

PATENT SPECIFICATION

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DRAWINGS ATTACHED



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(54) IMPROVEMENTS IN OR RELATING TO UMBRELLAS

(71) We, TELESKO BROPHEY LIMITED, a Canadian body corporate, of 8765, Park Avenue, Montreal 11, Canada, do hereby declare the invention, for which we pray that a patent may be granted us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a frame for an umbrella of the so called "flat" type having a substantially rectangular cross-section when closed, and having a stick with a crown at one end and a handle at the other end and ribs for supporting a circular canopy pivoted at their inner ends to the periphery of the crown and lying substantially parallel to the stick between the crown and the handle in the closed position of the frame.

In flat umbrellas, it is known to select constructions such that when the umbrella is raised its canopy is elliptical in shape. These constructions are disadvantageous to manufacture, since the umbrella covering comprises segmental portions cut to size and it is more advantageous, from the manufacturing point of view, if the segmental portions are of identical shape. These constructions also have considerable disadvantages in use, for, whilst it is true that the shoulders of the person using the umbrella may be adequately protected against rain coming down vertically, if the longer axis of the ellipse extends transversely of the direction in which the user walks, there is all the less protection for user's legs walking forwards from underneath the umbrella.

Methods have therefore been attempted of constructing umbrellas which close into a substantially rectangular cross-sectional shape in such a way that when the umbrella is raised its rib ends lie on a circular line, using ribs and struts of different lengths. The ribs articulated to the crown closer to the tumbrella stick are longer than the ribs articulated to the crown further out from the umbrella stick. To further simplify the making of the umbrella covering, which must

consist of identical segmental portions, eyelets have been disposed at spaced positions along the outer end portion of each umbrella rib to enable the umbrella covering to be attached to the ribs as required. From the manufacturing aspect it is unjustifiable to use umbrella ribs of different lengths because the umbrella becomes too expensive, although such umbrellas are manufactured on an extremely large scale. It is true that the use of a plurality of eyelets disposed at the ends of the ribs somewhat facilitates the obtaining of the different umbrella rib lengths; the corresponding excess lengths, together with the superfluous eyelets, being removed. However, this extra process is also quite expensive from the manufacturing aspect. Not only is an extra operation required to remove the superfluous eyelets, but the points of removal must, if necessary, also be given a suitable surface finish, for instance, be chromium plated after the removal. As regards the umbrella ribs which have to be longest and in which there is, therefore, no shortening, the required shortening places, inevitably provided, produce the danger that the umbrella will break at these points under fairly heavy loadings.

Attempts to use ribs of identical length with their inner ends pivoted equidistant from the stick axis has resulted in bunching of the ribs not conducive to closing of the umbrella into a shape with a substantially rectangular cross section.

According to the invention, in a frame for a flat umbrella having a substantially rectangular cross section when closed, the frame being of the kind having a stick with a crown at one end and a handle at the other end and eight ribs for supporting a circular canopy pivoted at their inner ends to the periphery of the crown and lying substantially parallel to the stick between the crown and the handle in the closed position of the frame, the crown is elongate in a plane normal to the stick axis and has two wings diametrically opposed across the stick axis,

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and the eight ribs are pivotally attached to the crown symmetrically with respect to the longitudinal and transverse axes of the crown in the plane normal to the stick axis but with all of the ribs angularly spaced from these axes about the stick axis, the ribs of each pair of ribs which, on each wing, are opposed across the longitudinal axis of the crown radiating substantially, when the frame is open, as seen in the direction of the stick axis, from imaginary points of intersection adjacent to the center of the wing to which that pair of ribs is pivotally attached.

An umbrella incorporating such a frame closes very neatly into a shape with a substantially rectangular cross section. Also it enables the use of identical ribs and a circular canopy made up from identical segments provided that the ribs are arranged so that, although their inner ends are not all equidistant from the stick axis their tips lie on a circle when the frame is covered with a circular canopy and is open. This may be provided by arranging for the ribs to bend by different amounts, or, in the case of a frame for a shortenable umbrella in which the stick and ribs each incorporate telescopic sections, by arranging for the ribs to extend telescopically by different amounts.

In one construction, which is considered to be best, there are eight ribs, one extending from each of the two opposed sides of each wing and two projecting from that end of each wing which is radially outermost relatively to the stick axis.

Preferably, a separate strut interconnects each rib and a common slider slides along the stick to control the opening and closing of the frame, the slider having a pair of wings diametrically opposed across the stick axis and providing together an elongate shape similar to that of the crown, the struts being pivotally attached to the wings in a configuration around the stick axis corresponding to that in which the inner ends of the ribs are pivotally attached to the crown around the stick axis.

An example of an umbrella incorporating a frame constructed in accordance with the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of the umbrella closed, shortened, and contained in a case;

Figure 2 is an inside view from below the raised umbrella, with the handle removed;

Figure 3 is a partial view of the umbrella crown from below;

Figure 4 is a partial section taken on the line IV—IV in Figure 5;

Figure 5 is a partial side elevation of the upper part of the raised umbrella;

Figure 6 shows diagrammatically the different extent to which adjacent umbrella ribs bend; and,

Figure 7 shows a perspective view of the raised umbrella.

The illustrated umbrella has an umbrella stick 1 consisting of three telescopic tubes 2, 3, 4. The bottom tube 4, which is the smallest cross-section, bears a handle 5 of substantially rectangular cross-sectional shape. At its top, the umbrella stick 1 bears a crown 6 of substantially rectangular cross section having two wings 7, 8 diametrically opposed across the stick 1. Running along the stick 1 is a main slider 9 having wings 10, 11, diametrically opposed across the stick. An auxiliary slider 12 also runs along the stick 1 and has two wings 13, 14, diametrically opposed across the stick. Identical two part telescopic umbrella ribs 15 to 22 are articulated to the wings 7, 8 of the crown 6 at positions angularly spaced about the stick axis from the major axis $x-x$ and minor axis $y-y$ of the crown 6. Pairs of umbrella ribs 15, 16; 19, 20 are articulated to the end faces 23; 24 of the wings 7; 8 respectively. Each of the ribs 15, 16, 19 and 20 is at an angle α to the longer axis $x-x$ of the crown 6. Umbrella ribs 17, 18, 21, 22 are each articulated to the sides 26 25, respectively of the wings 7, 8. However, this is again done in such a way that the ribs are angularly spaced about the stick axis from the axis $y-y$ of the crown 6. Each of the umbrella ribs 17, 18, 21 and 22 is aligned at an angle β to the axis $y-y$ of the crown 6.

It will also be apparent that the ribs of the pairs 15 and 16, 22 and 17, 21 and 18, and 20 and 19, radiate from imaginary points of intersection on the axis $x-x$, adjacent to the centre of the corresponding wing 10 or 11.

As a result of this special association of the ribs in relation to the axes $y-y$ and $x-x$ of the crown 6, there are no extreme differences in the distances of the rib ends from the stick. The elimination of the remaining small differences in order that the umbrella rib ends 15' to 22' may be on a circular line K, as shown in Figure 2, co-axial with the umbrella stick 1, is achieved by the umbrella ribs 15, 16, 20, 21 articulated further out on the crown wings 7, 8, being flexed to a greater extent. This greater extent of flexing, achieved when the umbrella is raised by the tension in the identical segments of the canopy to which the outer ends of the ribs are stitched, is diagrammatically illustrated in Figure 6. Each of umbrella ribs 22; 17, 18 and 21 such as rib 22 shown as a solid line, bend to a lesser extent than each of the umbrella ribs 15, 16, 19 and 20, such as rib 15 shown as a chain line.

The alignment and articulation of the struts 27 to the wings 10, 11 of the slider 9, and also the alignment and articulation of the auxiliary struts 28 to the wings 13, 14

of the auxiliary slider 12, correspond to the angular alignment and articulation of the umbrella ribs 15 to 22 to the crown 6. The slider 9 is continued below the wings 10, 11 in a sleeve 29 through which the umbrella stick passes. The sleeve 29 is formed with a longitudinal channel in which a catch 30 is mounted. The catch 30 and the longitudinal channel extend in alignment below the wing 11. The handle 5 is formed with a socket 31 which the sleeve 29 enters on shortening of the umbrella. The handle 5 is formed, on opposite sides of the socket, with compartments 32 for receiving and retaining the umbrella rib ends 15' to 22'.

The umbrella ribs 15 to 22, the struts 27 and the auxiliary struts 28 are articulated to the wings 7, 8, 10, 11, 13, 14 by means of wire loops 33, each wing having a separate portion of wire 33. The wire loops lie in grooves in the peripheries of the wings and pass through holes in flattened inner end portion of the ribs and struts, these flattened inner end portions lying in slots at the peripheries of the wings, which slots restrain the ribs and struts to pivot in planes parallel to the stick.

The crown 6 has a cover plate 34 below which there extends an umbrella canopy 35 made up of individual identical generally segmental portions E.

The umbrella is collapsed from the Figure 7 configuration in the usual way, that is by releasing the main slider catch 30 and drawing the main slider 9 along the stick 1 towards the handle. As a result the ribs 15 to 22 and struts 27 and 28 fold down parallel to the stick 1. The umbrella is then shortened by pressing the handle 5 and rib tips towards the crown 6 whereupon the stick 1 and ribs shorten telescopically. The canopy is wrapped around the ribs and stick and the umbrella is ready for insertion into its case.

WHAT WE CLAIM IS:—

1. A frame for a flat umbrella having a substantially rectangular cross section when closed, the frame being of the kind having a stick with a crown at one end and a handle at the other end and eight ribs for supporting a circular canopy pivoted at their inner ends to the periphery of the crown and lying substantially parallel to the stick between the crown and the handle in the closed position of the frame, wherein the crown is elongate in a plane normal to the stick axis and has two wings diametrically opposed across the stick axis, and the eight ribs are pivotally attached to the crown symmetrically with respect to the longitudinal and transverse axes of the crown in the plane normal to the stick

axis but with all of the ribs angularly spaced from these axes about the stick axis, the ribs of each pair of ribs which, on each wing, are opposed across the longitudinal axis of the crown radiating substantially, when the frame is open, as seen in a direction parallel to the stick axis, from imaginary points of intersection adjacent to the centre of the wing to which that pair of ribs is pivotally attached.

2. A frame according to Claim 1, wherein the inner end of each rib is pivotally mounted in an individual slot at the periphery of the crown which substantially restrains that rib to pivot in a plane between the open and closed position of the frame.

3. A frame according to Claim 1 or Claim 2, in which the ribs are identical and are arranged so that although their inner ends are not all equidistant from the stick axis their tips lie on a circle when the frame is covered with a circular canopy and is open.

4. A frame according to any one of the preceding claims, which has eight ribs, one extending from each of the two opposed sides of each wing and two projecting from that end of each wing which is radially outermost relatively to the stick axis.

5. A frame according to any one of the preceding claims, in which a separate strut interconnects each rib and a common slider slides along the stick to control the opening and closing of the frame, the slider having a pair of wings diametrically opposed across the stick axis and providing together an elongate shape similar to that of the crown, the struts being pivotally attached to the wings of the slider in a configuration around the stick axis corresponding to that in which the inner ends of the ribs are pivotally attached to the crown around the stick axis.

6. A frame according to any one of the preceding claims, for a shortenable umbrella, in which the umbrella stick and ribs each incorporate telescopic sections.

7. A frame according to Claim 1, substantially as described with reference to the accompanying drawings.

8. A flat umbrella incorporating a frame according to any one of the preceding claims.

9. An umbrella according to Claim 8, having a circular canopy made up from a number of identical segments equal in number to the number of ribs, each of the segments extending substantially between a pair of adjacent ribs and being attached to the outer ends of the ribs.

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of the auxiliary slider 12, correspond to the angular alignment and articulation of the umbrella ribs 15 to 22 to the crown 6. The slider 9 is continued below the wings 10, 11 in a sleeve 29 through which the umbrella stick passes. The sleeve 29 is formed with a longitudinal channel in which a catch 30 is mounted. The catch 30 and the longitudinal channel extend in alignment below the wing 11. The handle 5 is formed with a socket 31 which the sleeve 29 enters on shortening of the umbrella. The handle 5 is formed, on opposite sides of the socket, with compartments 32 for receiving and retaining the umbrella rib ends 15' to 22'.

The umbrella ribs 15 to 22, the struts 27 and the auxiliary struts 28 are articulated to the wings 7, 8, 10, 11, 13, 14 by means of wire loops 33, each wing having a separate portion of wire 33. The wire loops lie in grooves in the peripheries of the wings and pass through holes in flattened inner end portion of the ribs and struts, these flattened inner end portions lying in slots at the peripheries of the wings, which slots restrain the ribs and struts to pivot in planes parallel to the stick.

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axis but with all of the ribs angularly spaced from these axes about the stick axis, the ribs of each pair of ribs which, on each wing, are opposed across the longitudinal axis of the crown radiating substantially, when the frame is open, as seen in a direction parallel to the stick axis, from imaginary points of intersection adjacent to the centre of the wing to which that pair of ribs is pivotally attached.

2. A frame according to Claim 1, wherein the inner end of each rib is pivotally mounted in an individual slot at the periphery of the crown which substantially restrains that rib to pivot in a plane between the open and closed position of the frame.

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