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METHOD OF FORMING QUILLS FOR SHUTTLES

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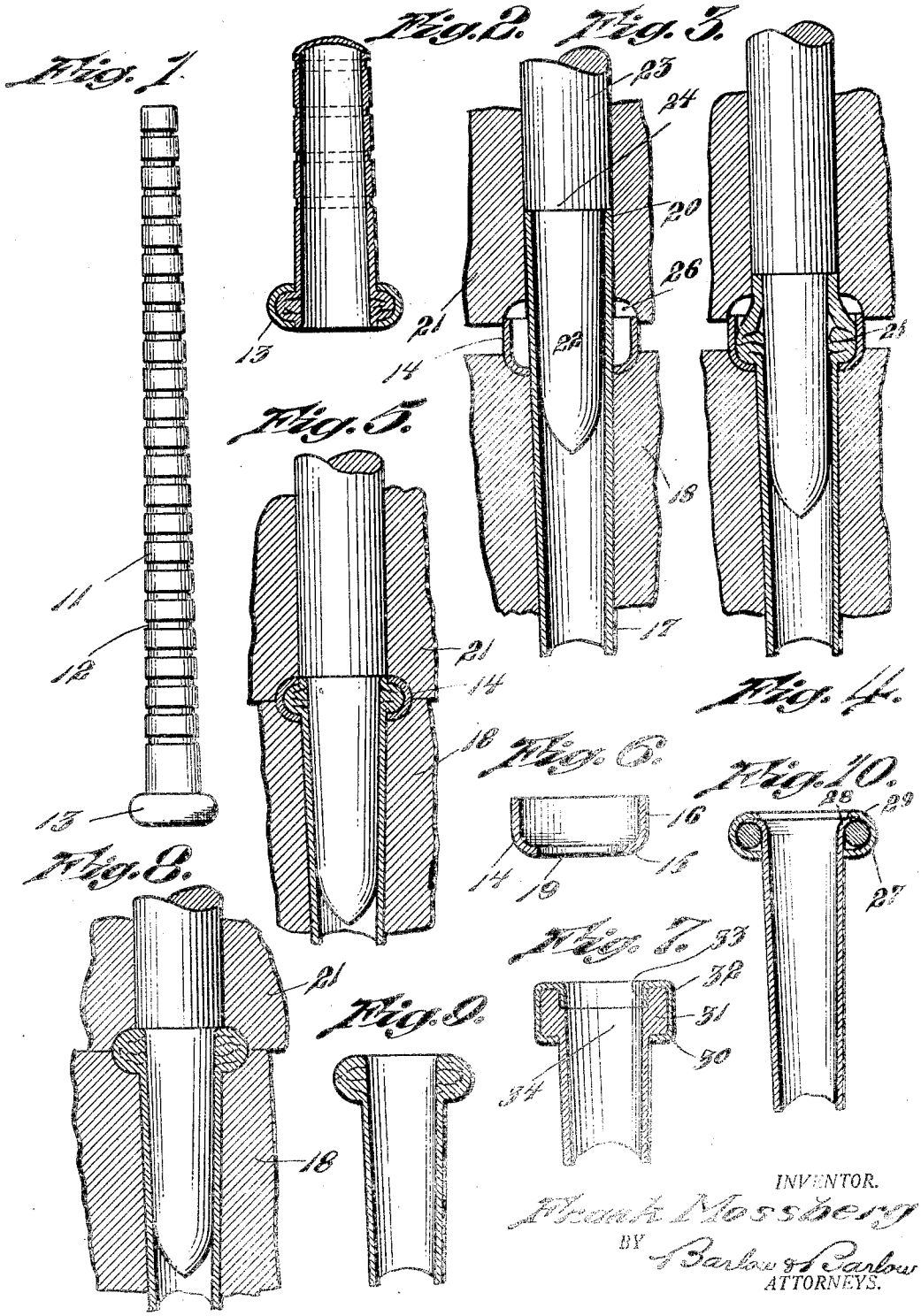

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METHOD OF FORMING QUILLS FOR SHUTTLES

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5 Claims. (Cl. 29—170)

This invention relates to a quill or bobbin for use in a shuttle and has for its object the provision of a sheet metal quill which will have an enlarged base to be gripped by the jaws of the shuttle to hold the same in position.

Another object of the invention is the provision of a base which may be formed by suitably pressing the metal to upset the same.

Another object of the invention is the provision of a base having an outer surface of a material harder than the shank of the quill to greater resist wear of the gripping jaws.

A further object of the invention is the provision of means for retaining the hardened material tightly in position on the quill and suitably folding the same to provide a secure engagement with the quill.

A still further object of the invention is the provision of a quill having a shell at its base of a material harder than that of the body of the quill and a filling material between said shell and quill suitably held in position by folding of the parts.

With these and other objects and advantageous features, the invention consists of a novel arrangement of parts, more fully disclosed in the detailed description following, in conjunction with the accompanying drawing, and more particularly set forth in the appended claims.

Fig. 1 is a side elevation of a quill constructed in accordance with my invention.

Fig. 2 is a sectional view through a fragmental portion thereof.

Fig. 3 shows a pair of dies and a plunger with the tube in a position to receive the first step in upsetting for enlarging the base with a hardened shell thereon.

Fig. 4 is a view similar to Fig. 3 showing a more advanced movement of the plunger and consequent upsetting of the tube.

Fig. 5 is a view similar to Figures 3 and 4 showing the completion of the movement of the plunger and a completion of the movement of the dies.

Fig. 6 is a sectional view of the shell which is illustrated in the figures heretofore mentioned.

Fig. 7 is a modified form of shell for a heavier and larger quill showing the same as further bent and extending into the bore of the quill.

Fig. 8 is a still further modified quill and the dies and plunger for forming the same, the same being formed without the shell illustrated in the figures heretofore mentioned.

Fig. 9 is a view of the quill removed from the dies and showing the finished outer surface as formed by the dies.

Fig. 10 is a still further modified structure showing a quill of sheet metal construction and shell with a separate and independent filling base between the quill and the shell the parts being secured together by suitable folding or bending thereof about the filling material.

In the manufacture of quills for shuttles and the like it is desirable that the same shall be light in weight and that the base be sufficiently strengthened or enlarged to permit of secure gripping thereof by the jaws of the shuttle such as are present in shuttles for automatic looms. And in order to accomplish this object I have provided a metal tapered tube by swaging and upset a portion of this tube to provide an enlarged base which in some instances may be upset into a shell which is folded about the base to secure the same in desired position in which instance a finished outer surface is provided. And in cases where the shell or harder material is not used, dies may be brought together to suitably form the outer surface of the enlarged base to prevent the same from abrading the yarn or the like. And in some instances instead of using the stock of the tube itself for enlarging the base a filling material may be provided between the shell and the tube and suitably held in position for folding the stock of the tube and that of the shell about each other and about the filling material; and the following is a detailed description of the present embodiment of this invention illustrating the preferred means by which these advantageous results may be accomplished.

With reference to the drawing, a complete quill is shown in Fig. 1 having a shank portion 11 generally tapered and provided with corrugations 12 for preventing axial slipping of the package of yarn therefrom. The base portion 13 is enlarged to provide a surface to be gripped by the jaws of the shuttle and is formed as illustrated in Figures 1–6 by positioning a shell 14 of a construction such as shown in Fig. 6 and having bottom 15 and side walls 16 about a tapered tube designated 17 which is positioned in a lower die 18, the opening 19 of the shell closely fitting the tapered tube 17 at a point along the length thereof, spaced from the end 20 of the tube which end portion 20 is located in the upper die 21 and which receives the arbor portion 22 of the plunger 23.

Upon movement of the plunger 23 its shoulder edge 24 forces by cold pressing the end of the tube downwardly to fold and spread as illustrated at 25 in Fig. 4 into the shell through its opened

side and when the plunger reaches the end of its stroke as illustrated in Fig. 5 the upper die 21 moves toward the lower die 18 to cause the curved portion 26 thereof to fold the side 16 of the shell 14 inwardly over a portion of the outer surface of the enlarged base thus formed and upsetting the end portion of the stock of the tube.

In some cases the shell of harder material than the tube may be omitted in which case the dies 18 and 21 as illustrated in Fig. 8 are brought together to finish the outer surface of the upset and enlarged base as shown in Figures 8 and 9.

In still other instances a construction as illustrated in Fig. 10 may be formed in which case a ring of filling material 27 may be positioned in the shell in lieu of upsetting the stock of the tube thereinto and in this instance a plunger of a different form is provided for first folding the outer end portions 28 of the tube over the filling 27 after which the dies fold the top edge 29 of the shell over the edge 28 of the tube to securely lock the shell and tube together about the filling material. In this way the filling material is forced upwardly against the outwardly directed flange 28 and tightly bound in position.

In instances where it is desirable to form larger quills a construction of shell having generally rectangular form as illustrated at 30 in Fig. 7, is provided and after the stock 31 has been forced into the shell 30 its upstanding side edge 32 is forced inwardly and then downwardly as at 33 into the bore 34 of the quill to securely lock it thereon.

It will be further understood that I start with a cylindrical tube of the same diameter throughout its length and by swaging taper the same to the desired degree which swaging operation tends to make the material hard, which is desirable as greater strength is afforded.

The upsetting of the metal by cold pressing eliminates shrinking which occurs where heat is applied and thus eliminates a loose fitting shell and in some cases I may completely upset the metal by cold pressing and put on the shell afterwards by pressing and bending the shell onto the softer metal with a tight fit.

While I have described a quill for a shuttle or the like, this invention applies to any similar bobbin or structure adapted to have an upset enlarged portion.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. The method of forming a shuttle quill from a tapered tube which consists in positioning a shell having bottom and side walls about said tube with the bottom wall spaced from the end of the tube, and then positioning material in said shell and closing the side walls of the shell over the material so positioned therein to form the end of the tube.

2. The method of forming a shuttle quill from a tapered tube which consists in positioning a shell having bottom and side walls about said tube at a point spaced from the end thereof, upsetting the stock of the tube into the shell and closing the side wall of the shell over the stock.

3. The method of forming a shuttle quill from a tube which consists in positioning a shell having bottom and side walls about said tube at a point spaced from the end thereof, upsetting the stock of the tube into the shell and closing the side wall of the shell over the upset stock.

4. The method of forming a shuttle quill from a tapered tube which consists in positioning a shell having bottom and side walls about said tube at a point spaced from the end thereof, upsetting the stock of the tube into the shell and against said bottom wall and closing the side wall of the shell over the stock.

5. The method of forming a shuttle quill from a tapered tube which consists in positioning a shell having bottom and side walls about said tube with the bottom wall spaced from the end of the tube and then positioning material in said shell rolling the tube over said material and the shell over said tube, and closing the mouth of the shell over the material so positioned therein to form the end of the tube.

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