

- [54] **SELF-CLOSING UMBRELLA**
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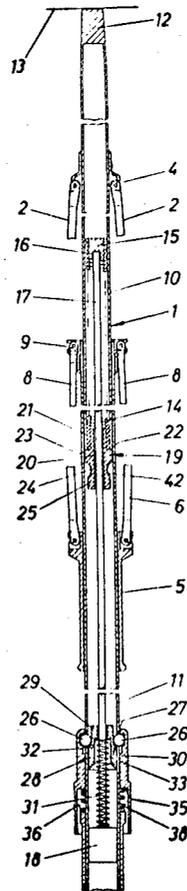
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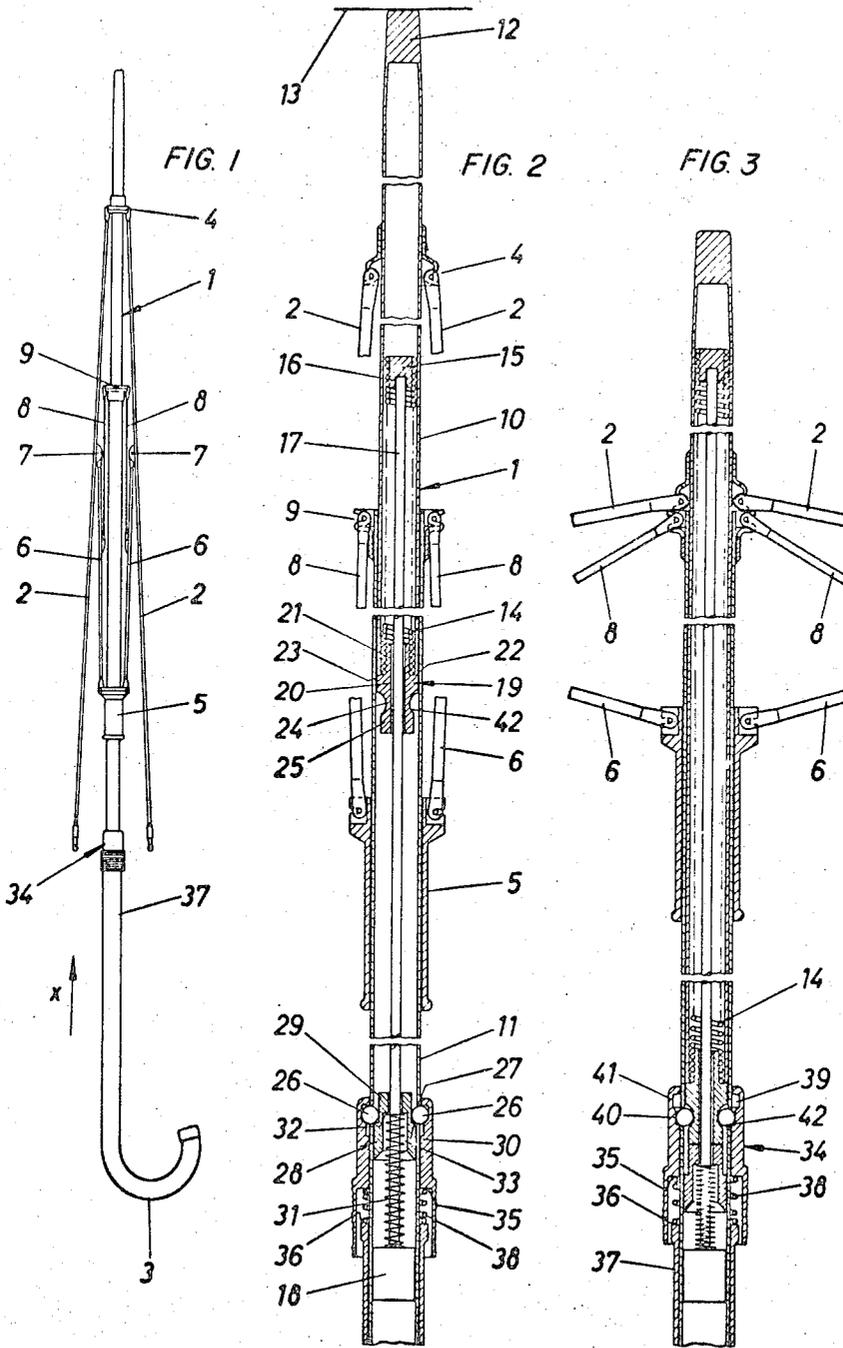
[57] **ABSTRACT**

A self-closing umbrella wherein there are two telescopic stick portions, a crown at the end of one stick portion with the dome ribs hinged thereto, a secondary crown fixed to the free end of the other telescopic stick portion, a runner adapted to slide on the other stick portion with stretcher means extending to the dome ribs and struts hinged to the stretcher means and to the second crown. A tension spring is arranged between the two telescopic stick portions so that when the umbrella stick is telescoped together, the dome ribs are opened and the tension spring is loaded. When the spring is released, the telescopic stick extends to its fullest extent and the dome ribs are closed on the stick.

- [56] **References Cited**
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5 Claims, 3 Drawing Figures





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SELF-CLOSING UMBRELLA

BACKGROUND OF INVENTION

1. Field of Invention

The present invention relates to a self-closing umbrella and more particularly to an umbrella having a two-piece telescopic stick.

2. Description of Prior Art

In most self-opening umbrellas of the type generally referred to as automatic umbrellas, a compression spring is used as a means for storing the energy to open and close the umbrella. A compression spring, however, is not axially stable and therefore results in power-consuming friction on the walls of the stick. A compression spring is also of a disadvantage in that the cross section is increased when it is compressed.

SUMMARY OF INVENTION

It is an aim of the present invention to provide a self-closing umbrella in which a tension spring is used to store the energy and the tension spring is provided within the stick of the umbrella rather than on the outside of the umbrella stick.

A construction in accordance with the present invention includes an umbrella having at least two telescopic stick members, one telescopic into the other, a crown on the first stick portion, dome ribs hinged to the crown, a runner slidable on the other stick portion, stretcher means hinged to the runner and to the dome ribs and a secondary crown fixed to the other stick portion and strut means hinged to the secondary crown and to the stretcher means, a tension spring associated between the two telescopic stick portions, such that when the telescopic stick is closed to its furthest extent, the secondary crown is adjacent a first-mentioned crown and the dome ribs are open to an umbrella open position and the tension spring is loaded; release means for releasing the tension spring thereby causing the umbrella stick portions to extend to their fullest extend and the dome ribs close on the stick.

An umbrella of this kind has the advantage of a one-handed operation. The tip of the umbrella stick is placed against a solid abutment and pressure is provided at the handle end of the umbrella to telescope the stick together to its shortest extent. This causes the dome ribs of the umbrella to open and the tension spring to be loaded. After the dome ribs have been spread to an umbrella open position, the catch means are provided which keeps the stick portions telescoped together. When this first is released, the tension spring causes the umbrella stick to extend to its longest axial extent and the dome ribs to pivot back onto the stick in an umbrella closed position. In a preferred embodiment, the release is in the form of a movable sleeve at the handle end of the stick.

In a preferred embodiment, the end of the tension spring nearest the crown of the umbrella is connected to a rod which extends within the umbrella stick and is fixed to the other umbrella stick at the handle end. The other end of the tension spring is connected to the first telescopic stick to which the crown is attached. Also attached to the end of the first stick portion at the end of the tension spring is a sliding member which is adapted to be engaged by the catch means when the umbrella sticks are collapsed together.

It is also preferred that the sliding member is provided with an annular groove which is engaged by locking balls in the catch means at the handle end of the umbrella stick.

This configuration produces an umbrella of the type in question which has advantages both in manufacture and in use. The advantage in use resides mainly in the special design and arrangement of the energy-storing means. In this connection, a tension spring is used as the means of storing energy, in spite of the fact that the telescoping umbrella stick must be telescoped together in order to charge the spring. The more satisfactory spring characteristic facilitates the loading of the spring. High axial stability is also provided. The full cross section of the tube may be used for the tension spring. The use of a tension spring also provided the advantage that the cross section of the spring decreases when the spring is under tension. The frequently unpleasant grinding and rubbing noises are eliminated. The energy-consuming friction, almost unavoidable with compression springs, is eliminated as a source of trouble. The structural members now used are kept simple.

IN THE DRAWINGS

Having thus generally described the nature of the invention, particular 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 schematic view of an umbrella without the covering material showing the telescopic stick in its fullest extent and the dome ribs closed on the stick;

FIG. 2 is a fragmentary axial cross section taken through the umbrella stick, the umbrella being in the same position as in FIG. 1; and

FIG. 3 is a fragmentary longitudinal cross sectional view of the umbrella when the umbrella stick is telescoped together to its shortest extent and the dome ribs are in their open position.

The self-closing umbrella has an umbrella stick 1. Dome ribs 2 are hinged to the main crown 4 of umbrella stick 1. Stretcher members 6 extend from runner 5 to support dome ribs 2 and are hinged thereto at 7. Struts 8 run from stretcher members 6 and are hinged to a secondary crown 9. The handle is marked 3.

Umbrella stick 1 comprises a tube 10 mounting main crown 4 and tube 11 fixed to the handle. Tube 10 is smaller in diameter and telescopes into tube 11. The secondary crown 9 is fixed to the end of the tube 11. Both tubes are preferably cylindrical.

In order to open the umbrella, tip 12 is placed against an abutment, for example the ground 13. Pressure is exerted in the direction of arrow x (FIG. 1), the umbrella stick is telescoped together and the energy-storing spring, in the form of tension spring 14, is loaded. This operation causes the secondary crown 9 to attain a position adjacent the crown 4 and forces the dome ribs 2 to open.

This spring 14 is within umbrella stick tube 10. The upper end of this spring encloses a sliding core 15 connected to the end coil spring 14. The core 15 has a recess 16, into which the upper end of a rod 17 is inserted and fixed. Rod 17 passes centrally through the umbrella stick 1 to another core 18 fixed in tube 11.

The other end of tension spring 14 is connected to a sliding member 19 which defines an axial passage 20. As seen in the direction of the umbrella crown, the sliding member is stepped. Stepped part 21 is screwed into the final coils of the tension spring 14. Sliding member 19 has a shoulder 22. Under the action of spring 14, lower edge 23 of tube 10 rests upon shoulder 22.

The sliding member 19 fulfills another function. It is also a part of the locking mechanism. To this end, sliding member 19 has an annular groove 24 in its surface, located on a section 25 of sliding member 19 which tapers towards handle 3. Annular groove 24 cooperates with locking balls 26, the latter are located in openings 27, of suitable cross section in tube 11.

When dome ribs 2 are closed and the spring 14 is unloaded, locking balls 26 are supported by a filler member 28 which also slides on rod 17. The filler member has a section 29 of smaller diameter and stepped shoulder 30 abuts against balls 26 which in this case is acting as a stop for the member 28. The filler member 28 is spring loaded in a direction towards the tip of the umbrella stick 1; the spring being marked 31. One end of the spring 31 enters a recess 33 in this filler member 28 forming a shoulder 32, while the other end rests on core 18. Spring 31, a compression spring, moves on rod 17.

When the umbrella stick is being telescoped, sliding member 19 comes up against filler member 28 and pushes it against the action of spring 31 into the position shown in FIG. 3. At this time, balls 26 are caused to move radially inwardly by means of sleeve 34, forcing the balls 26 to enter annular groove 24. Sleeve 34 slides on umbrella stick tube 11 and is spring loaded. To this end, sleeve 34 is machined to form a shoulder 35, supporting one end of the spring 38 while the support for the other end of the spring 38 consists of expanded end face 36 of umbrella handle tube 37. Compression spring 28 runs on umbrella stick tube 11.

In order to improve the grip, the larger diameter of sleeve 34 is grooved at right angles to the axis of the stick.

At this end of the smaller diameter section, a two-stage annular recess 39 is defined serving to control the locking balls 26. Smaller diameter stage 40 supports balls 26 when tension spring 14 is loaded (FIG. 3) while larger diameter stage 41 assumes this function when the spring 14 is unloaded (FIG. 2). Since sleeve 34 is spring loaded in the locking direction, the transition from stage 41 to stage 40 is automatic as soon as annular groove 24 reaches the plane of locking balls 26.

In order to initiate the self-closing operation, all that is necessary is to pull sleeve 34 in a direction opposite to that of the arrow, so that balls 26 may enter enlarged stage 41 of recess 39 acting as a release. When the energy-storing spring 14 is released, umbrella stick tube 10 moves in the direction of arrow X out of umbrella stick tube 11. The result of this operation is that the dome ribs 2, including their support system, reach the position shown in FIG. 1. The said supporting system acts to some extent as a brake, so that gently closing of the umbrella, assisted by the tension spring used, is achieved.

I claim:

1. An umbrella frame including a dome and at least a two-piece telescopic stick comprising first and second tubular sections, lock means operatively connected to said sections for retaining said sections in telescoped relation, a tension spring inside said stick sections and being loaded when said sections are telescoped together, the force of said spring, upon release of said lock means which holds the sections of the stick in telescoped relation, producing closing movement of the frame dome, the first stick section including a crown, an end of the spring toward the crown being attached to a rod projecting the first stick section toward the crown, another end of the spring engaging a slidable part movable in the stick, a lower edge portion of the first stick section engaging said slidable part and said part including an axial opening for passage of the rod, said slidable part including locking recess means defined in a surface portion for accomodating locking ball means; and locking ball means in said second stick section for engagement in said locking recess means.

2. An umbrella frame according to claim 1, characterized in that the locking recess means comprises an annular groove located in a reduced section of the slidable part.

3. An umbrella frame according to claim 1 characterized in that a filler part movable axially against the action of the spring when the slidable part abuts it, is operatively associated with the locking ball means.

4. An umbrella frame according to claim 1, characterized in that the locking ball means is surrounded by an external sleeve slidable on the second stick section and operative as a release grip, said sleeve having a two-stage annular recess for controlling the locking ball means, and being spring-loaded in a locking direction.

5. An umbrella frame according to claim 1, characterized in that the rod passes through the filler part and through a filler part spring.

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