

(No Model.)

E. HUBBARD.
SPOOL.

No. 501,513.

Patented July 18, 1893.

Fig. 1.

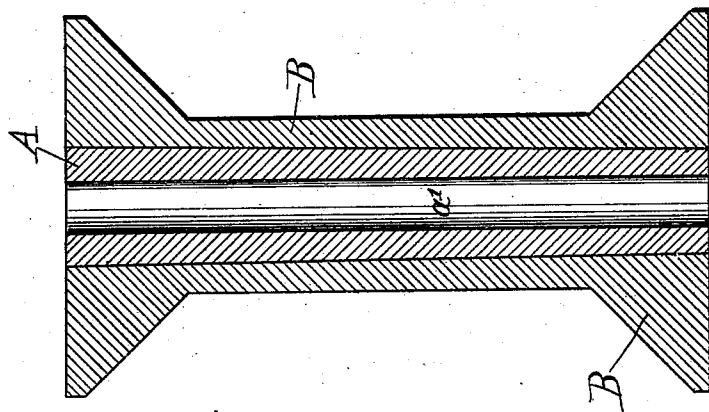


Fig. 2.

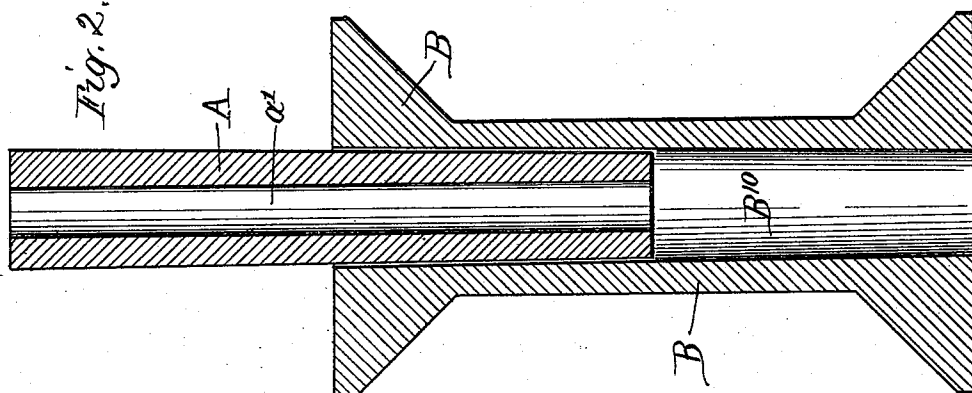
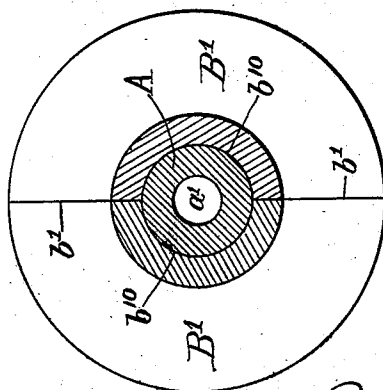


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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SPOOL.

SPECIFICATION forming part of Letters Patent No. 501,513, dated July 18, 1893.

Application filed February 13, 1893. Serial No. 462,028. (No model.)

To all whom it may concern:

Be it known that I, EBER HUBBARD, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Spools, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

In the drawings,—Figure 1 is an axial section through a spool embodying my invention. Fig. 2 is a view showing the outer portion of the spool body in axial section, and the core or shaft in section, partly inserted, the representation being of a preferred form of my invention. Fig. 3 is a transverse section of a modified form.

The purpose of this invention is to provide an improved spool or bobbin especially adapted for winding thread in such quantities as constitute convenient sized spools for manufacturers' use. These spools are commonly used to hold from one-half pound to a pound of thread, and are required to be not only very accurate in their construction, so that they may be adapted to operate in the mechanism by which the spools are wound, but also to possess great strength, because the strain put upon them in winding the thread on them is sufficient to rupture any weakly constructed spool. They must also be adapted to resist the action of moisture,—that is, neither to warp nor swell to any appreciable extent. Hitherto, such spools have been made practically only of natural wood, and in order to make them of such material and adapt them perfectly to the requirements of their use, the wood has to be very carefully prepared and the spools made in a number of pieces very accurately and securely joined. Many attempts have been made to produce spools for this purpose from fibrous pulp, but, so far as I am aware, these attempts have hitherto failed on account of various difficulties which either prevent accuracy in the outline and proportions, or prevent strength sufficient to endure the strain of winding.

In my improved spool, I aim to overcome the former defects and produce a spool made chiefly of fibrous pulp, and which, on that account, shall be much cheaper and somewhat

lighter than the natural wood spools hitherto in use.

My invention consists in making the exterior portion of the spool, both of the heads and of the shaft, of fibrous pulp, (reduced to the requisite form by any of the known methods by which such pulp may be manipulated, but preferably by molding the pulp, and afterward suitably drying, and, if desired, indurating the same;) the interior or core of the spool extending entirely through from end to end,—constituting the center, therefore, both of the heads and of the shaft,—being made of natural wood. This natural wood core is glued to the exterior molded fiber body over the entire exterior surface of the core and interior surface of the body, which, for that purpose, it will be understood, is formed with an axial cavity extending through it adapted to receive the core. It is a comparatively easy matter to mold fibrous pulp about a natural wood core, so that there would be produced a spool having a natural wood core and a fibrous pulp exterior, but such a spool would be useless for the purposes for which my invention is designed, because the core would fail to adhere permanently to the pulp molded about it, and whatever devices might be resorted to to prevent it actually escaping from the exterior envelope of molded fiber, it would remain loose within such a fiber body, and would make a spool, not only too inaccurate to co-operate with winding mechanism, but also too little strengthened by the natural wood to endure the strain put upon it. The result sought, therefore, requires practically that the core should be glued to the enveloping fiber. Such a spool may be produced in at least two forms, both of which I have illustrated in the drawings, wherein—

A represents the natural wood core, and B, the exterior body, which is shown in Fig. 3 as made in two parts, B' B' which may be separately molded and longitudinally grooved and matched at the diametrical faces b' , the grooves b'' in each being semi-cylindrical, so that when matched together they constitute a cylindrical cavity into which the core A fits, and in which it may be glued, while at the same time, the two halves are glued together upon their matched diametrical faces.

A practical form of spool may be thus produced, but the process would be slower and somewhat more expensive than the process which will produce the spool which I prefer, which is illustrated in Figs. 1 and 2, wherein the fibrous exterior body B is molded integrally with an axial aperture B¹⁰ (corresponding to the aperture made up of the two grooves b¹⁰ b¹⁰ in Fig. 3), said aperture being tapered slightly from one end to the other, and the core A being correspondingly tapered. The same taper is represented in the form shown in Fig. 3, but is not vitally essential in that form, whereas, it is the distinguishing characteristic of the form shown in Figs. 1 and 2. Having produced the exterior fibrous body and the interior natural wood core, if the axial aperture through the body were strictly cylindrical and the natural wood core were of the same form and were made to fit accurately the axial bore as would be necessary in order to adapt the two to be united to form a reliable spool, it would be impossible to insert the core into the aperture of the body, and at the same time secure the two together by glue, because glue being applied either within the aperture of the body or upon the surface of the core, would be entirely scraped off by the longitudinal insertion of the core into the body, and by the time the former were accurately seated in the latter, practically dry surfaces of each would be in contact, and the slightest shrinking of the wooden core, or the slightest enlargement of the fibrous exterior, would destroy the efficiency of the spool, if, indeed, it would even at the start have any practical efficiency, which is doubt-

ful, because the spool is necessarily driven by a spindle which takes into the central aperture a' of the core, the resistance to the driving being the strain of the thread at the circumference of the spool, so that unless the core and body were retained together otherwise than by the mere friction of the one upon the other at their contacting surfaces, the core would slip within the body and fail to drive the latter to wind the thread upon it. It will be seen, therefore, that the taper of the core and of its seat within the body, as an expedient for securely gluing the one to the other, is essential to this form of my invention.

I claim—

1. A spool having a central core of natural wood extending throughout its length, and having an exterior portion of fibrous pulp also extending the entire length and glued to the core: substantially as set forth.

2. A spool having its outer portion made of fibrous pulp suitably hardened, and having an axial cavity tapering from end to end, combined with a central core of natural wood correspondingly tapered and occupying the cavity, and glued to the outer portion at the tapering surfaces in contact: substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 12th day of January, 1893.

EBER HUBBARD.

Witnesses:

CHAS. S. BURTON,
JEAN ELLIOTT.