

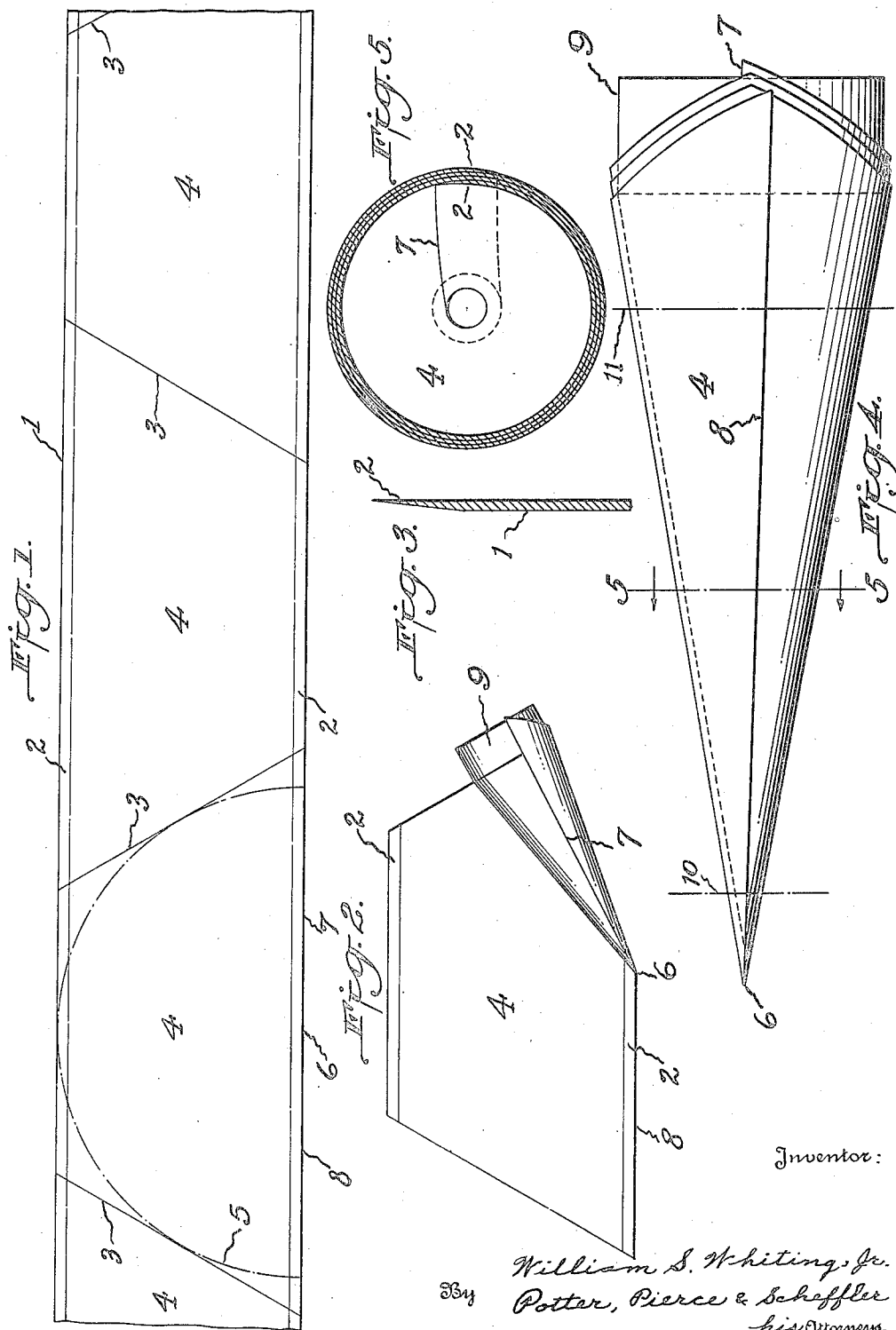
Oct. 6, 1936.

W. S. WHITING, JR

2,056,636

CONE MANUFACTURE

Filed June 29, 1934



Inventor:

By

William S. Whiting, Jr.
Potter, Pierce & Schaffler
his Attorneys.

UNITED STATES PATENT OFFICE

2,056,636

CONE MANUFACTURE

William S. Whiting, Jr., Canton, N. C., assignor
to The Champion Fibre Company, Canton,
N. C., a corporation of Ohio

Application June 29, 1934, Serial No. 733,138

2 Claims. (Cl. 93—94)

This invention relates to the manufacture of cones of the type in which a sheet of cone-forming material (e. g., paper) is conically wound upon itself a plurality of times, the windings being caused to adhere to each other by the imposition therebetween of suitable adhesive material. More particularly, the invention is concerned with improvements in that phase of said manufacture which relates to the provision of paper cones presenting no longitudinal terminal ridges (i. e., whose inside and outside surfaces present substantially true surfaces of revolution) formed from blanks or patterns provided with deckle, or "feathered", edges at those portions of the blank or pattern which in the finished cone are the inside and outside longitudinal terminals of the windings. The invention relates as well to the improved method of forming the cones as to the blanks or patterns from which they are formed and to the resulting product of that improved method. The invention finds a preferred embodiment in the production of the rough-surfaced, relatively rigid, cones used in textile mills for winding threads.

The general method which is improved in one aspect of the present invention is as follows: an appropriate blank or pattern is first thoroughly coated with a suitable adhesive substance, e. g., an adhesive paste, and, while damp with adhesive is wound into conical form upon a mandrel; thereafter the ends of the roughly formed conical object are trimmed whereby to provide top and bottom annular end surfaces at a predetermined distance from, and parallel to, each other and lying in planes at right angles to the axis of the cone. The resulting cones may be, and usually are, finally operated upon whereby to smooth and/or round off the upper (i. e., smaller) end surface. In pursuance of this general method it heretofore had been suggested that a pattern or blank having at least one deckle, or feathered, edge may be employed, whereby to yield a cone having an outer, and/or inner, surface which is a true surface of revolution without having to resort to grinding or abrading of the surface in order to obviate the disadvantages incident to a longitudinal ridge along the thread-receiving space of the cone.

In prior art practices it had been proposed to use, as the blanks from which such cones were formed, semi-circular shapes or else sectors having curved edges and approximating semi-circles; these shapes were cut out of sheets of paper, yielding thereby considerable waste or "broke", were wound into cones upon the mandrel, and then

trimmed at top and bottom, yielding further quantities of waste or "broke". In this connection, it may be remarked that, no matter how accurately a blank or pattern may be cut to shape, it will be necessary to trim the resulting rough cone at both top and bottom, because the winding up of such blank into conical form is not so adaptable to absolute precision as to obviate the necessity for correction of the form of the object of further trimming, the use of these cones being such as to demand therein practically exact dimensions and shape. In carrying out this general method, it had been proposed to cut the semi-circular blanks out of a deckle-edged sheet, the deckle edge forming the straight side of the semi-circle.

An object of the present invention is the provision of an improved method of manufacturing cones (e. g., textile cones). Another object of the invention is the provision of a novel blank, and method of cutting out such blanks. Still another object of invention is the provision of an improved textile cone.

My improved method of making cones comprises dividing a double deckled straight sided strip of paper of the appropriate width, without waste, into blanks of the shape of a symmetrical trapezium whose height is so related to the base as to yield a figure circumscribing a semi-circle and whose parallel base and top are deckle-edged, suitably pasting such blanks, winding such pasted blanks into a cone, and suitably trimming the ends of the resulting cone whereby to yield a truncated hollow cone of desired height and size with parallel annular top and base edges.

In getting out the novel blanks of the present invention the double deckle-edged, straight sided strip simply is severed into alternating trapezia by a series of alternating bias cuts, the top and bottom edges of said trapezia being feathered or deckled.

It should be observed that in dividing the said strip into blanks the division is accomplished without the creation of any waste or "broke", the blanks if laid out on the strip from which they are to be severed being alternately reversed symmetrical trapezia whose adjacent sides coincide and whose alternate tops and bottoms lie in two parallel straight lines. Differently expressed, the bias cuts are reciprocal in angularity, and with their media lying in a straight line parallel to the two edges of the strip, each bias cut being in effect two coincident tangents of two contiguous alternately reversed semi-circles.

In the step of winding one of these blanks into

a cone, the pasted blank is presented to the mandrel in such manner that the latter contacts one half of the base of the trapezium with the point of the mandrel at about the middle of the base, and the mandrel is caused to revolve while the blank is pressed against the mandrel, or against the underlying turn of the blank, the revolution of the mandrel serving to roll up the blank into a cone whose apex coincides with the median point of the base of the trapezium-shaped blank. Thereafter the resulting conically shaped object is trimmed, as by pressing thereagainst, while the mandrel and object mounted thereon are revolved, parallel spaced trimming means, e. g., knives, whereby to truncate the conical apex of the object for a suitable distance therealong and to trim off the ragged base of the object up to the desired distance from the annular top surface of the so-truncated object. In this wise there is formed a cone along whose inner surface extends as a longitudinal seam one portion of the deckle-edged base of the blank and along whose outer surface extends as a longitudinal seam another portion of the deckle-edged base of the blank, the two seams preferably being so overlapped as to be complementary of each other and in effect to yield a single thickness of material.

The invention will be described in greater detail with reference to the accompanying drawing, in which

Fig. 1 is a plan view of a portion of a strip of material, suitable for the purposes of the invention, indicating the lines of division thereof into a plurality of members;

Fig. 2 is a plan view of one member of Fig. 1, and illustrating the beginning of the formation from said member of a cone on a mandrel;

Fig. 3 is a greatly enlarged fragmentary cross-section of an edge of the web shown in Fig. 1 and illustrating the deckle forming part thereof;

Fig. 4 is an enlarged view of the completely rolled and partially finished cone, the location of the mandrel therein being shown partly in dotted lines; and

Fig. 5 is an enlarged transverse section, taken substantially in the plane of line 5-5 of Fig. 4.

In the drawing, 1 represents a strip of paper having two deckled edges 2, 2. 3, 3, 3, 3, represent the locations for alternately reciprocal bias cuts and indicate the boundaries of a plurality of blanks or patterns 4, 4, 4, 4. 5 represents, in broken line, a semi-circle inscribed within one member (i. e., pattern) of the strip 1 about the middle point 6 of the longer of the parallel edges of the member. The point 6 divides the said edge into two equal parts 7 and 8, respectively. 9 represents a conventional mandrel for use in winding up a blank into conical form. 10 and 11 indicate desirable planes of truncation and trimming, respectively, of the wound blank whereby to yield the desired cone.

With reference to Fig. 1, it will be noted that the strip 1 is cut up into operable blanks 4, 4, without waste of material, by means of diagonal cuts

3, 3, of alternating angularity defining symmetrical trapezia. In said figure the inscribed semi-circle 5, shown in broken line, roughly represents (except for that small portion which is lost upon truncating the cone) that portion of the blank 4 which is actually used up in the wrapping of a cone, those outer portions between the dotted line 5 and the sides 3, 3 and top of the trapezium which are trimmed off after the cone is formed, being together with that other small portion lost upon truncating the cone as at 10 the only waste or "broke" yielded by my process. Thereby a very considerable saving in stock is effected. Moreover, the fact that waste or "broke" is created at a single operation, i. e., during the cone trimming operation, is an advantage over creation of "broke" at a plurality of points in the process.

The actual severing or dividing of the strip into trapezia may be effected by any means such, for instance, as a manually operated knife, or a mechanically operated knife, of known structure. In the case of manual operation, a suitable template or pattern may be employed, if desired, for locating the cut.

The actual operation of forming the flat, pasted blank into a conical object is, according to the present invention, conventional: the blank 4, after being pasted, is brought into contact with a rotatable mandrel 9 in such fashion that the deckled base of the blank lies longitudinally along the mandrel with the point of the latter at or closely adjacent to the center 6 of the said base and portion 7 is pressed against the mandrel in any desired manner; the mandrel 9 is caused to revolve while the blank 4 continues to be pressed against it, the revolutions of the mandrel serving to wrap the blank about the mandrel surface and then over itself a plurality of times. Thereafter the resulting conical object may be, and preferably is, truncated and trimmed as at 10 and 11, respectively. Of course, where truncation and/or trimming is not called for in the final product the one and/or the other of these operations may be omitted.

I claim:

1. Improved method of making cones which comprises dividing a double deckled straight sided strip of paper into portions each of symmetrical trapezium shape and having deckled top and bottom edges, pasting such portions, winding such pasted portions into a cone in such manner that the said deckled bottom edge of the portion forms an inner longitudinal seam and an outer, complementary, longitudinal seam of the cone, and trimming the ends of the resulting conical object.

2. A blank of paper adapted to be rolled into conical shape, said blank being in form a symmetrical trapezium whose top and bottom are deckle edges and whose height is so related to its base dimension as to yield a figure circumscribing a semicircle.

WILLIAM S. WHITTING, JR.