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C. K. DUNLAP

1,896,135

THREAD CORE

Filed Feb. 25, 1931

FIG. 1.

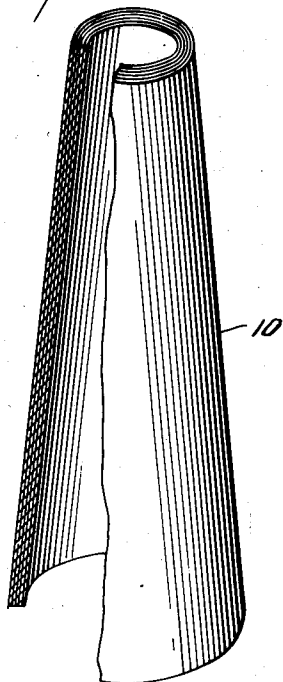


FIG. 2.

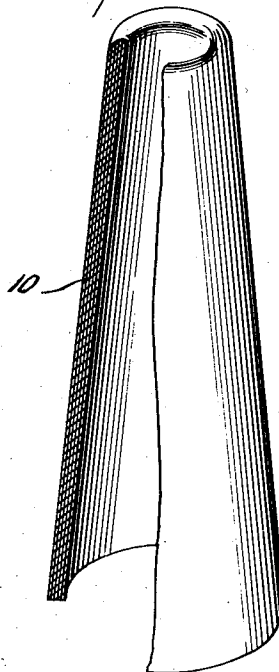
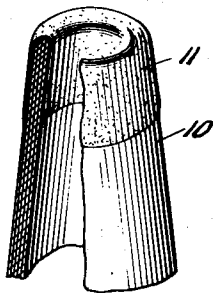


FIG. 3.



Inventor

Charles K. Dunlap,

334 Watson, Coit, Morse & Brindle  
Attorneys

# UNITED STATES PATENT OFFICE

CHARLES K. DUNLAP, OF HARTSVILLE, SOUTH CAROLINA, ASSIGNOR TO SONOCO PRODUCTS COMPANY, OF HARTSVILLE, SOUTH CAROLINA, A CORPORATION OF SOUTH CAROLINA

## THREAD CORE

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This invention relates to thread cores primarily intended for use in supporting packages of silk or other thread in knitting, weaving, dyeing, or other operations in the textile industry.

Many types of thread cores for supporting thread packages have heretofore been designed or suggested, but the type of such device which is most commonly used in the textile industry comprises a conical member of paper, upon the outer conical surface of which the thread package may be wound. It is a consideration of the first importance that the point or tip of such a cone be smooth in order not to catch the thread as it is being unwound from the thread package, this thread being withdrawn from the package axially of the core and past the small end thereof.

In the manufacture of these paper or fiber cones or tubes, a blank is usually first impregnated with an adhesive substance, such as paste, and then wound into conical or tubular form upon a mandrel. Following the winding operation, and while the cone is damp with adhesive and still on the mandrel, the rough ends thereof are cut off by spaced trimming knives, leaving it with annular end surfaces. The cone is then removed from the mandrel and dried. When dry, however, the circular outer edge at the small end of the cone, that is, the edge formed by the intersection of the conical outer surface and annular end surface, is always found to be ragged or rough and generally has portions projecting outwardly beyond the thread receiving surface. It is necessary, therefore, that this edge be smoothed before the cone can be used; otherwise the thread being unwound therefrom at a later time would in all likelihood be caught and injured or broken.

Various expedients have been heretofore resorted to for smoothing or rounding the circular edges of cone tips. It has been general practice to round and render smooth the entire tip end, the fiber of the tip being distorted by pressing the cone axially into a rapidly rotating die which breaks down the wall of the cone adjacent the tip, displacing

the fibrous wall inwardly and at the same time polishing its surface. Cones of this type are entirely satisfactory in use where the thread package and core are not subsequently subjected to water treatment, as by dipping or by being placed in humidification rooms.

It is found that, when a thread core which has had its small end polished in the manner indicated above is dipped in water or is placed in a moist atmosphere for a period of time, the distorted end of the cone tends to resume its original shape, swelling and losing its rounded contour and continuous polished surface. Hence it has been attempted also to provide means for retaining the rounded contour of the cone by other means, for instance, metallic caps, dipping in enamel, etc. A metallic cap will prevent the nose of a cone from resuming its original form but is cumbersome and expensive to apply and does not always properly fit the cone. By dipping the polished points of the cones in paint or enamel of waterproof character, the tendency of this portion of the cone to resume its original shape has been greatly lessened. Nevertheless it has been found that a cone, the tip of which has been treated with a waterproof substance such as enamel, will, when subjected to excessive contact with water, sometimes break the enamel due to swelling of the fiber, thereby rendering the cone useless and endangering any thread package which may have been positioned on the cone for humidification.

In accordance with the present invention, a method is provided for the manufacture of cones, or cores of other shape, of paper or fiber whereby the necessity for distorting the tip of the cone in a smoothing operation is completely avoided, the tip or point of the cone being smoothed in a novel manner, preferably by a burning operation which does not involve distortion of the fiber of the paper from which the cone is fabricated. By the burning operation the sharp, ragged, circular, outer edge of the cone at its point is removed and the tip, if desired, rounded. The resulting cone is not only eminently satisfactory from the standpoint of the knitter or weaver

but is more economical to fabricate and more durable. Various means may be employed for performing the operation of charring, singeing, or burning away portions of the tip of the cone to smooth the same, the invention not being limited in this respect.

In the accompanying drawing:

Figure 1 is a perspective view, partially broken away, of a paper or fiber cone after it has been wound and trimmed but before the tip has been rounded;

Figure 2 is a similar view showing the cone with a point which has been subjected to the improved smoothing operation; and

Figure 3 is a similar view showing the tip of a cone which has been subjected to the smoothing operation and then coated with enamel.

In the manufacture of a paper cone, as has been heretofore briefly pointed out, a paper blank impregnated with an adhesive substance, such as glue or paste, is wound upon a mandrel. While the mandrel is still rotating, spaced cutting knives descend and trim the ragged ends from the cone, reducing the cone to the desired length and leaving it with annular end surfaces. A cone which has been wound, trimmed, and dried is shown in Figure 1 of the drawing. It will be noted that the outer circular edge of the cone, at the small end thereof, is relatively sharp. This edge also is usually ragged and somewhat irregular, with portions which project outwardly therefrom upon which a thread may catch when being unwound from the core. It is therefore necessary to render smooth the circular outer edge of the cone, indicated at 10 in Figure 1, and in order to do that I subject this portion of the cone to a burning operation which consumes a small portion of the material of the cone, particularly removing the sharp, circular, outer edge at the point, and any ragged projections.

The exact apparatus for performing this may vary widely in type. The nose of the cone may be presented to a highly heated die or may be subjected to hot metallic members of various kinds or may be brought within range of minute flames. The burning or charring operation is continued until the edge of the cone has been properly smoothed. The cone may be rotated about its axis, while being burned by a stationary burning instrument. In this event it will be certain that the new surface uncovered by the burning operation will be concentric with the axis of the core. In the event that any blackened or charred portions remain after the cessation of this operation, the point of the cone may be subjected to a brushing operation.

Thereafter, if desired, the thread core may be immersed in a waterproofing compound to make it somewhat resistant to the action of water. Finally its tip may be coated with enamel by dipping the same in an enamel

bath so that it presents the appearance shown in Figure 3, a thin layer of enamel being indicated by the reference numeral 11. It is found that the enamel adheres with great tenacity to the charred surface of the cone.

By the smoothing and shaping of the point of the cone in the manner set forth, a very serviceable thread core is produced at small cost. The tip of the cone permits the perfect run-off of thread and yet is as mechanically strong as though it had not been subject to a smoothing or rounding operation. The fiber of the core is in its original condition, not being distorted in any way by the rounding operation and hence is well able to withstand the mechanical shocks incident to shipment and use without being damaged. The use of special treatments of the tip to preserve its shape is avoided, and it is unnecessary to provide any form of mechanical retaining or reinforcing device. Furthermore, the fibers of the material at the tip being undistorted, there is and can be no tendency of the tip to change its shape when subjected to wetting, no matter how prolonged.

It will be appreciated that the actual burning or charring operation may be performed in various ways and by means which differ widely in structure, the invention being of considerable modification in its application. The articles so treated may be cylindrical or conical or may have other shapes, the invention not being limited in this respect although its greatest usefulness will probably be realized in the manufacture of conical members of paper.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:—

1. The method of fabricating a thread core for use in the textile industry which comprises forming a tube by winding a sheet of paper upon itself, trimming the end of the tube to leave an annular end surface, and smoothing and rounding said end surface by a burning operation.

2. The method of fabricating a thread core for use in the textile industry which comprises forming a tube by winding a sheet of paper upon itself, and thereafter smoothing the end of the tube by a burning operation.

3. The method of fabricating a thread core for use in the textile industry which comprises forming an open ended hollow member of paper by winding a paper sheet into tubular form and thereafter smoothing the end thereof by a burning operation.

4. The method of fabricating a thread core for use in the textile industry which comprises forming an open ended hollow member of paper or like fiber and thereafter smoothing the end thereof by a burning operation.

5. The method of fabricating a thread core for use in the textile industry which comprises forming a tubular paper member hav-

ing an external thread receiving surface, and thereafter smoothing the end of said member, beyond the thread receiving surface, by a burning operation.

5 6. The method of fabricating a thread core for use in the textile industry which comprises forming a tubular paper member having an external thread receiving surface, smoothing the end of said member by a burning  
10 operation, and coating the end thus smoothed with enamel.

7. A paper article for use as a core for thread windings in the textile industry comprising a member having an external thread  
15 receiving surface and a smooth rounded surfaced end past which thread may be freely drawn without catching, the paper fibers immediately beneath said rounded end surface being undistorted and those fibers extending  
20 to said surface terminating in charred ends lying in said surface.

8. A paper article for use as a core for thread windings in the textile industry, comprising a spirally wound tube, the convolutions of which are secured together by an adhesive  
25 substance, and the outer surface of which is a thread receiving surface, the circular end surface of the tube past which thread is axially withdrawn from a thread package mounted on said surface being smooth and  
30 rounded, the paper fibers immediately beneath said rounded end surface being undistorted, and those fibers extending to said surface terminating in charred ends lying in said  
35 surface.

9. A paper article for use as a core for thread windings in the textile industry comprising a member having an external thread receiving surface and a smooth surfaced end  
40 past which thread may be freely drawn without catching, the paper fibers immediately beneath said rounded end surface being undistorted and those fibers extending to said surface terminating in charred ends lying in  
45 said surface, and a smooth coating of enamel overlying said end surface and a portion of the adjacent thread receiving surface.

In testimony whereof I hereunto affix my  
50 signature.

CHARLES K. DUNLAP.

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