

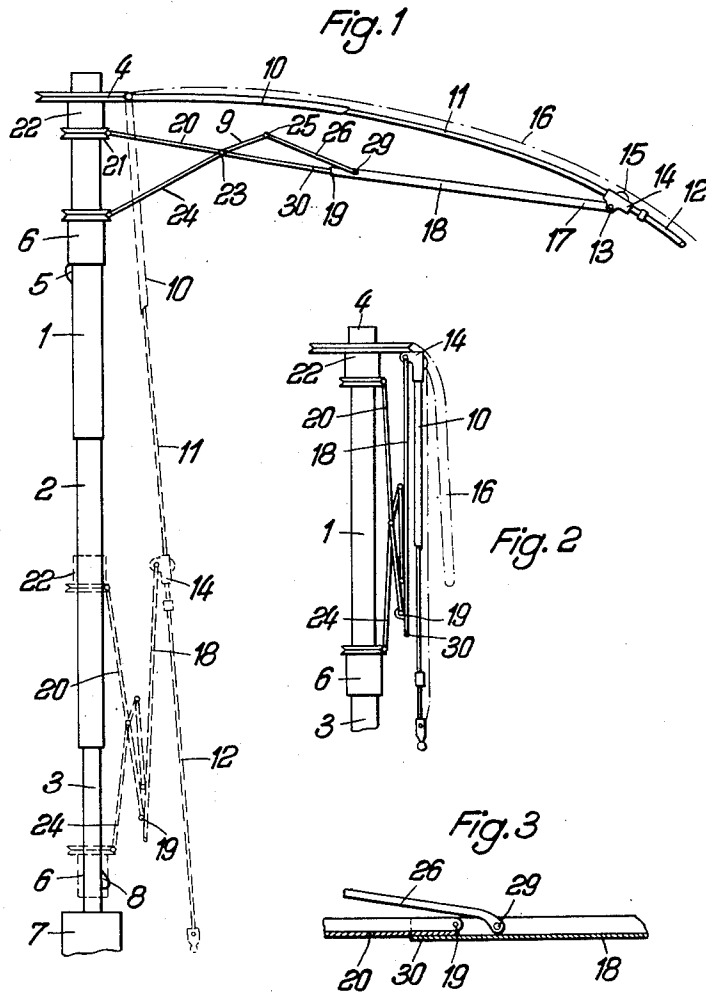
Jan. 1, 1957

H. HAUPT

2,775,977

COLLAPSIBLE UMBRELLA

Filed June 15, 1954



Inventor:
H. Haupt
by
E. J. Freeman
Attorney

1

2,775,977

COLLAPSIBLE UMBRELLA

Hans Haupt, Dusseldorf-Oberkassel, Germany

Application June 15, 1954, Serial No. 436,920

Claims priority, application Germany June 25, 1953

7 Claims. (Cl. 135—26)

The invention relates to umbrellas, and relates more particularly to collapsible umbrellas.

The invention has among its objects to provide a collapsible umbrella that is light in weight and has stable rigidity when opened.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in a construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevational view, partly in section, of the umbrella in accordance with the invention, showing in solid lines the umbrella opened, and in broken lines the closed umbrella;

Fig. 2 is a fragmentary elevational view, partly in section, of the collapsed umbrella;

Fig. 3 is a large scale sectional view of a detail of a spreader.

The umbrella stick is composed of three telescoping sections 1, 2, and 3. The upper stick section 1 carries an umbrella crown 4, and a latch 5 which locks an auxiliary runner 6 when the umbrella is open as shown in solid lines in Fig. 1; the lower stick section 3 carries a handle 7, and a latch 8 which locks the auxiliary runner 6 when the umbrella is closed as shown in broken lines in Fig. 1.

The umbrella ribs consisting of three telescoping rib members 10, 11, 12 are hingedly connected to the umbrella crown 4; the inner rib member 10 is located next to the crown 4 and has the largest width, while the outermost member 12 has the smallest width. The inner end of the outermost member 12 is pivoted to the rib supporting structure by a pin 13, the latter being connected to a guide member 14. This guide member 14 is provided with an eyelet 15 that forms a fastening means for the umbrella cover 16; this eyelet 15 is located with sufficient play above the central rib member 11, and is properly folded during the collapsing of the umbrella, as best shown in Fig. 2.

The rib supporting structure composes a series of spreaders, each having two arms 18 and 20; the free end 17 of the outer arm 18 is pivoted by the pin 13 relative to the rib members 10, 11, 12. The outer arm 18 is pivoted at 19 to the inner arm 20; the latter is pivoted at 21 to a main runner 22.

A brace is provided for each spreader, and each brace has an inner leg 24 that is pivoted to the inner arm 20 at 23, and an outer leg that is pivoted at 25 to the inner leg 24 and pivoted to the outer arm 18 at 29. The inner leg 24 is pivoted to the auxiliary runner 6. The arms 18 and 20 and the legs 24 and 26 complete a polygonal link system of the pantograph type. Accordingly, each change of the angular positioning of the inner arm 20 and inner leg 24 which are supported by the runners

2

22 and 6 on the umbrella stick 1, causes a change of the angular position of the arms 18 and 20 of the spreader.

In conformity with the invention the pivot 29 is located at such a small distance to the joint 19 that at a change of the angle between the inner arm portions 20 and inner leg 24 the change of the angle between the two arms 18 and 20 is greater.

In this manner a guarantee is obtained that when opening the umbrella by the change of distance between the runners 6 and 22, the outer arm 18 of the spreader covers an angle of traverse relative to the inner arm which is larger than the angle between the inner arm 20 and the inner leg 24. An angle of about 180° should be preferably chosen as an angle of rotation of the arms 18 and 29 of the spreader, whereby these arms will form a substantially straight line in the open position of the umbrella. In this manner the outer arm 18 is adapted to take up a great pressure with regard to the support of the umbrella roof; nevertheless a spread may be maintained between the inner arm 20 and the inner leg 24 which guarantees a secure support of the spreaders by the umbrella stick and a reliable assurance that the umbrella will not turn over in the case of strong wind.

The main runner 22 including its pivot 21, and which carries the spreaders is in the opened position of the umbrella advanced towards the umbrella crown 4 beyond the perpendicular dead center position of the spreaders relative to the stick. In this position the spreaders are enabled to pull out the rib members 10, 11, 12 and to secure the same in their proper operative position; moreover, in this manner the structure leaves a large free space underneath the umbrella roof for protection against rain.

When closing the umbrella the outer arm 18 is swung towards the crown 4, as shown in Figure 2. In order to collapse the umbrella the outer rib section 12 may now be led together with the already shortened braces in the direct vicinity of the crown 4 (Fig. 2).

The outer arm 18 is provided with an extension 30 that extends beyond the pivot 19; this extension 30 supports the inner arm 20 when the umbrella is open, and limits the turning of the arms 18 and 20 relative to each other in one direction.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, what I claim as new and desire to be secured by Letters Patent, is as follows:

1. In a collapsible umbrella, having a stick formed of telescoping sections and ribs pivoted to said stick composed of telescoping members and a main runner and an auxiliary runner slidably mounted on said stick, in combination with, a series of spreaders each comprising an inner arm pivoted to said main runner and an outer arm connected to a member of a rib, said arms of each spreader being pivoted to each other and movable to and from an active position of maximum angle between said arms wherein the spreaders spread and ribs to open the umbrella, and a brace for each spreader comprising an inner leg pivoted to said auxiliary runner and pivoted to the inner arm of a spreader, and an outer leg pivoted to said inner leg and to the outer arm of said spreader, said legs and arms completing a polygonal link system of the pantograph type whereby angular movement between said inner leg and said inner arm will move said outer leg and said outer arm opening the spreader towards the active position when the angle between said inner leg and inner arm is reduced, the distance between the pivot

3

of the inner leg and inner arm and the pivot of the inner leg with the outer leg being so arranged relative to the space between the pivot of the outer leg with the outer arm and the pivot of said arms, that movement throughout a certain angle between said inner arm and inner leg will be translated into a movement between said inner arm and outer arm of a larger angle, the parts serving the spreading of the umbrella being shaped and connected with each other in such a manner that in the opened state of the umbrella the outer and the inner arm of the main spreader form a substantially straight line and said main spreader forms with the double-arm auxiliary spreader an acute angle.

2. In an umbrella according to claim 1, the inner end of the main spreader being in the opened state of the umbrella located next to the umbrella crown, said main spreader representing in this position approximately the chord of the bent umbrella ribs.

3. In an umbrella according to claim 1, a handle attached to the lower stick section.

4. In an umbrella according to claim 1, a handle attached to the lower stick section, and means to prevent the auxiliary runner from moving towards the handle when the umbrella is in the open state.

4

5. In an umbrella according to claim 1, the main spreader in the open state of the umbrella forming an acute angle with the portion of the stick which extends from the auxiliary runner to the main runner.

6. In an umbrella according to claim 1, a stop limiting the relative angular displacement of the outer arm and of the inner arm of the main spreader to a position which said outer arm and said inner arm assume when the umbrella is in the opened state.

7. In an umbrella according to claim 6, a pivot connecting the outer and the inner arm, a stop consisting of a portion of the outer arm of the main spreader, said portion extending beyond the pivot connecting said outer arm with said inner arm and being adapted to contact said inner arm when in the limiting position.

References Cited in the file of this patent

UNITED STATES PATENTS

177,339	Kirkham	May 16, 1876
912,206	Thayer	Feb. 9, 1909
1,249,007	Block	Dec. 4, 1917
1,577,227	Greenwald	Mar. 16, 1926
2,296,666	Haupt	Sept. 22, 1942