United States Patent

Houston

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[45] **Sept. 19, 1972**

[54] **FOLDABLE UMBRELLA**

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[52] **U.S. Cl.** **135/25**

[51] **Int. Cl.** **A45b 19/00**

[58] **Field of Search** ..... 135/2, 16, 20, 19, 5, 25, 26, 135/33, 34; 52/583; 160/231; 16/150, DIG. 13

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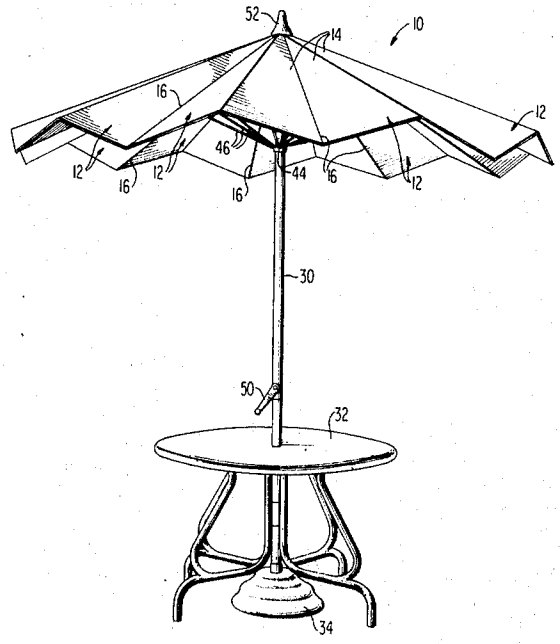
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[57] **ABSTRACT**

A foldable umbrella comprising a plurality of substantially rigid umbrella sections, each of which is tapered inwardly toward the center of the umbrella and is positioned with respect to the other sections to collectively define the umbrella. A plurality of flexible elongated strips are connected to the side edge portions of the umbrella sections and extend throughout substantially the entire length thereof. Preferably, the strips are slidably connected to the umbrella sections so as to be removable and replaceable. Each of the strips serves as a hinge for adjacent umbrella sections so that they are foldable with respect to each other when the umbrella is closed.

10 Claims, 8 Drawing Figures



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SHEET 1 OF 2

FIG. 1

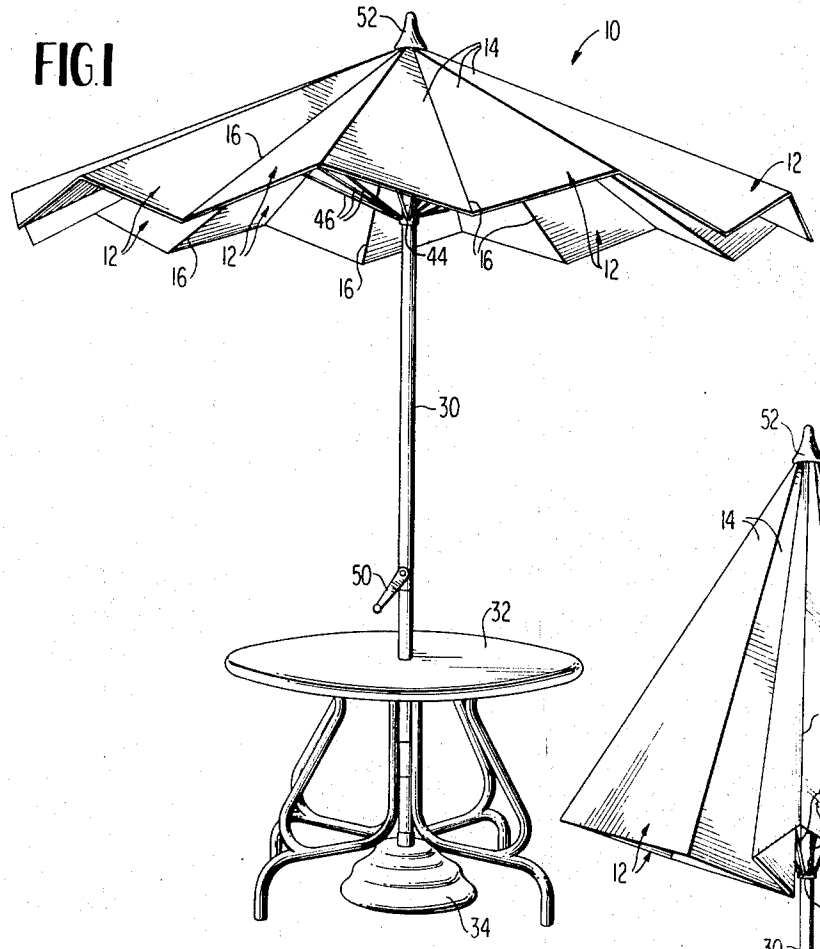


FIG. 2

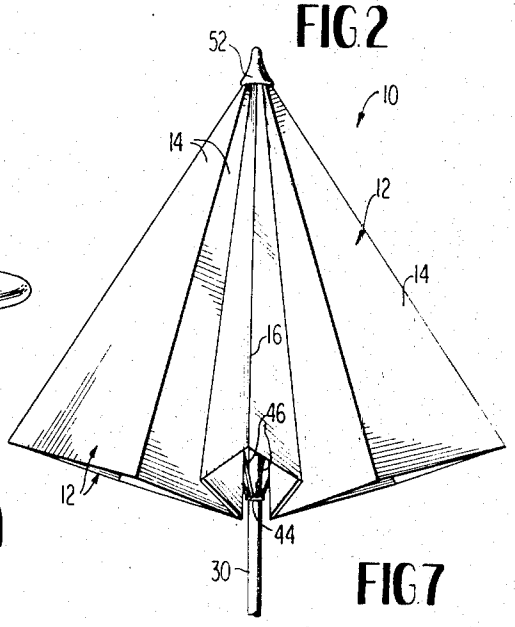


FIG. 7

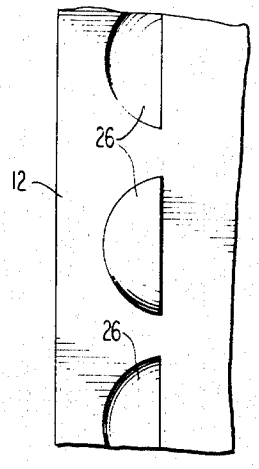


FIG. 6

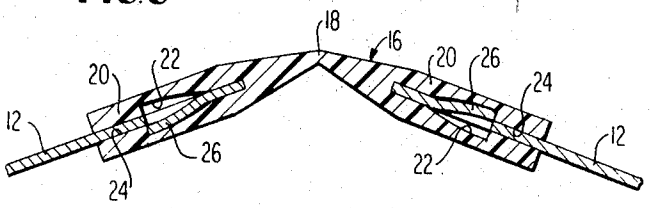
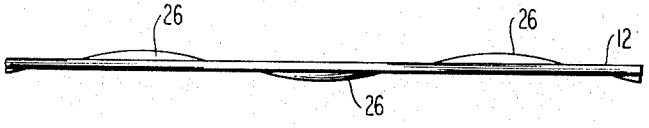


FIG. 8



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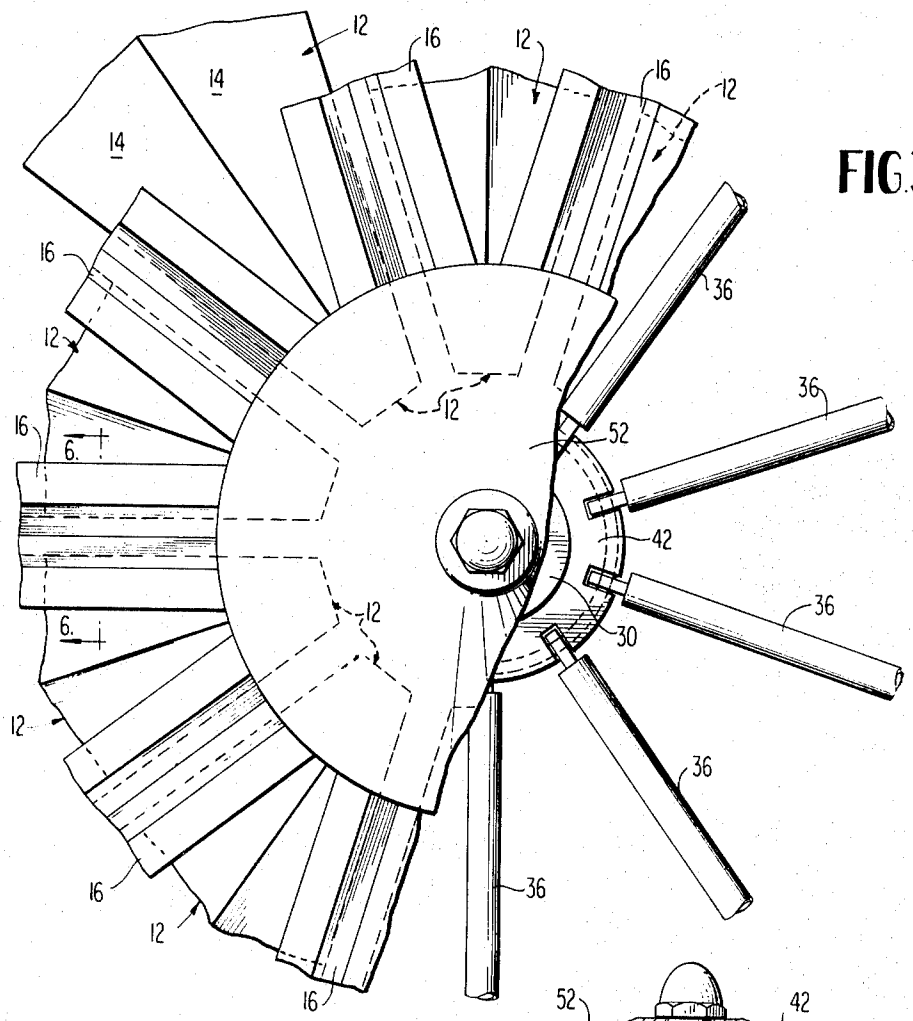


FIG.3

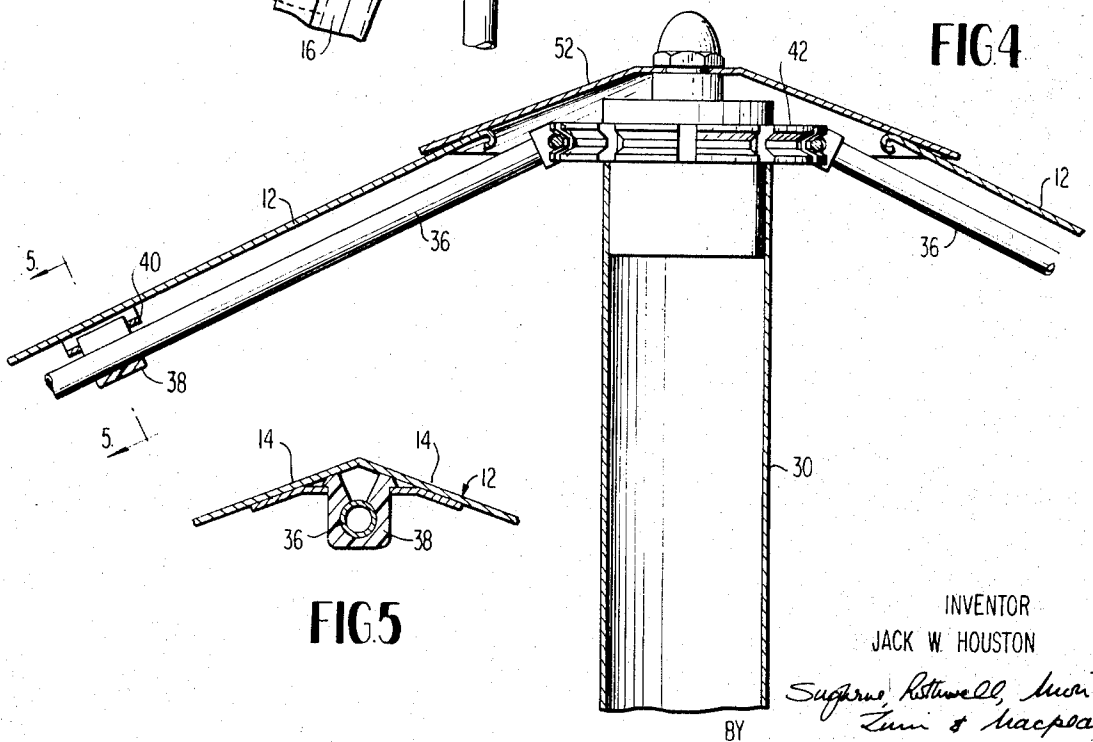


FIG.4

FIG.5

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FOLDABLE UMBRELLA

BACKGROUND OF THE INVENTION

This invention relates to a foldable umbrella and, more particularly, to a foldable lawn-type umbrella having a plurality of substantially rigid umbrella sections that are hingedly connected by flexible strips such that the umbrella sections can be folded with respect to each other to enable the umbrella to be closed.

Heretofore, two types of lawn umbrellas have been primarily utilized. The first type is a foldable umbrella utilizing a canvas or vinyl-type fabric for the umbrella. While this type of umbrella has generally satisfactorily served its purpose, it has been subject to numerous disadvantages. The fabric of such umbrellas is subject to damage or deterioration by exposure to the elements, and thus has only a limited life of approximately a few years. When the fabric is damaged or becomes deteriorated, it cannot be replaced, with the result that all of the other components of the umbrella assembly are rendered useless and a new umbrella must be purchased. Also, such fabric-type lawn umbrellas have been subject to fading after a short period of exposure to the elements and, thus tend to lose their attractive appearance after a short period of use.

The second type of lawn umbrella that has been utilized is one that is formed with a rigid cover made out of a material such as aluminum, fiberglass or the like. While this type of lawn umbrella is durable, it cannot be folded and is thus subject to the disadvantages of being extremely difficult to handle and to store in view of its weight and bulk. Also, it is subject to being severely damaged if it is exposed to winds of high velocity during a storm or the like, since it cannot be folded.

A common disadvantage of both of the above types of lawn umbrellas is that they must be manufactured at the factory and, thus shipped in finally assembled form, with the resultant disadvantage that a large amount of shipping space is occupied by these umbrellas, particularly the type having the rigid cover that cannot be folded.

SUMMARY OF THE INVENTION

Accordingly, a need has arisen for a lawn-type umbrella having all the advantages of the previously utilized foldable and rigid umbrellas, and which is not subject to any of the disadvantages of the previously used umbrellas. The foldable umbrella of the present invention clearly fulfills this need.

The foldable umbrella of the present invention comprises a plurality of substantially rigid umbrella sections which may be formed of any suitable material, such as aluminum, fiberglass or the like. Each of the sections are tapered inwardly toward the center of the umbrella and are so positioned with respect to the other sections to collectively define the umbrella. Adjacent umbrella sections are hingedly connected by elongated flexible strips that are preferably formed of a plastic material and extend throughout substantially the entire length of the sections. Preferably, the flexible strips are slidably connected to the adjacent umbrella sections so as to be easily removed therefrom and replaced. An opening and closing assembly is connected to the umbrella sections such that when the umbrella is closed, the sections will fold with respect to each other about the flexible hinge strips.

Since the umbrella of the present invention is formed of sections of aluminum, fiberglass or the like, it is far more durable than the previously used canvas type foldable umbrellas. Should the flexible hinge strips become damaged or faded, or should it be desired to change the color of the strips, they may be easily removed from the adjacent umbrella sections and replaced by new strips of the same or different color. Further, the construction of the foldable lawn umbrella of the present invention is such that it may be shipped in unassembled form and easily assembled by the retailer or purchaser, thereby reducing substantially the shipping costs required for the previously used lawn umbrellas.

It will be readily seen, therefore, that the lawn-type umbrella of the present invention can be easily shipped and stored, is relatively lightweight, is very durable, and can be easily repaired if the flexible hinge strips are damaged or become discolored.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a foldable umbrella constructed in accordance with the principles of the present invention, the umbrella being shown in an open position and supported by a lawn table;

FIG. **2** is a perspective view of the umbrella shown in FIG. **1**, showing the umbrella in a closed or folded condition;

FIG. **3** is an enlarged plan view, with parts broken away, of a part of the upper portion of the umbrella of this invention;

FIG. **4** is an elevational view, with parts broken away and parts shown in section of a part of the upper portion of the umbrella of this invention;

FIG. **5** is a sectional view taken substantially along line **5—5** in FIG. **4**;

FIG. **6** is an enlarged sectional view taken substantially along line **606** in FIG. **3**;

FIG. **7** is an enlarged plan view of the side edge portion of an umbrella section; and

FIG. **8** is a side elevational view of the side edge portion of an umbrella section.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIG. **1**, the foldable umbrella **10** of the present invention generally comprises a plurality of substantially rigid umbrella sections **12**, each of which is tapered inwardly toward the center of the umbrella and is positioned with respect to the other sections to collectively define the cover for the umbrella. The adjacent side edge portions of each of the umbrella sections **12** are hingedly connected in a manner to be described hereinafter, so that the sections **12** can fold with respect to each other when the umbrella is closed, as shown in FIG. **2**.

Each of the umbrella sections **12** preferably is substantially V-shaped in transverse cross section and comprises a pair of upwardly and inwardly inclined portions **14** that intersect substantially at the center portion of the section. This construction of the umbrella sections **12** provides a pleasing carrousel effect when the umbrella is opened, facilitates the opening and closing of the umbrella, and facilitates the connection of the actuating mechanism to the umbrella sections, in a manner to be described hereinafter. It is noted, how-

ever, that the umbrellas sections could be formed of flat panels disposed in a single plane, or could be of any other suitable cross sectional shape or construction within the scope of this invention.

The umbrella sections **12** preferably are formed of a lightweight, substantially rigid material, such as aluminum or fiberglass. They could be formed of any other suitable material within the scope of this invention. The sections **12** are hingedly connected at their adjacent side edge portions by a plurality of flexible elongated hinge strips **16**, each of which is connected to the side edge portions of adjacent umbrella sections **12** and extends throughout substantially the entire length thereof.

As shown in FIG. **6**, each of the hinge strips is formed of a suitable flexible material, preferably a plastic material such as polyethylene or polyproplyene, and is provided with a narrow longitudinally extending center hinge portion **18** about which the side portions **20** of the strip are adapted to pivot. Each side strip portion **20** has a longitudinally extending internal opening **22** and a narrow longitudinal slot **24** extending from the opening **22** to the outer end of the side portion **20**. Each opening **22** and corresponding slot **24** is adapted to slidably receive therein the side edge portion of an umbrella section **12**.

As an illustrative example, the side edge portion of each of the umbrella sections **12** may be provided with a plurality of longitudinally spaced tabs **26** extending in alternating fashion from opposite surfaces thereof, in the manner shown in FIGS. **7** and **8**. The tabs **26** preferably have a shape that is complementary with that of the inner surface of the longitudinal openings **22** in the hinge strips **16** so as to be easily slidably received therein, as shown in FIG. **6**. The ends of the tabs **26** serve to engage the adjacent inner surface of the strip **16** defining the respective opening **22**, thereby preventing the umbrella sections **12** from being laterally removed from the hinge strips **16**.

From the foregoing description, it will be readily seen that the hinge strips **16** are slidably connected to the adjacent umbrella sections **12**, and thus can be easily removed therefrom and replaced when damaged, by merely sliding the strips longitudinally outwardly in a radial direction from the umbrella sections, and replacing one or more of them with a new strip. The strips can also be readily removed and replaced if it is desired to change their color or design, thereby enhancing the aesthetic effects that may be created by the umbrella.

Within the scope of the present invention, the flexible hinge strips **16** may be of any suitable construction, other than that shown in the drawing, the only requirement being that they must be sufficiently flexible to allow the umbrella sections to fold with respect to each other in the manner shown in FIG. **2**. Also, the hinge strips **16** may be connected to the side edge portions of the umbrella sections **12** in any suitable manner other than that shown in the drawings. For example, the hinge strips **16** could be slidably connected to the umbrella sections in many other ways, or could be fixedly connected to the umbrellas sections in any suitable manner, such as by a suitable adhesive or by crimping, extruding or the like. The hinge strips could also be formed of a suitable flexible metal and spot-welded or otherwise connected to the umbrella sections.

The umbrella cover, defined by the umbrella sections **12** and hinge strips **16**, can be supported in any suitable or conventional manner on a center support post **30**, which in turn, may be supported by an umbrellas table **32** and anchored by a suitable base **34**, of the types shown in FIG. **1**. As an illustrative example, each of the umbrella sections **12** may be supported by a radially extending rib **36** disposed beneath the center portion of the umbrella section, and secured to the umbrella section in any suitable manner. As shown in FIGS. **4** and **5**, each of the ribs **36** may be connected to its respective umbrella section **12** by one or more retainer members **38** that surround the rib and are adapted to be lockingly engaged with a bracket **40** that is secured, by riveting, welding or the like, to the adjacent portions of the umbrella section on each side of the center portion thereof. Any other suitable means could be used for securing the supporting ribs **36** to the umbrella sections **12**.

Each of the supporting ribs **36** is pivotally connected at its inner end to a collar **42** secured to the center post **30**, in the manner shown in FIGS. **3** and **4**. Within the scope of this invention, the ribs **36** may be pivotally connected to the support post **30** in any other suitable manner.

As shown in FIGS. **1** and **2**, a plurality of actuating rods **44** are pivotally connected at their inner ends to a sleeve member **46** slidably mounted on the support post **30**, and are pivotally connected at their outer ends to the rods **36**. The ribs **36**, rods **46** and collar **44** serve to support the umbrella sections **12** in their open and closed positions, and may be connected to any suitable type of actuating mechanism for effecting opening for closing movement of the umbrella sections and connected hinge strips **16**. For example, a hand crank **50** may be rotatably supported on the center post **30** for the purpose of enabling the actuating mechanism to be manually operated for the opening and closing of the umbrella. It is to be understood, however, that any suitable or conventional umbrella supporting and actuating mechanism, other than that disclosed herein, may be utilized within the scope of the present invention.

As shown in FIGS. **3** and **4**, the inner ends of the umbrella sections **12** terminate at a short distance from the center post **30** for the purpose of facilitating the opening and closing movement of the umbrellas sections. In order to cover the space between the umbrella sections **12** and the center post **30**, a cap member **52** may be secured to the upper end of the support post **30** to cover the space between the inner end portions of the umbrella sections **12** and the post.

In view of the simple construction of the umbrella of the present invention, it is capable of being shipped in unassembled form and easily assembled by a retailer or purchaser, thereby substantially reducing the costs of shipping the umbrella. Also, since the umbrella is formed of substantially rigid sections of durable material, such as aluminum or fiberglass, it will withstand substantially greater wear than other types of foldable lawn umbrellas having flexible material covers. Also, as hereinbefore mentioned, should the flexible hinge strips connecting the umbrella sections become damaged or faded, or should it be desired to change the color of the strips, they may be easily slidably removed

from the umbrella sections and replaced by new strips of the same or different color.

It will be readily seen, therefore, that the umbrella of the present invention is relatively lightweight, very durable, can be easily shipped and stored, and can be easily repaired if the flexible hinge strips are damaged or become discolored.

I claim:

1. A foldable umbrella, comprising:

a plurality of substantially rigid umbrella sections, each of said sections being tapered inwardly toward the center of the umbrella and being so positioned with respect to the other sections to collectively define the umbrella,

means for hingedly connecting adjacent umbrella sections, said connecting means comprising a plurality of flexible elongated hinge strips, each slidably connected to the side edge portions of adjacent umbrella sections so as to be removable and replaceable by longitudinal movement thereof relative to said sections, each of said strips extending throughout substantially the entire length of the side edge portions of adjacent umbrella sections,

means to prevent removal of each strip from said sections in a direction substantially perpendicular to the longitudinal axis of said strip, and

means connected to said umbrella sections for opening and closing said umbrella, whereby when said umbrella is closed said sections fold with respect to each other about said flexible strips.

2. The umbrella of claim 1 wherein each of said strips is formed of a plastic material and has an elongated thin hinge portion extending substantially along the center portion thereof.

3. The umbrella of claim 2 wherein said umbrella sections are formed of a lightweight metal.

4. The umbrella of claim 2 wherein each of said strips comprises an internal elongated opening at each side edge portion thereof which is adapted to retainably receive the side edge portion of the adjacent one of said umbrella sections.

5. The umbrella of claim 4 wherein the side edge portion of each of said umbrella sections comprises a tab that is adapted to be received and retained within the internal opening in the adjacent one of said strips.

6. The umbrella of claim 4 wherein the side edge portion of each of said umbrella sections comprises a plurality of tabs extending from opposite thereof, said tabs being adapted to be received and retained within the internal opening in the adjacent one of said strips.

7. The umbrella of claim 1 wherein said opening and closing means comprises an elongated rib connected to each of said umbrella sections and a rod pivotally connected to each of said ribs.

8. The umbrella of claim 7 wherein said umbrella further comprises a center support post, said ribs being pivotally connected at their inner ends to said post, and a sleeve slidably mounted on said post, said rods being pivotally connected at their inner ends to said sleeve.

9. The umbrella of claim 7 wherein each umbrella section comprises a pair of oblique portions which extend upwardly and inwardly and intersect substantially at the center portion of said section, whereby each section is substantially V-shaped in transverse cross section.

10. The umbrella of claim 9 wherein a bracket is secured to the inner surface of the oblique portions of each section, and clips are adapted to be connected to said brackets, said clips being adapted to receive said ribs and to connect them to said sections.

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