Jan. 10, 1961 S. N. SMALL 2,967,379

FOLDING MULTIPLE RIGID SECTION UMBRELLAS

Filed April 28, 1958

FIG. 1

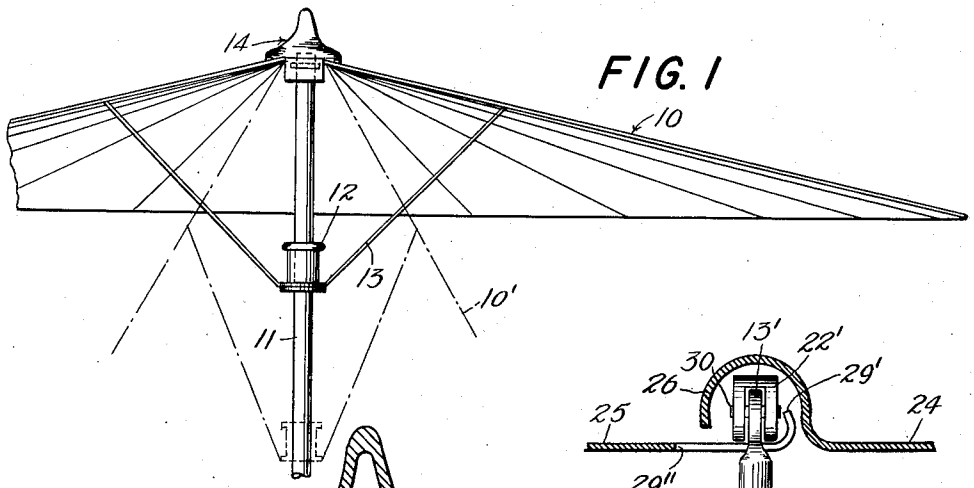


FIG. 6

FIG. 2

FIG. 3

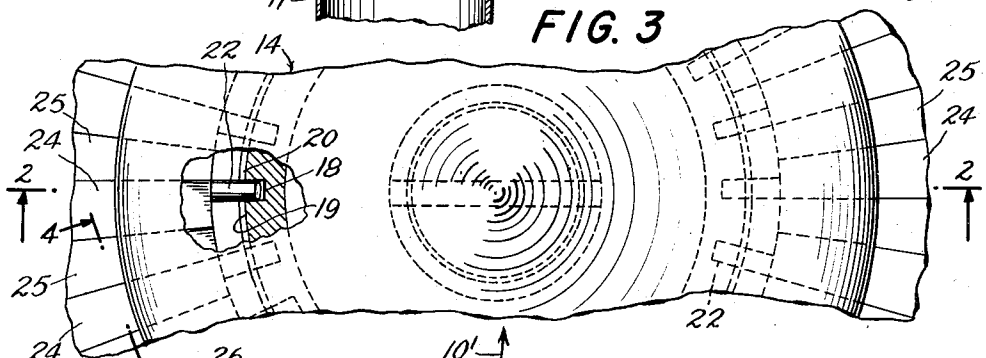


FIG. 4

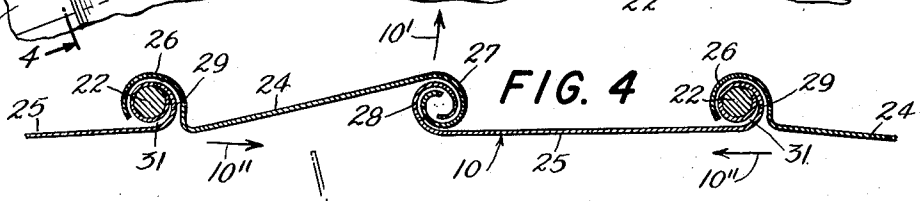
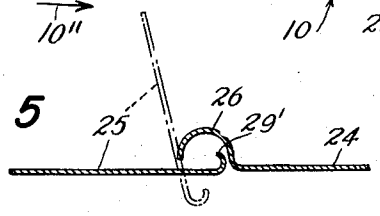


FIG. 5



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FOLDING MULTIPLE RIGID SECTION UMBRELLAS

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11 Claims. (Cl. 50—49)

This invention relates to umbrellas, wherein the umbrella top is formed from a plurality of hingedly coupled sections of rigid material such, for example, as aluminum, thereby providing a strong and durable umbrella structure. More particularly, the invention deals with an umbrella top, wherein rods are arranged in predetermined circumferentially spaced pivots of the umbrella top at the upper central portion of the top, with means pivotally coupling the upper ends of the rods with a post finishing member centrally of the umbrella top and, further, with runner actuated brace rods pivoted to the outer end portions of said rods.

Still more particularly, the invention deals with a structure of the character described, wherein means is provided on said circumferentially spaced section hinges for assemblage of the rods and for movement of the runner brace rods therein.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is a diagrammatic broken sectional view through the umbrella top, showing the upper end portion of the post and the runner slidable on the post and indicating in dot and dash lines diagrammatically a partial collapsing of the umbrella top.

Fig. 2 is an enlarged sectional detail view of the upper central portion of the umbrella top, illustrating pivotal coupling of sections of the umbrella top with a post finishing member and further illustrating broken away portions of the hinge coupling between two of the hinge sections.

Fig. 3 is a partial plan view of the structure shown in Fig. 2, with part of the construction broken away and in section.

Fig. 4 is an enlarged sectional detail view substantially on the line 4—4 of Fig. 3, illustrating the hinge coupling between adjacent sections of the umbrella top.

Fig. 5 is a section on the line 5—5 of Fig. 2, indicating in dot-dash lines the position of one of the sections in assemblage of the pivot rods; and

Fig. 6 is an enlarged section on the line 6—6 of Fig. 2, illustrating the pivotal coupling of the runner brace and operating rods with the pivot rods of the umbrella top.

In Fig. 1 of the drawing is shown a very rough diagrammatic illustration to portray the general arrangement of the structure of the umbrella top and the runner and brace rods for moving the top to extended operative position and collapsed position, as with other umbrellas of this type and kind employing the flexible fabric or other top constructions, no detail of the structure of the rigid sections employed being illustrated in said figure.

The reference character **10** designates the umbrella top as a whole, **11** the post of the umbrella, **12** the runner slidable on the post and actuating more or less conventional top operating brace rods **13**. At the upper

end of the post is fixed a special finishing member **14**, shown in sectional detail in Fig. 2 of the drawing and partially in plan and section in Fig. 3 of the drawing.

The member **14** has, centrally thereof, a depending sleeve receiving the upper end of the post **11** and fixed to the post, as for example by a coupling pin **16**. The member **14** also includes a depending annular ring **17** spaced with respect to the sleeve **15** and the outer surface of the ring has a plurality of circumferentially spaced recesses **18**. The outer surface of the ring also has an annular notch or groove **19** for receiving a coupling wire **20** passed through apertures **21** in the upper end portions of ribs or pivot rods **22** for swingable mounting of the umbrella top **10** from the fully extended position, diagrammatically illustrated in Fig. 1 to a collapsed position. A partial collapsed position is indicated by the dot-dash lines at **10'** in Fig. 1 of the drawing. The member **14** has, on its undersurface outwardly of the ring **17**, an annular recess **23**, in which upper end portions of sections **24** and **25** of the umbrella top **10** are housed and concealed. It will be noted, from a consideration of Fig. 2 of the drawing, that the sections terminate short of the pivot ends of the rods **22**.

At this time, it is well to point out that the umbrella in question is primarily of the type used as beach umbrellas, table-center umbrellas and the like which are subjected to long service and heavy duty. Constructing these umbrellas of various types and kinds of fabrics has been unsatisfactory from the standpoint of destruction or breakdown in the fabric tops of the umbrellas; whereas, the frame structures of the umbrellas have, as a rule, been sufficiently strong to render a much greater service. By providing a multiplicity of rigid sections or pairs of sections, as at **24**, **25**, of a light material such, for example, as sheet aluminum, an umbrella can be constructed which will provide more or less indefinite life use and still collapsible for shipment, handling and/or storage.

As stated above, the top **10** is composed of a multiplicity of the pairs of sections **24**, **25**. For example, in Fig. 4 of the drawing two complete sections **24**, **25** are shown and portions of adjacent sections are indicated. One side edge of the section **24** has a semicircular hinge or bearing portion **26** and at the other side edge is a substantially circumferentially continuous, but open, hinge or bearing **27**. In contrast, each section **25** has, at one end, a hinge or bearing **28**, generally similar to the hinge or bearing **27** and adapted to operate within **27** in collapsing the umbrella. In this connection, it will be understood that the bearing **28** extends outwardly with respect tothe outer surface of the section **25**; whereas, the bearing **27** extends inwardly with respect to the inner surface of the section **24**. Thus, in collapsing the umbrella, both of the bearings **27** and **28** will move outwardly in the direction of the arrow **10'** as adjacent rods **22** move together in the direction of the arrows **10''**, as indicated in Fig. 4, so that, when the umbrella is collapsed, there will be a plurality of circumferentially spaced more or less long V-shaped portions extending from the central post portion **11** of the umbrella. Each of these V-shaped extensions comprise the pair of sections **24**, **25**.

The other end of each section **25** has an outwardly extending circular hinge or bearing **29** which snugly but freely receives the pivot rod **22**, as clearly noted at the outer sides of Fig. 4 of the drawing. The illustration in Fig. 4 is somewhat diagrammatic in showing decided clearances between the interfitting and inter-operating hinge or bearing portions, but this is simply to more clearly illustrate the structure. The hinge engagement will be free with reasonable clearances but will not be widely spaced in accordance with the illustration.

From the foregoing description of Fig. 4 of the drawing, it will appear that the rods **22** are arranged in one side portion of each of the sections **25**. The side portions of each of the sections **24**, **25** are contracted near the member **14** and flare outwardly toward the peripheral edge of the umbrella top, as is indicated in Fig. 3 of the drawing and diagrammatically illustrated in Fig. 1.

In connection with Fig. 3 of the drawing, it will appear that no attempt has been made to clearly illustrate the contour of the adjacent sections **24**, **25**, as it is believed to be simpler to identify the positions of the sections and to rely on the showing in Fig. 4 to clearly note the cross-sectional contour of the sections.

The outer ends of the rods **22** are forked, as seen at **22'** in Fig. 6 of the drawing, to receive tongue ends **13'** on the operating and brace rods **13**, the tongue ends being pivoted in the forks **22'**, as indicated by the pivot pin **30**. From the diagrammatic showing of Fig. 1, it will appear that the rods or ribs **22** extend radially a distance materially less than the full radial spread of the umbrella top **10**. For assemblage of the rods **22**, the hinge or bearing portions **29** of the sections **25** are cutaway from a point inwardly of and adjacent the outer ends of the rods **22**, when in operative position, for a length sufficient to freely assemble the rods and these cutaway portions are diagrammatically illustrated at **29'** in Fig. 5 of the drawing and are also indicated in Fig. 2 of the drawing.

It will, thus, appear that, by swinging the sections **25** into the position indicated diagrammatically in dotted lines in Fig. 5, the rods **22** can be freely placed in position and then moved inwardly into the hinge or bearing portions **29** and then coupled with the pivot wire or strand **20**.

It will also appear, from a consideration of Figs. 2 and 6, that the cutaway portions **29'** are also apertured, as at **29''**, for reception and movement of the upper ends of the brace rods **13** as these rods swing from the fully extended position to the collapsed position of the top **10**. In this connection, it is pointed out that, in Figs. 5 and 6, no attempt is made to show any of the background showing in order to more clearly portray the sections at the point where the sections are taken.

With my improved umbrella construction, it will appear that the umbrella ribs extend only a short radial length on the umbrella top. However, the top is self-sustaining by virtue of the interfitting hinge portions of the sections which actually produce reinforcing ribs arranged radially on the umbrella, these ribs being continuous except for the cutaway portions, as at **29'**, which represent a relatively short length substantially centrally of the spread of the umbrella top. From a standpoint of ornamentation, the different sections **24**, **25** can be of one color or of contrasting colors and this would apply to both inner and outer surfaces of the umbrella top.

Many umbrellas of the large type here under consideration employ mechanical or power operations of the runner, but these features of the structure are not dealt with, as it forms no direct part of the present invention. In fact, by virtue of the self-sustaining characteristics of the umbrella top, various means can be employed for movement of the umbrella top into the extended operative position and collapsed position. In other words, in the adaptation of the invention illustrated, by way of example, the short rods **22** are employed simply as a means for pivotally coupling the umbrella top to the member **14**. It will also be apparent that the shaping of the hinge or bearing portions of the respective sections are such as to facilitate operation of these sections by swinging movement one with respect to the other. However, when assembled in forming the complete top, they become definitely interlocked.

It is also pointed out that, in the collapsing or closure of the umbrella top, the free ends of the hinge portions **26** extend into clearances or channels **31** formed in the hinge portions **29**, as noted in Fig. 4 of the drawing; whereas, the hinge portions **27** and **28** ride one within the other.

The bearings **26—29** and **27—28** may be said to be journaled together and that the ribs **22** are journaled in selected bearings, as at **29**, Fig. 4. Further, the sections **24—25** may be said to have wide outer ends and narrow upper or inner ends, thus producing the desired contour to the umbrella top when the pairs of sections are coupled together.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An umbrella of the character described, comprising a post, a top member at the upper portion of the post, a runner slidably engaging the post, an umbrella top, means between the runner and umbrella top for movement of the umbrella top into extended and collapsed positions with respect to the post, said top comprising a plurality of joined pairs of rigid sections, the section in each pair being different to adapt the pairs of sections to be united in a circumferentially continuous umbrella top comprising only said pairs of joined sections, each section having materially spaced and tapered longitudinal edges, said edges including integral bearing means for coupling the edges of adjacent sections to form a top having a continuous surface, said bearing means hingedly journaling the sections in each pair and said pairs of adjacent sections, and means pivotally coupling predetermined sections of the umbrella top with said member so that the umbrella top can be moved into extended and collapsed positions.

2. A structure as defined in claim 1, wherein the periphery of said member overlies upper adjacent edge portions of the sections of the umbrella top.

3. A structure as defined in claim 1, wherein the means for pivotally coupling the umbrella top with said member comprises ribs having a pivot mounting in said member and journaled in selected bearing means of said sections.

4. A structure as defined in claim 3, wherein said ribs extend a limited radial length of the umbrella top, and said first named means include brace rods pivoted to outer end portions of said ribs.

5. A structure as defined in claim 4, wherein the bearing means of the sections journaling said ribs are apertured to provide clearance for swinging movement of the brace rods in movement of the umbrella top from extended to collapsed positions.

6. A structure as defined in claim 5, wherein the bearing means of the sections supporting said ribs include elongated cutaway portions for mounting of the said ribs in said bearing means.

7. An umbrella of the class described, employing a post, an umbrella top fashioned from relatively movable pairs of independent rigid sections having materially spaced and tapered longitudinal side edges, the side edges of said sections having integral bearing means journaling sections of each pair and one pair of sections with adjacent pairs of sections to form a top having a continuous surface, the journaling of said sections forming a complete closure for the umbrella top when in open position, means for actuating the umbrella top in movement of the same into collapsed and extended positions, said last named means comprising circumferentially spaced ribs journaled with bearing means of selected sections, a runner slidably engaging the post, and brace rods pivoted to the runner and pivotally coupled to said ribs.

8. A structure as defined in claim 7, wherein the upper end of the post includes a member overlying upper ends of said sections, and means pivotally coupling the upper ends of said ribs with said member.

9. In umbrellas of the character described, an umbrella top comprising a plurality of independent rigid sections having materially spaced and tapered longitudi-

nal side edges, said side edges of adjacent sections having integral bearing means, the bearing means at side edges of adjacent sections being different to adapt pairs of sections for journaling in forming a circumferentially continuous complete enclosure for the umbrella top, said top comprising only said pairs of journaled sections, said pairs of sections providing movement of the umbrella top into extended and collapsed positions, the tapering of the side edges of the sections defining wide outer ends and narrow inner ends, and supporting ribs journaled in circumferentially spaced bearing means of said sections.

10. A structure as defined in claim 9, wherein inner surfaces of the sections of each pair collapse toward each other in movement of the umbrella top into collapsed position.

11. A structure as defined in claim 9, wherein said ribs have ends protruding beyond the narrow ends of said sections, and means for pivotally supporting and housing said protruding rib ends.

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