bobbin or spool as a whole and as made of wood or other suitable material. In some cases I find it desirable to make the yarn-retaining portion or barrel of metal, as tin,
 35 copper, &c. In any event the bobbins are hollow—that is to say, they are provided with a central longitudinal hole extending up into or entirely through them, thereby adapting the bobbins to be mounted on a spindle, as
 40 usual.

The exterior surface of the barrel portion *a* of the bobbin has formed therein a series of shallow grooves *b*. These grooves extend longitudinally of the bobbin in the form of
 45 spirals. As drawn, the spirals are oppositely

arranged and intersect each other at intervals. I sometimes further provide the bobbin with a series of short grooves arranged parallel with the bobbin's axis, as shown. The spiral grooves act to effectually retain
 50 the yarn-load in position upon the bobbin.

The barrel *a* of the bobbin is further provided with small holes *c*, cut transversely through the shell at convenient intervals and communicating with the grooves, as clearly
 55 represented. When thus grooved and perforated, the yarn-load is uniformly acted upon by the liquids during the bleaching or dyeing process.

By covering the entire surface with enamel
 60 the bobbin is preserved from the action of steam, &c., during the treatment of the yarn-load, thereby preventing the bobbin from splitting, warping, or checking.

In the drawings the grooves are represented
 65 as terminating intermediate of the ends of the bobbin. It is, however, not essential that such limitation be strictly carried out, as it is obvious that the grooves may extend to the extreme ends without departing from the
 70 spirit of my invention.

I claim as my invention—

1. A hollow bobbin adapted for use in loom-shuttles, having in its exterior surface diagonally-disposed intersecting grooves, and having
 75 holes extending transversely through the shell and communicating with the grooves.

2. An enameled hollow bobbin adapted for use in loom-shuttles, having in its exterior surface diagonally - disposed intersecting
 80 grooves, and having holes extending transversely through the shell and communicating with the grooves.

In testimony whereof I have affixed my signature in presence of two witnesses.

SAMUEL D. KEENE.

Witnesses:

CHARLES HANNIGAN,
 GEO. H. REMINGTON.