Aug. 29, 1933. S. Z. WILLIAMS 1,924,427

PAPER UMBRELLA

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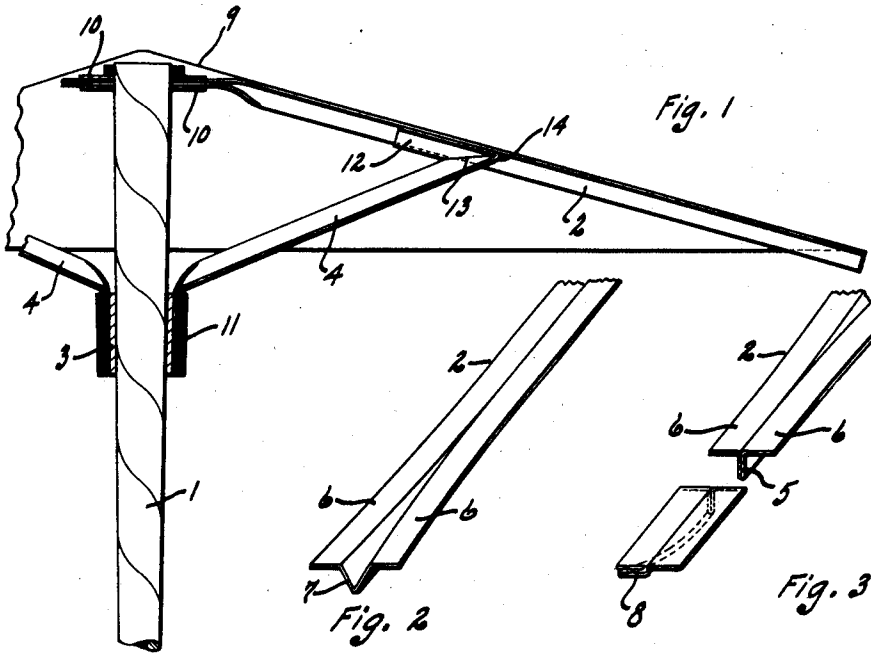

Fig. 1

Fig. 2

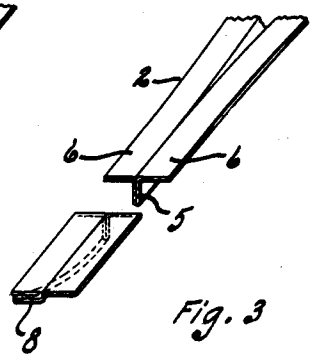

Fig. 3

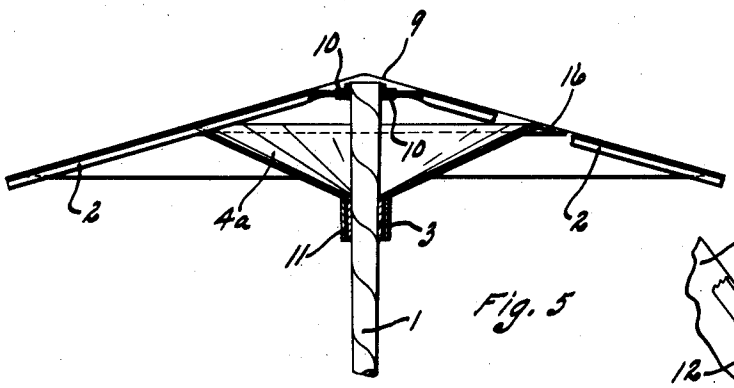

Fig. 5

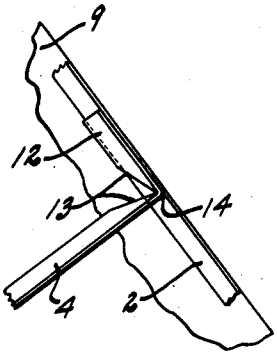

Fig. 4

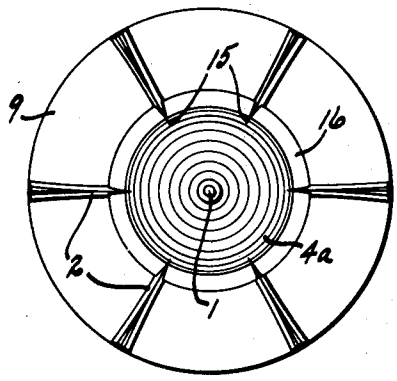

Fig. 6

INVENTOR

Seaborn Z. Williams

BY

Brockett, Hyde, Higley & Meyer

ATTORNEYS

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PAPER UMBRELLA

Seaborn Z. Williams, Cleveland, Ohio

Application May 13, 1932. Serial No. 611,055

10 Claims. (Cl. 135—20)

This invention relates to umbrellas and its object is to provide an umbrella of a type so inexpensive that it may be discarded, once used.

The invention comprises generally improvements over that of my copending application, Serial No. 611,054, filed of even date herewith.

The invention contemplates, as a further object, a construction entirely or substantially so, of paper or equivalent similar material, and to this end the invention includes numerous devices by which the material is employed in the umbrella structure.

The exact nature of this invention together with further objects and advantages thereof will be apparent from the following description taken in connection with the accompanying drawing, in which Figs. 1–4 inclusive illustrate one embodiment and Figs. 5 and 6 another. More particularly Fig. 1 is a detail in sectional elevation showing pertinent parts of the umbrella in extended relation; Figs. 2 and 3 are perspective details of the rib member employed; Fig. 4 is a detail in elevation showing a preferred manner of joining rib and strut members; Fig. 5 is a sectional view of a modification employing a different type of strut means; and Fig. 6 is a bottom view of the same to a reduced scale.

With reference now to the drawing and particularly Figs. 1–4 thereof, it will be apparent that the principal parts and their general disposition follows the contemporaneous art; the umbrella including a flexible cover and a collapsible and extensible frame therefor.

The principal parts of the frame are a stem, spindle or handle, 1, a plurality of ribs 2 swingably connected with the end of the spindle, a sleeve 3 slidable along the spindle, and for each rib 2 a strut 4 joining the sleeve 3 with the rib, intermediate the ends of the latter, the strut having flexible connection with those parts which it connects; so that, as in the ordinary umbrella, sliding motion of the sleeve 3 along the spindle 1 will adjust the ribs 2 between extended relation, that indicated Fig. 1, and a closed position wherein the ribs and struts are alongside the spindle.

The spindle 1 is preferably of circular section and may comprise a roll of paper as indicated in the drawings and as more fully described in my said copending application.

According to this invention the rib and strut members are each formed from a strip of paper of sufficient thickness for the purpose intended, longitudinally bent to form a T-section with a stem part 5 of double thickness and arm parts 6 extending therefrom, as indicated Figs. 2 and 3. This T-section is characteristic of these frame members, that is, each of these members has such section throughout most of its length.

Considering now one of the rib members, it has this section through most of its extent. At its outer end the stem part 5 of the T may be extended into a V as at 7, Fig. 2, during the operation of the umbrella as will appear. At its other end, the stem part 5 is folded upon one of the arm parts 6 as at 8, Fig. 3.

The spindle ends of the ribs, thus flattened, are secured with the spindle 1 as between a pair of annular members 10 fitting over the spindle end. The parts, being of paper or the like, may be glued together to maintain the described assembly; in which it will be apparent that the ribs have rigidity substantially through their lengths, but each may flex at its flattened end, and thus has flexible connection with the spindle 1 for swinging movement in the plane of the latter.

It will be observed that the ribs 2 and particularly their arm parts 6 may define a cone of adjustable pitch. A conical cover 9 of paper or the like is overlaid upon the ribs 2 and secured to the upper faces of the arms 6 of the ribs, as by gluing.

The function of the struts 4 is obviously to join the sleeve 3 with the ribs 2, that the latter may have adjustment by manipulation of the former, to open and close the umbrella and particularly the cover 9 thereof.

Each strut 4 has rigidity throughout and along its intermediate part by virtue of the T-section described. At its sleeve end each strut is flattened as are the ribs. The sleeve ends of the struts are secured to the sleeve as by binding thereto with a strip of paper 11 bound thereabout, the parts being also glued.

Each strut is at its opposite end joined with its rib, preferably in the manner indicated. An end part 12 is disposed over the rib in nested relation, the stem part 5 of the strut straddling that of the rib, and the arm parts 6 of the strut being glued to those of the rib. Preferably the stem part 5 of the rib is notched as at 13 Fig. 4 down to the arm parts 6 so that a hinge joint is defined at 14, the bottom of the notch 13. By this arrangement the intermediate part of the strut will remain rigid and undeformed, it will have in effect a hinge connection at 14, and its end part 12 will be located upon its rib by interengagement of the stem parts 5 as well as by the gluing together of the arm parts 6.

If preferred, the notch 13 may be omitted.

Thereupon when the strut is flexed by its relative motion with the rib, it will be deformed, tending to assume a shape characterized by a W-section.

The cover 9 being secured to the faces 6 of the ribs 2, as the parts are extended to spread relation, that indicated Fig. 1, the ribs may spread at their outer ends as indicated at 7, Fig. 2, contracting to the typical T-section as the umbrella is closed.

With reference now to the modification of Figs. 5 and 6, the construction is similar to that described except that conical strut means are employed. Such means comprise a cone 4*a* of paper having its apex end secured with the sleeve 3 in any convenient manner. At its periphery the member 4*a* is slit radially at 15 to match the spacing of the ribs 2, and therebetween bent to form segmental flanges 16, parts of a peripheral flange. These flange parts are secured as by gluing to both the cover 9 and the arm parts 6 of the ribs, the stem parts 5 of the ribs projecting into the slits 15.

As the umbrella is opened and closed the conical strut member 4*a* will crease along natural radial lines similarly as the cover 9 acts under the same conditions.

What I claim is:

1. In an umbrella of the class described and having a spindle, ribs, secured to one end thereof, and a sleeve movable therealong, strut means joining said sleeve with said ribs and comprising a conical member of paper, said member being bent to form a peripheral flange, and a cover over said ribs and secured to said flange.

2. In an umbrella of the class described having a spindle, a sleeve, and ribs, said ribs being secured to one end of said spindle and comprising strips of paper longitudinally bent to form T-sections with stem parts of double thickness and arm parts extending therefrom, said arm parts defining a cone, said sleeve being movable along said spindle; and strut means joining said sleeve with said ribs and comprising a conical member of paper, said member being bent to form a peripheral flange lying in said cone, said member having radial slits to clear the stem parts of said ribs, and said flange overlying and being secured to said arm parts of said ribs.

3. In an umbrella of the class described having a spindle, ribs secured to one end thereof, a sleeve movable therealong, and a cover, strut means joining said sleeve with said ribs and comprising a conical member of paper, said ribs comprising strips of paper longitudinally bent to form T-sections with stem parts and arm parts, the latter defining a cone, said conical member being bent to form a peripheral flange lying in said cone, and having radial slits to clear the stem parts of the rib members, said cover being positioned over said ribs and strut means and secured to said arm parts of said ribs and said flange part of said strut means.

4. In an umbrella frame, a pair of cooperative rib and strut members, each comprising a strip of paper longitudinally bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said strut member having the arm parts at its end overlying and secured to those of said rib member.

5. In an umbrella frame, a pair of cooperative rib and strut members, each comprising a strip of paper longitudinally, bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said strut member having an end overlying said rib member, with its stem part straddling that of said rib member and its arm parts secured to those of said rib member.

6. In an umbrella frame, a pair of cooperative rib and strut members, each comprising a strip of paper longitudinally bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said strut member having an end overlying said rib member, with its stem part straddling that of said rib member and its arm parts secured to those of said rib member, the strut member stem part being cut away to locate a swinging joint between said members.

7. An umbrella frame member comprising a strip of paper longitudinally bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said stem part at an end of said member being folded upon one of said arm parts whereby said member at said end is flexible in the plane of said parts, and elsewhere has rigidity.

8. In an umbrella frame having a spindle, a rib comprising a strip of paper longitudinally bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said stem part at the spindle end of said rib being folded upon one of said arm parts and secured to said spindle, whereby said rib may swing in the plane of said spindle but has rigidity at points removed from said spindle.

9. In an umbrella frame having a spindle, a plurality of cooperative ribs, each rib comprising a strip of paper longitudinally bent to form a T-section with a stem part of double thickness and arm parts extending therefrom, said stem parts at the spindle ends of said ribs being folded each upon one of its arm parts, and a pair of annular members arranged about said stem to secure therebetween said flattened rib ends.

10. In an umbrella of the class described and having a spindle, ribs secured to one end thereof, and a sleeve movable therealong and arranged to control associated strut means joining said sleeve with said ribs, said spindle having a conical portion and said sleeve comprising a correspondingly conical member of rolled paper, said sleeve and spindle being so proportioned that their conical parts may have frictional engagement to maintain said strut and rib means in extended relation.

SEABORN Z. WILLIAMS.