

Feb. 27, 1934.

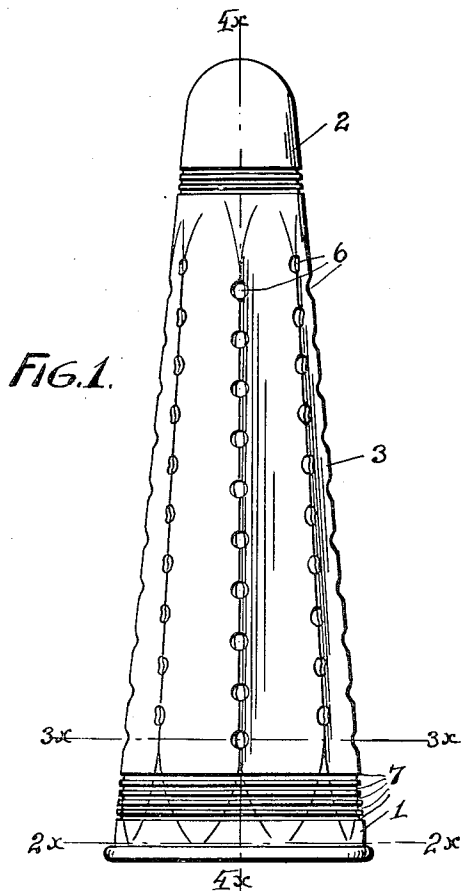
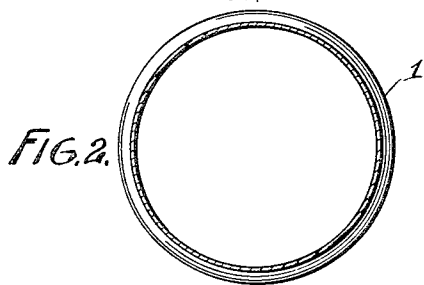
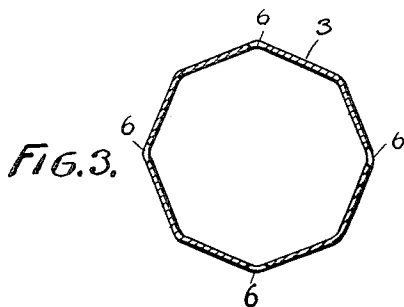
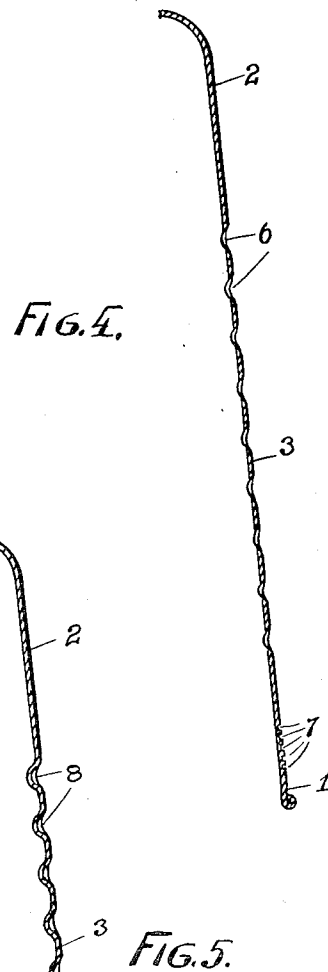
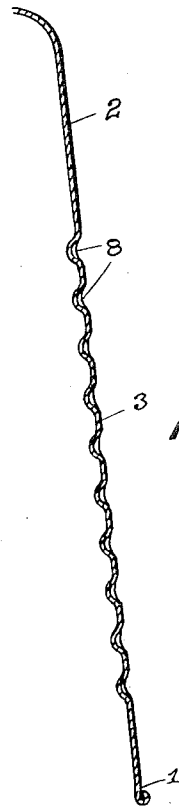
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1,949,291

METAL WINDING BOBBIN

Filed Nov. 10, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

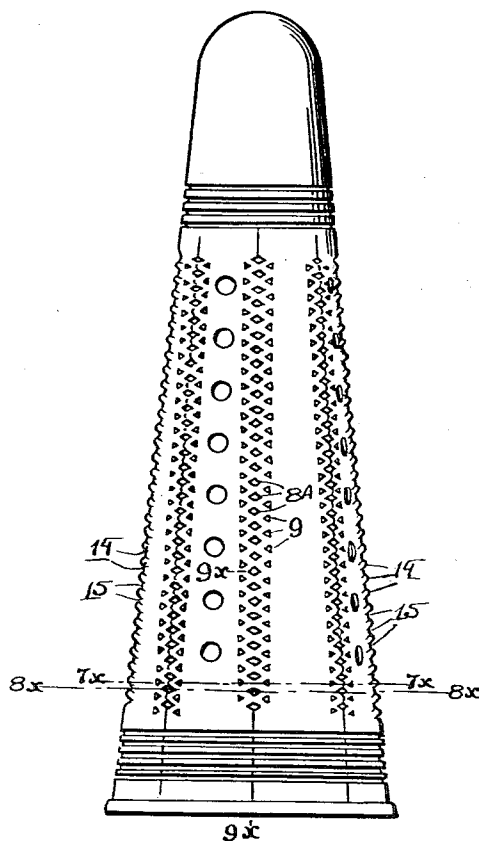


FIG. 6.



FIG. 9.

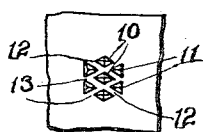


FIG. 10.

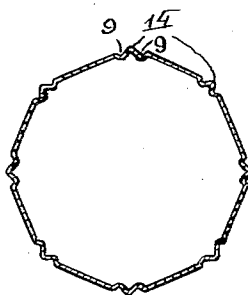


FIG. 7.

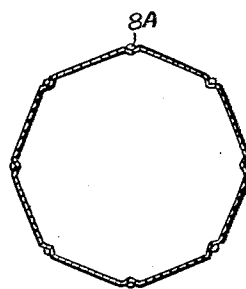


FIG. 8.

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1,949,291

METAL WINDING BOBBIN

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Application November 10, 1930
Serial No. 494,644

11 Claims. (Cl. 242—121)

This invention relates to all metal cones adapted to have wound thereon silk, yarn and the like and the object of this invention is to provide a cone which will be firmly held by the supporting mandrel when placed thereon and may be used over and over again for an indefinite period without any appreciable wear that would cause the cone to slip on the mandrel on the repeated use thereof.

Another object of this invention is to provide the cone with improved external means which cause the silk, yarn and the like to evenly wind up thereon and prevent slipping of the thread down to the last layer on the unwinding therefrom.

Other objects and attendant advantages will be apparent from the detailed description of one embodiment of the invention which follows, reference being had to the accompanying drawings in which

Figure 1 illustrates an elevation of the improved cone.

Figure 2 shows a horizontal sectional view of the cone, the section being taken on the line 2x—2x of Figure 1.

Figure 3 shows a horizontal sectional view of the cone, the section being taken on the line 3x—3x of Figure 1.

Figure 4 shows a vertical sectional view of one side of the shell of the cone, the section being taken on the line 4x—4x of Figure 1.

Figure 5 shows a similar vertical sectional view of a slightly modified form of the shell of the cone.

Figure 6 is a side elevation of a modified form of the metal winding cone.

Figure 7 is a horizontal sectional view of the winding cone illustrated in Figure 6, the section being taken on the line 7x—7x of Figure 1.

Figure 8 is another horizontal sectional view of the winding cone illustrated in Figure 6, the section being taken on the line 8x—8x of Figure 1.

Figure 9 is a vertical sectional view of a portion of the winding cone illustrated in Figure 6, the section being taken on the line 9x—9x of Figure 1.

Figure 10 is a top plan view of a portion of the die which is used to form the holding means on the metal winding cone illustrated in Figure 6.

In the several figures like reference numerals indicate like parts.

The invention illustrated and described is an improvement of the cone illustrated and described in my prior application Serial No. 404,755. The improvement in the construction of

the cone, forming the subject matter of my present invention consists, among other features, in the form of the body of the cone in which it is made up. The cone is drawn into the shape illustrated in Figure 1 from a sheet metal blank with the bottom or base 1 and a short length or section 2 at the upper end of the body of the cone having a circular cross section. The intermediate main body or section 3 of the cone is octagon shaped in cross section in order to have its flat sides yield to the outward pressure of the mandrel on which the cone will be mounted. This mandrel may be either a rigid or an expanding mandrel because in the one case a slight force with which the cone is telescoped over the mandrel will expand the sides of its sufficiently to hold the cone rigid on the mandrel, while in the expanding mandrel the expansion of it will expand the cone resulting in a firm grip of the mandrel on the cone.

The bottom and top of the cone are made circular in cross section in order to present a smooth surface that rotates concentrically with the mandrel wherever the cone is exposed. The circular perimeter of the base of the cone is necessary because the feed finger which feeds the thread onto the cone in the winding of it must be set as close to the surface of the cone as possible at the beginning of the winding operation and an octagon shaped base will not permit this because of the protruding corners thereof. The base of the cone body is therefore slightly contracted and rounded as illustrated in Figures 1 and 2.

To prevent any slipping of the thread while it is wound on the cone or is unwound from it, the edges of the octagon shaped body portion 3 of the cone are perforated with holes 6, 6 which are uniformly spaced along each of the edges. These holes form a shallow depression in the corners of the cone body into which the layers of thread embed themselves side by side as the thread is being wound onto the cone from one end to the other. The walls of the holes 6 are preferably beveled and smoothened so as not to present a rough edge which might injure the fibers of the thread when they come in contact therewith.

Because of the fact that the thread is wound on the cone in a spiral path the holes 6, 6 in consecutive edges of the cone body are offset from each other and this offset is made to correspond to the spiral path in which the thread is being wound so that the thread will pass from one hole 6 in one edge into the offset hole

of the next edge and parallel to this angle over the edges of the cone body between the holes 6, 6. With a portion of the threads thus embedded in the depressions of the edges formed by the holes provided therein, the thread cannot slip off from the cone after being wound up thereon either during the winding or unwinding of the thread.

Near the base 1 the cone body is encircled by a series of five narrow parallel grooves 7, 7 which are equally spaced from each other. These grooves are formed so that a thread entering it will be held in place therein and cannot easily slip out therefrom. For this reason the sides of the grooves are not rounded but are left as square as possible without sharpening the edges to a point where they might injure the fibers of the thread. The grooves 7, 7 are provided near the bottom of the cone body in order to allow the ends of the first layers of the thread to engage therein when the winding operation changes its axial movement for the succeeding layer of thread to be wound on the cone body. The thread, when engaging into these grooves, is thus prevented from slipping near the base of the cone at the beginning of the winding operation of each layer until sufficient thread is wound on the cone so that the layers of thread already wound on the cone will hold succeeding layers of thread from slipping thereon.

The holes 6, 6 also serve as ventilating holes for the thread which is wound onto the cones. These holes are necessary to keep the threads in the proper and uniform humid condition while the thread is being unwound from the cone and fed to the textile machine. The cones are placed into a humidity chest for storage and also while the thread is being unwound from them and the humidity is allowed to permeate thru the layers of thread on the cone thru the holes 6, 6 and keep the thread in the proper uniform condition at all times.

In Figure 5 I have illustrated a slightly modified form of the cone. This modification consists in forming circular pockets or depressions 8, 8 into the edges of the octagon shaped body portion of the cone. These depressions or pockets take the place of the holes 6, 6 in the cone illustrated in Figures 1 to 4. When the pockets 8, 8 are used in place of the holes 6, 6, separate ventilating holes are necessary or the pockets may alternate with the holes in order to provide the proper ventilation for the cone by using part holes and part pockets.

In the modification of the winding cone illustrated in Figures 6 to 10 inclusive an angular formation of ridges and valleys is provided in the corners of the octagon shaped hollow metal body. In Figure 6 this cone is illustrated in elevation with a row of diamond shaped depressions 8A, 8A formed in the edges of the cone and evenly spaced thereon. These diamond shaped depressions are supplemented by smaller triangular depressions 9, 9 on each side of the row of diamond shaped depressions in staggered intermediate relation thereto. Both the full diamond shaped depressions 8A and the triangular depressions 9 are formed in the edges of the cone by a male die, a portion of which is illustrated in plan view in Figure 10. This male die has a series of pyramid shaped projections 10, 10 having a diamond shaped base. On each side of these pyramid shaped projections 10, 10 and in staggered relation thereto are the smaller

pyramid shaped projections 11, 11 having a triangular shaped base.

These pyramidal projections 10 and 11 form between them the angular mutilated channels 12, 12 and 13, 13. The angular direction of these channels from one side to the other of the die past the sides of the pyramidal projections 10, 10 and 11, 11 is that of the angle at which the thread is wound onto the cone and is approximately between 25 and 30 degrees. The die is forced down onto each edge of the cone with the pyramidal projections 10, 10 in line with the edge of the cone in order to form therein the diamond shaped depressions 8A, 8A. The pyramidal projections 11, 11 on each side of the projections 10, 10 of the die at the same time form the triangular depressions 9, 9 along each side of the edges of the cone and the diamond shaped depressions formed therein and all of the projections are forced into the metal so that mutilated angularly extending ridges 14, 14 are formed across the edges of the cone. These mutilated angular ridges in the edges of the cone correspond with the mutilated angular channels 12, 12 and 13, 13 in the die formed between the pyramidal projections 10, 10 and 11, 11 so that the angle at which these mutilated angular ridges pass from one side of the edges of the cone to the other is that of the angle the thread is wound onto the cone. The valleys 15, 15 between the mutilated angular ridges 14, 14 in the edges of the cone thus have the first layers of the thread automatically guided into them when the thread is wound onto the cone and the thread passes from one valley to the other in the successive edges of the cone and embeds itself therein.

As pointed out in the description of the octagon shaped winding cone illustrated in my copending application, the winding cone is placed on a mandrel when the thread is wound up thereon. This mandrel is expanded in order to firmly hold the cone in place thereon during the winding operation. In expanding the mandrel within the octagon shaped cone the flat sides thereof are slightly forced out with the result that the corners or edges between the flat sides are slightly drawn in. In this way the radial distances of the edges of the cone are slightly shortened prior to having the thread wound up thereon. In the cone illustrated in Figure 6 this results in having the depressions 8A, 8A brought closer to the center of the cone before and during the winding operation.

After the thread is wound up on the cone, the cone is removed from the mandrel which, for this purpose, is made to contract to allow the expanded sides of the cone to also contract and assume their normal position. As the previously expanded sides of the cone are allowed to contract the edges between the sides slightly expand to their normal position against the layers of thread which have been wound up thereon. The expansion of the edges of the cone then puts the thread, especially the innermost layers of it, under a tension which holds the layers of thread located in the angular grooves in the edges of the cone firmly embedded therein.

In unwinding the thread from the cone, the cone is held stationary while the thread is being pulled off the cone from a central point above the apex of the cone. All of the thread, even the last layers of it, may thus be pulled off without danger of having the thread come off in layers and feed off the cone faster than each turn unwinds itself from each layer.

While I have shown the mutilated angular valleys formed on a cone having an octagonal cross section it is understood that the same mutilated valleys may be formed on cones having other symmetrical cross sections or even a circular cross section.

I claim:

1. A bobbin formed up of sheet metal and having a hollow polygonal cone shaped body having depressions in the outer edges of said polygonal body with the depressions on one of the edges offset from the depressions in the edges on either side thereof.

2. A bobbin formed up of sheet metal and having a hollow polygonal cone shaped body, a concentric groove encircling said body near the base thereof and means provided on the edges of said body to cooperate with said groove and prevent a slipping of the thread on said body during the winding and unwinding thereof from said body.

3. A bobbin formed up of sheet metal and having a hollow polygonal cone shaped body, concentric parallel grooves encircling said body near the base thereof, and spirally spaced circular depressions in the edges of said polygonal body above said grooves.

4. A bobbin formed up of sheet metal and having a hollow polygonal cone shaped body, spirally spaced circular depressions in the edges of said body, concentric grooves encircling said body below said depressions and a circular base formed at the open end of said body.

5. In a winding cone having angular sides the combination of mutilated angular channels formed in said angular sides extending around said sides in both directions at an angle corresponding to the angle at which the thread is wound up on the cone.

6. In a winding cone having angular sides the

combination of angular mutilated ridges formed in said angular sides in both directions at an angle corresponding to the angle at which the thread is wound onto the cone.

7. In a winding cone having angular sides, longitudinal edges in said angular sides, mutilated angular channels formed in said edges and extending from one side of said edges to the other side thereof.

8. In a winding cone having angular sides and a polygonal cross section, mutilated angular channels extending across the edges of the flat sides of the cone from one side thereof to the other.

9. In a winding cone having a polygonal cross section with flat sides separated by angular longitudinal edges, said longitudinal edges having depressions formed therein with depressions on either side of the longitudinal edges in staggered relation to the depressions in the edges, and angular channels extending over said depressions from the smaller depressions on one side of the longitudinal edges over the larger depressions in the longitudinal edges and over the smaller depressions on the other side of the longitudinal edges.

10. In a winding cone having a polygonal cross section with flat sides separated by angular longitudinal edges, said edges having a series of depressions formed therein and cross ridges in said edges separating said depressions in said longitudinal edges.

11. A bobbin having a hollow polygonal body, flat undivided sides connecting the corners of said polygonal body to contract the edges on the curving of the sides from within the body, the corners of said polygonal body having depressions therein to hold the thread against end wise movement on the corners in their contracted as well as normal position.

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