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Weber

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[54] **COLLAPSIBLE UMBRELLA**

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[52] **U.S. Cl.** ..... **135/20 R**

[51] **Int. Cl.** **A45b 19/04**

[58] **Field of Search** 135/20, 26, 25

[56] **References Cited**

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[57] **ABSTRACT**

An umbrella having a telescopic stick and each dome rib has three telescopic sections and a parallelogram support structure including a foldable stretcher member hinged midway thereof connected to the dome ribs and to a fixed pivot point on the stick spaced from the crown. A strut member is pivoted to the stretcher members and is hinged to a movable runner on the stick.

4 Claims, 3 Drawing Figures

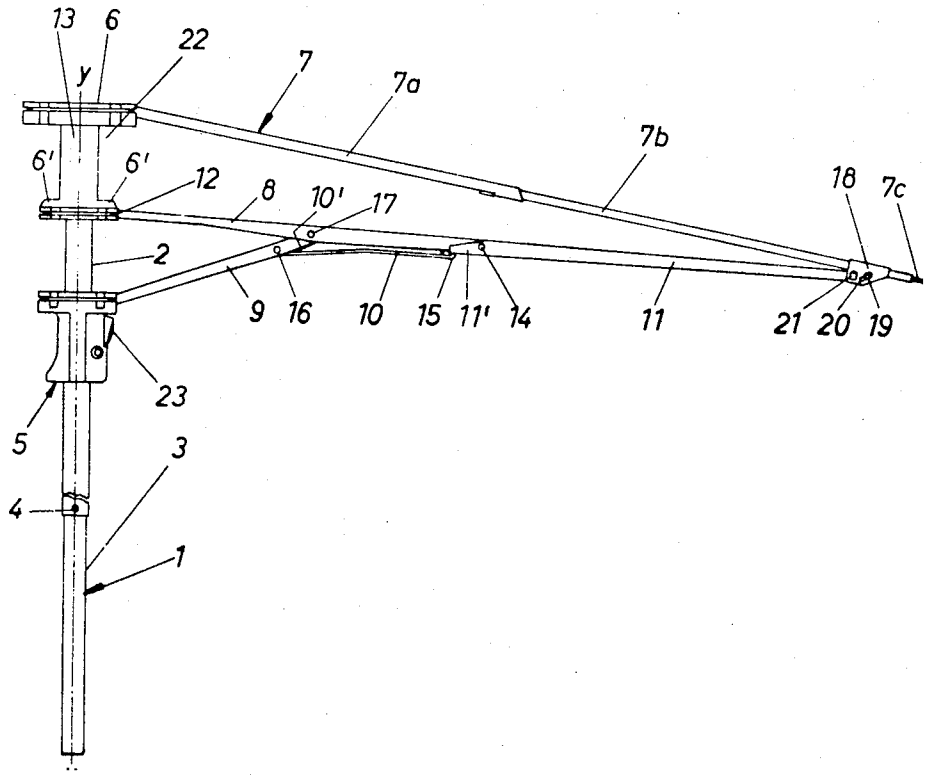


FIG. 1

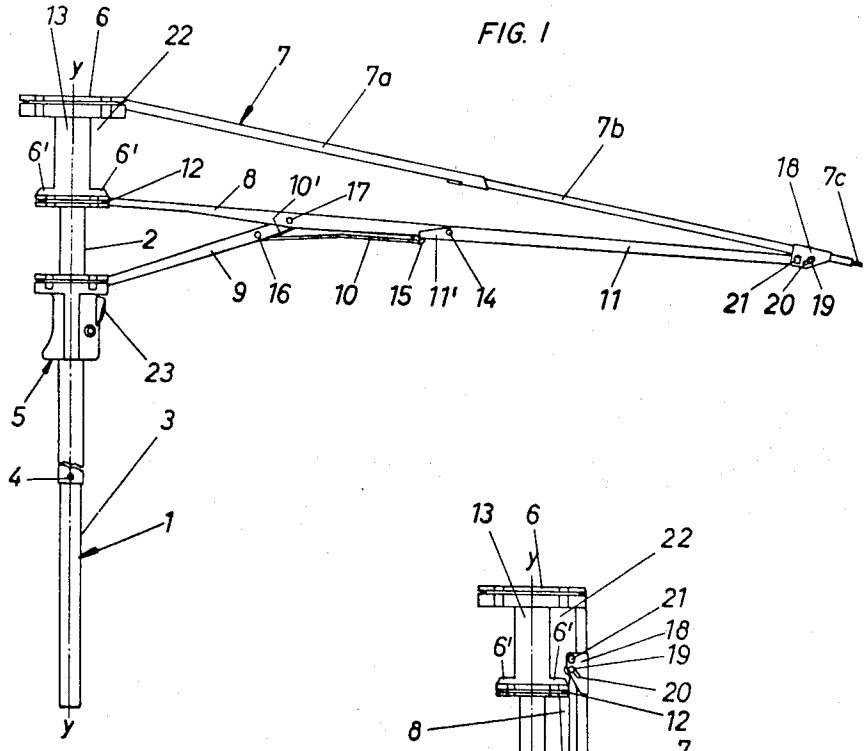
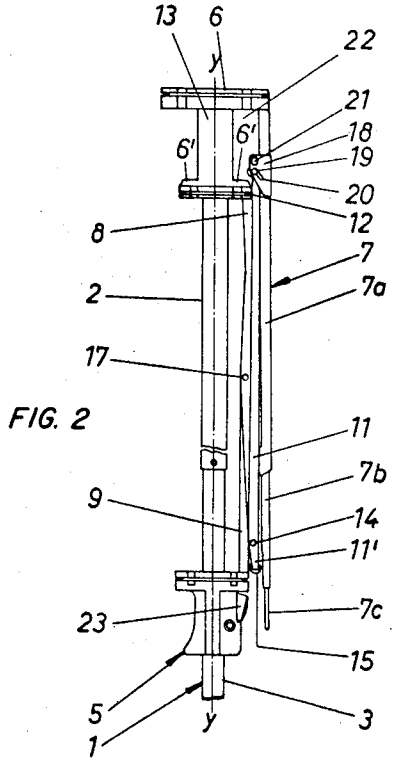

13
6
22
y
7
7a
7b
6'
6'
12
8
10'
17
18
7c
2
9
16
10
15
11'
14
11
21
20
19
23
5
3
4
1
y

FIG. 2


13
6
22
y
21
6'
6'
18
19
20
12
8
7
2
7a
17
11
7b
9
14
11'
7c
23
15
5
3
y
1

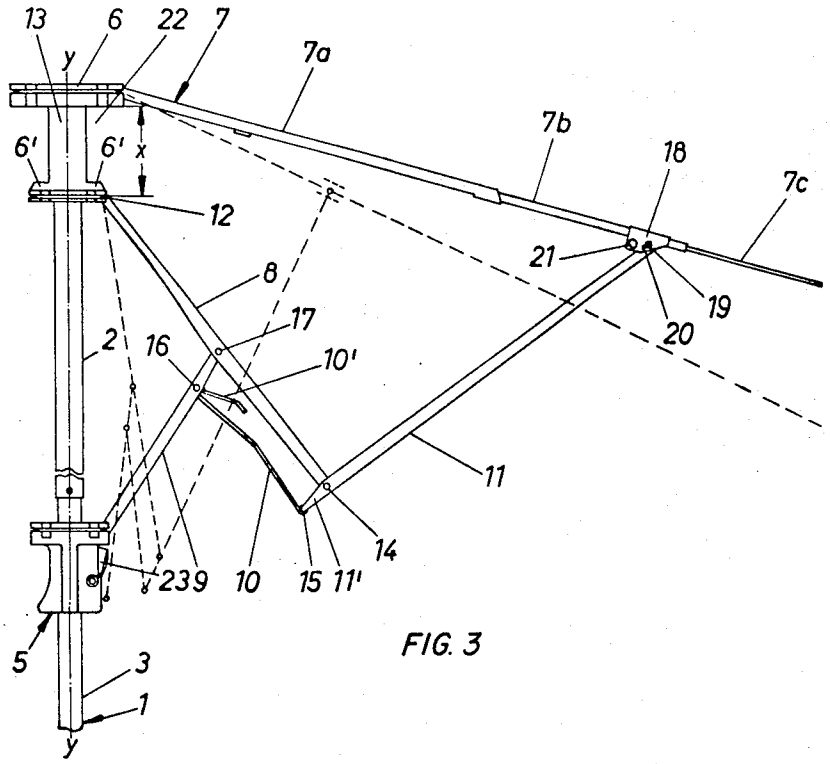

13
6
22
7
7a
y
6'
6'
x
7b
18
7c
12
21
8
19
17
20
2
16
10'
11
14
239
10
15
11'
5
3
1
y

FIG. 3

COLLAPSIBLE UMBRELLA

BACKGROUND OF INVENTION

1. Field of Invention

The present invention relates to an umbrella and particularly to an umbrella having at least three telescopic dome rib sections hinged to a crown and a telescopic stick.

2. DESCRIPTION OF PRIOR ART

In the development of the telescopic umbrella, the aim has been to provide an umbrella which when opened to its fully extended position is as large as conventional umbrellas, but when it is collapsed, it must form the smallest possible package for storage in a lady's purse or in a man's coat pocket.

Recently, an umbrella has been developed which has three telescopic dome rib sections as opposed to the two dome rib sections in a conventional telescopic umbrella, and a unique support structure has been developed wherein a stretcher member is foldable at about its mid-point and hinged at one end to a geats connected to the outer dome rib section and at the other end to an auxiliary runner slidable on the stock. A strut member is hinged to a main runner on the stick and to a pivot point midway of the section of the stretcher members hinged to the auxiliary runner. Finally, to complete the parallelogram structure, a linking member is provided between an extension of the other stretcher section and the strut member at a pivot point spaced from the pivot point of the strut member to the first stretcher section.

Such an umbrella has been found to form a very short and compact package when it is stored and when it is open it provides a suitably large diameter cover. Such an umbrella is considered to be the ultimate in the above-mentioned aims at this stage in the development of the umbrella art. However, the above-described umbrella has many moving parts and is relatively expensive to manufacture.

SUMMARY OF INVENTION

It is an aim of the present invention to simplify the design of the so-called three stage umbrella, as described above, by reducing the number of moving parts, and thereby reducing the cost of manufacturing the umbrella.

In accordance with the present invention, an umbrella construction includes a telescopic stick, a crown fixed at one end of the stick, dome ribs hinged to the crown, and each dome rib has three telescopic sections. Stretcher means are hinged at one end to an outer dome rib section and at the other end to a fixed pivot point on the stick spaced from the crown. The stretcher means is foldable midway thereof. A sliding runner is provided on the stick, and a strut member is hinged to the sliding runner and to the section of the stretcher member hinged to the stick. The stretcher section hinged to the dome ribs includes an extension beyond the pivot point of the folding stretcher sections and link means are provided between the strut and the extension of the stretcher section forming a parallelogram linkage therewith.

A further feature of the present invention is to provide a flange on the stick mounting the pivot points of the stretcher members wherein the distance of the pivot points to the flange from the center line of the stick is less than the distance of the hinge points of the dome ribs to the crown from the center line of the stick, such that when the umbrella is folded, the dome ribs do not take up more volume than that defined by the periphery of the crown.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus generally described the nature of the invention, reference will now be made to the accompanying drawings, showing by way of illustration, a preferred embodiment thereof, and in which:

FIG. **1** is a fragmentary elevational view of an umbrella frame showing the dome ribs in the fully extended position;

FIG. **2** is a fragmentary elevational view of the umbrella similar to FIG. **1**, but showing the dome ribs and supporting structure in a collapsed position; and

FIG. **3** is a fragmentary elevational view of the umbrella frame similar to FIGS. **1** and **2**, but showing the dome ribs and supporting structure in a position midway between its closed position and its open position.

DESCRIPTION OF PREFERRED EMBODIMENT

The umbrella shown in the drawings includes a telescopic stick **1** comprising telescopic tubular sections **2** and **3** and a third tubular section (not shown) which normally mounts a handle and which telescopes in the tubular section **3.** The stick is locked in its fully extended position by a conventional ball and spring catch **4.**

There is a main runner **5** which slides on the stick.

At the free end of the tubular section **2,** there is fixed a crown **6** to which the dome ribs **7** are hinged. Each dome rib **7** comprises three telescopic sections, including an inner section *7a*, hinged to the crown; a central section *7b*, telescopic within the inner section *7a;* and an outer section *7c*, telescopic within the central section *7b*. Sections *7a* and *7b* are of U-shaped cross section, while *7c* is made out of circular wire form.

The support structure for supporting the dome ribs **7** includes a stretcher member comprising stretcher sections **8** and **11** pivotable at **14** to fold one on the other. A strut **9** is pivoted at **17** to the stretcher section **8** and at its other end to the main runner **5** slidable on the stock. The stretcher section **8** is hinged at a pivot point **18** on a flange **6'** integral with tbe sleeve **13** which, in turn, is integral with the crown **6.** The flange **6'** is spaced a distance "*x*" from the crown **6.**

The stretcher section **11** has an extension **11'** beyond the pivot point **14** to which a link member **10** is hinged about the pivot point **15** at one end and to the pivot point **16** on the strut **9.** The link **10,** strut **9,** stretcher section **8** and extension **11'** form a parallelogram for opening and closing the three stage dome rib **7.** The link **10** includes an extension **10'** which acts as a spring as shown in FIGS. **1** and **3** for initiating the opening movement of the support structure when the umbrella is being opened.

The stretcher section **11** is hinged to a geats **18** which is adapted to slide on the dome rib **7.** The dome rib section *7c* passes through an end sleeve of the section *7b* and is connected to the hinge pin **19** in the geats **18.** An aperture **21** is provided in the geats **18** for anchoring the cover-retaining thread when the cover is mounted on the frame.

In operation, when it is required to open the umbrella to a position as shown in FIG. **1** from a position as shown in FIG. **2,** the stick is extended fully by pulling

on the umbrella handle (not shown). The dome ribs in FIG. 2 are released by either detaching a band holding the cover in a closed position or by loosening one's fingers from about the dome ribs whereby the spring extensions **10'** force the parallelogram linkage to open slightly away from the umbrella stick **1**, assuming a position somewhat as shown in dotted lines in FIG. **3**. The spreading action causes hinge pins **17** to move radially away from the umbrella stick, thus moving the struts and stretcher sections away from the dead-center position. Only a relatively small force need be applied to the main runner **5** to move it towards the crown **6**. This movement of the runner **5** spreads the support system causing the dome ribs to pivot upwardly and to simultaneously extend under the force of the parallelogram support structure wherein the link member **10** is acting under tension.

Once the runner has reached a position as shown in FIG. **1**, the lock lever **23** engages an aperture in the stick, thereby locking the runner in position. When it is required to close the umbrella, the locking lever **23** is released by depressing it and the main runner is moved towards the handle end of the umbrella stick.

Once the support structure and dome ribs pass the position shown in dotted lines in FIG. **3**, the link **10** acts in compression to guide the dome rib support stretcher member **11** into a position parallel with the umbrella stick **1** pressing the geats **18**, thus telescoping the dome rib sections **7***b* and **7***c*.

In the formation of the flange **6**, it is evident that it can be a separate piece fixed to the umbrella stick. However, in the present embodiment, it is shown as a molded integral part of the crown **6** and the sleeve **13**, which is forced onto the stick **1**. It has been found that in the present structure where no movable auxiliary runner is provided and the stretcher members **8, 11** are hinged to a fixed flange on the stick **1**, there is a surprising effect in the inherent spreading action of the support system. The stretcher section **8** is, of course, acting as a pivoting lever towards and away from the stick **1** about a fixed pivot point thereby enhancing the action of the stretcher section **11** pressing the geats **18** outwardly to fully extend the dome rib sections **7***b* and **7***c*. In view of the fixed pivot point of the stretcher sections **8**, it is found that the closing operation is made earlier since the support system is folded soon when the umbrella is being closed with the simultaneous telescoping of the dome ribs **7**.

I claim:

1. An umbrella frame having a telescopic stick, a crown at one end of the stick, and dome ribs hinged to the crown; each dome rib comprising at least three telescopic sections, including an inner section hinged to the crown, an intermediate section, and an outer section; a runner slidably mounted on the stick, stretcher means hinged to the stick at a fixed point spaced from the crown and to each outer dome rib section, each stretcher means being foldable at a hinge point; a section of each stretcher means connected to the outer dome rib section having an extension portion beyond the hinge point; strut means hinged to the runner and to the section of each stretcher means hinged to the stick; tension link means connected to the extension of the section of each stretcher means connected to the outer dome rib section, and to the strut member at a point between the connection of the strut member to the stretcher means and the connections of the strut member with the runner; the link means, hinge connections, portions of the strut means and extension portion of the stretcher member connected to the dome rib forming a quadrilateral beneath each stretcher means and being constructed and arranged to apply tension to the link means when the frame is erected.

2. An umbrella frame as defined in claim **1** wherein a flange is fixed to the stick and said first section is pivotally mounted to the flange.

3. An umbrella frame as defined in claim **2** wherein the pivot of the dome ribs to the crown is a greater distance from the axis of the stick than the distance from the pivot of the first stretcher on the flange from the axis of the stick.

4. An umbrella frame as defined in claim **3** wherein the crown is integral with the flange by means of a sleeve fitting on the umbrella stick.

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