No. 704,584. Patented July 15, 1902.

R. SCHOFIELD.

SKEWER FOR BOBBINS.

(Application filed Oct. 25, 1901.)

(No Model.)

Fig. 1.

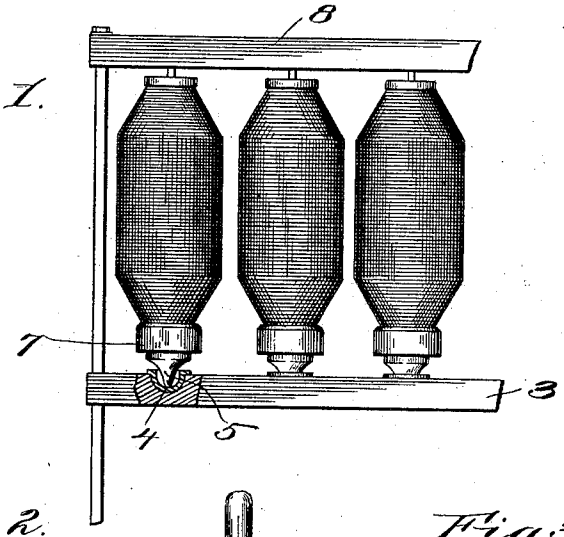


Fig. 2.

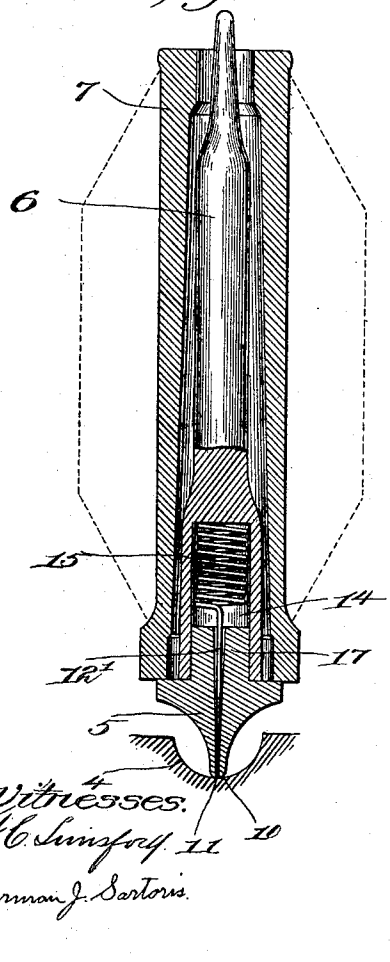


Fig. 4.

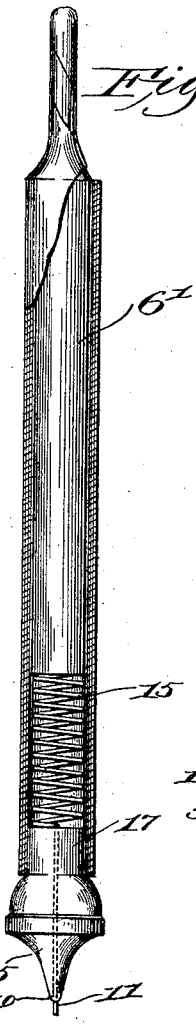
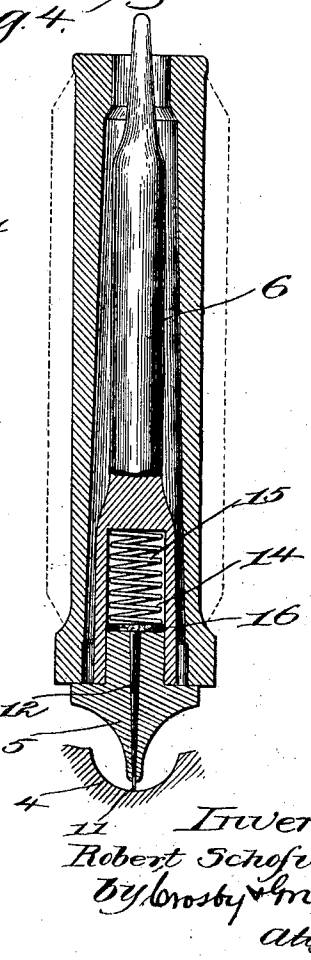


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT SCHOFIELD, OF NEW BEDFORD, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO CHARLES BURGESS, OF NEW BEDFORD, MASSACHUSETTS.

SKEWER FOR BOBBINS.

SPECIFICATION forming part of Letters Patent No. 704,584, dated July 15, 1902.

Application filed October 25, 1901. Serial No. 79,924. (No model.)

To all whom it may concern:

Be it known that I, ROBERT SCHOFIELD, a citizen of the United States, residing at New Bedford, in the county of Bristol and State of Massachusetts, have invented an Improvement in Skewers for Bobbins, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to skewers such as are used to support and hold bobbins, and it has special reference to the skewers for supporting bobbins containing roving, which bobbins are used in various forms of spinning machinery.

In that type of spinning and similar machinery wherein the bobbins containing the roving from which the yarn is spun are supported in creels one form of device used in supporting and holding the bobbins is in the nature of a skewer or spindle over which the bobbin is slipped, the said skewer having at its lower end a tip, which rests in a step or cup bearing, generally of glass, porcelain, or similar material, the upper end of the skewer being received in any suitable centering device in the creel to maintain the vertical position of the bobbin. These skewers are commonly made of wood; but it has been found in practice that as the roving is withdrawn from the bobbin during the process of spinning and the bobbin and its skewer or spindle are rotated in the creel the friction of the wooden tip against the cup or step bearing is such that when the bobbin is nearly empty the strain upon the roving necessary to turn the bobbin and skewer is sufficient, so that said roving frequently breaks, this being so because as the bobbin decreases in size the effective lever-arm through which the tension on the roving acts to turn the bobbin decreases, while the friction of the wooden tip against the step remains practically constant. To overcome this, it has been attempted to supply the skewers or spindles with a tip of metal or some other material having a less coefficient of friction than wood; but practice has demonstrated that while such a tip is of advantage when the bobbin is nearly empty, yet when the bobbin is full the friction between the tip and the step-bearing which receives it is not sufficient to hold the bobbin steady, since the lever-arm through which the tension on the roving operates to turn the bobbin is at its maximum and a slight pull on the roving will tend to cause the bobbin to overrun. For the perfect operation of skewers of this nature it is necessary, therefore, that when the bobbin is full and the lever-arm through which the roving operates to rotate the bobbin is at its maximum a tip should be used having a greater coefficient of friction than when the bobbin is nearly empty and the lever-arm of the force tending to rotate the bobbin is correspondingly small. Consequently I have in this invention employed a skewer having a tip provided with two bearing-surfaces of different coefficients of friction, and means are provided which are controlled by the weight or amount of material upon the bobbin to determine which bearing-surface shall be brought into operative contact with the step or cup bearing, the construction being such that when the bobbin is filled the bearing-surface on the tip having the greater coefficient of friction is in engagement with the cup or step bearing, while when the bobbin is partially empty the bearing-surface having the smaller coefficient of friction is brought into operative contact with the step. By this construction a sufficient friction between the tip and the step is created when the bobbin is full to act as a brake to steady the action of the bobbin, while when the bobbin is empty a sufficiently small friction is generated between the tip and step-bearing so as to allow of the bobbin turning sufficiently easy to prevent the roving from becoming broken.

Figure 1 shows a portion of a creel supporting bobbins. Fig. 2 is a partial sectional view of one form of skewer or spindle, the full bobbin being shown in section thereon. Fig. 3 is a similar view of a modified form of skewer, the bobbin being shown as partially empty; and Fig. 4 shows still another form of skewer.

I have not herein illustrated any particular form of spinning, roving, or slubbing frames

in connection with which I intend to use my improved skewer, but have only shown in Fig. 1 a portion of one ordinary form of creel in which the bobbins are supported. The creel comprises the usual base-rail 3, having the cups or sockets 4 of some suitable material, such as glass or porcelain, which cups form steps for the lower or tip end 5 of the skewer 6, which supports the bobbin 7 on which the roving is wound, the upper end of the skewer being supported in any suitable or usual centering device (not shown) in the upper rail 8. As usual, the skewers are supported in their bearings so as to turn freely, so that the roving may be readily withdrawn from the bobbins, and in order to cause the friction between the tip 5 and the step or cup bearing 4 to vary according to the size of the bobbin I preferably provide the tip with two bearing-surfaces having different coefficients of friction, either one of which may be brought into operative contact with the step or cup 4, and thus receive the weight of the bobbin and skewer, and I provide means whereby the bearing-surface having the greater coefficient of friction is made operative when the bobbin is full, while that having less coefficient of friction supports the weight of the bobbin when the bobbin is nearly empty. While various ways of accomplishing this may be employed, yet I have chosen in this embodiment of my invention to illustrate the tip with the annular bearing-surface 10, of wood or some material having a comparatively large coefficient of friction, the said annular bearing-surface surrounding a central bearing-surface 11, having a comparatively small coefficient of friction, and means are provided for bringing either bearing-surface into operative position to support the bobbin. Preferably I construct the bobbin with the usual tip 5, of wood or some similar material having a comparatively large coefficient of friction, and provide the said tip with a central bore, in which is received a pin 12, the end 11 of which is adapted to project through the point of the tip 5, as seen in Figs. 3 and 4. Suitable means are provided acting against the pin 12 tending normally to project the same beyond the point of the tip 5, the said means acting with a force which is less than the weight of the full bobbin, but greater than the weight of a nearly-empty bobbin, whereby when the bobbin is full the force of the said means is overcome and the wooden tip 5 rests against the bearing 4, while when the bobbin is partially or nearly empty the said force of the said means acting against the pin overcomes the weight of the bobbin and forces the metallic bearing-point 11 into contact with the bearing 4. As illustrated, the skewer is made with an interior chamber 14, in which is received a suitable coiled spring 15, the said spring acting against the inner end of the pin 12 with a force which is less than the weight of a filled bobbin, but greater than that of a partially-empty bobbin.

As illustrated in Fig. 3, the pin 12 is slightly tapering and is received in a tapering aperture in the tip 5, the end of the pin bearing against a disk 16, against which the spring 15 also abuts, or the said disk 16 may be made integral with the pin 12, if desired.

In the form of invention illustrated in Figs. 2 and 4 the spring 15 and the pin 12′ are integral with each other, the lower end of the material forming the spring 15 being bent, as shown, to project through the aperture in the tip 5.

The operation of the device will be clearly apparent from the drawings, and, assuming that the spring 15 is of such a tension as to balance the weight of the skewer and the bobbin when the bobbin is about one-half filled with roving, it will be seen that when the bobbin is full, as illustrated in dotted line, Fig. 2, the tension of the spring will be overcome by the combined weight of the bobbin, skewer, and roving, and the wooden bearing-surface 10 will be brought into contact with the step-bearing 4, thus causing sufficient friction between the wooden bearing-surface 10 and the said step to cause the bobbin to run steadily, while when the bobbin is about half empty the tension of the spring 15 will overcome the combined weight of the bobbin and skewer and raise the same off from the cup-bearing 4 and force the pin 12 downwardly, so that the weight of the bobbin will be supported upon the metallic bearing-surface 11. The friction between the tip and the cup 4 will thereby be decreased to correspond with the decreased size of the bobbin, whereby the tension to which the roving is subjected in turning the bobbin will be lessened and the roving will be prevented from breaking.

In the form of my invention illustrated in Fig. 3 the taper of the pin 12 operates to prevent said pin from falling out of the tip portion 5, while in the form shown in Figs. 2 and 4 the spring 15 serves to limit the outward movement of said pin.

As a convenient way of constructing the skewer 6 to provide the chamber 14 I may make the said skewer in two parts—the body portion 6, having the chamber 14 therein, and the tip portion 5 being provided with the shank 17, which fits into the open end of the chamber 14—the two parts of the skewer being secured together in any suitable way.

Although I have described above a skewer as composed of wood, it will be obvious that my invention would not be departed from if the skewer were made of any other material, and in Fig. 4 I have illustrated a form of skewer in which the body 6′ is made of paper or similar material, while the tip portion 5 may be of wood or any other material having a sufficiently great coefficient of friction. Neither do I desire to limit myself to a skewer having a wooden and a metallic bearing-surface, either one of which may be brought into operative contact with the step-bearing, for it will be obvious that other materials besides

wood and metal may be used, provided the materials have different coefficients of friction, and I therefore desire to claim, broadly, a skewer having at its tip end two bearing-surfaces of different coefficients of friction, either one of which bearing-surfaces may be brought into operative contact with the bearing, determined by the amount of material on the bobbin.

It will be obvious that many changes may be made in the structure of my invention without departing in any way from the spirit of the invention as expressed in the appended claims.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A skewer for bobbins provided at one end with two separate bearing-surfaces having different coefficients of friction, said bearing-surfaces being movable relative to each other, whereby either one may be brought into operative position to support the skewer.

2. A skewer for bobbins provided with two bearing-surfaces having different coefficients of friction, and means governed by the amount of material on the bobbin to determine which bearing-surface shall be brought into operative position.

3. A skewer for bobbins having a body portion and a tip portion adapted to be received in a step or cup bearing, the said tip portion having two bearing-surfaces of different coefficients of friction, and means governed by the amount of material on the bobbin to determine which bearing-surface shall have operative contact with the cup-bearing.

4. A skewer for bobbins having a body portion and a tip portion adapted to rest upon and engage a cup or step bearing, said tip portion being provided with two separate bearing-surfaces having different coefficients of friction.

5. A skewer for bobbins having a body portion and a tip portion adapted to rest upon and engage a cup or step bearing, said tip portion being provided with two separate bearing-surfaces having different coefficients of friction, and means to bring either of said bearing-surfaces into operative contact with the cup-bearing, the construction being such that when the bobbin is full the bearing-surface having the greater coefficient of friction is rendered operative to support the bobbin, while when the bobbin is partially empty the bearing-surface having the less coefficient of friction is brought into operative contact against the cup-bearing.

6. A skewer for bobbins having a tip portion provided with a wooden bearing-surface, and a supplemental metallic bearing-surface, and means governed by the amount of material on the bobbin to determine which bearing-surface the skewer shall rest upon.

7. A skewer for bobbins having a tip portion provided with a central metallic bearing-surface, and an annular wooden bearing-surface surrounding the metallic bearing-surface, and means governed by the amount of material on the bobbin to determine which bearing-surface shall be brought into operative position against the cup or step.

8. A skewer for bobbins having a tip portion adapted to rest in and be supported upon a cup-bearing, said tip portion having a central metallic wooden surface and an annular wooden bearing-surface, and means governed by the amount of material on the bobbin to determine which bearing-surface shall be brought into operative contact against the cup-bearing, the construction being such that when the bobbin is full the skewer is supported upon the wooden bearing-surface, while when the bobbin is partially empty the said skewer is supported on the metallic bearing-surface.

9. A skewer for bobbins having a wooden tip provided with a central bore, a metallic pin in said bore, and means tending normally to cause the pin to project beyond the end of said tip, said means acting with a force which is less than the weight of a full bobbin, the construction being such that the weight of a full bobbin causes the pin to retract and allows the wooden tip to engage the bearing-cup, while the weight of a partially-filled bobbin is overcome by said means and the pin is projected.

10. A skewer or spindle for bobbins having a wooden tip portion provided with a central bore, a metallic pin in said bore, a spring acting against the inner end of said pin and tending normally to force the point thereof beyond the tip with a pressure less than the weight of a filled bobbin, the construction being such that the weight of a filled bobbin compresses the spring and allows the wooden tip to engage the bearing-cup, while when the bobbin is partially empty the spring raises the bobbin and forces the pin outwardly, the said pin supporting the weight of a partially-empty bobbin.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT SCHOFIELD.

Witnesses:
THOMAS KNOTT,
CHARLES BURGESS.