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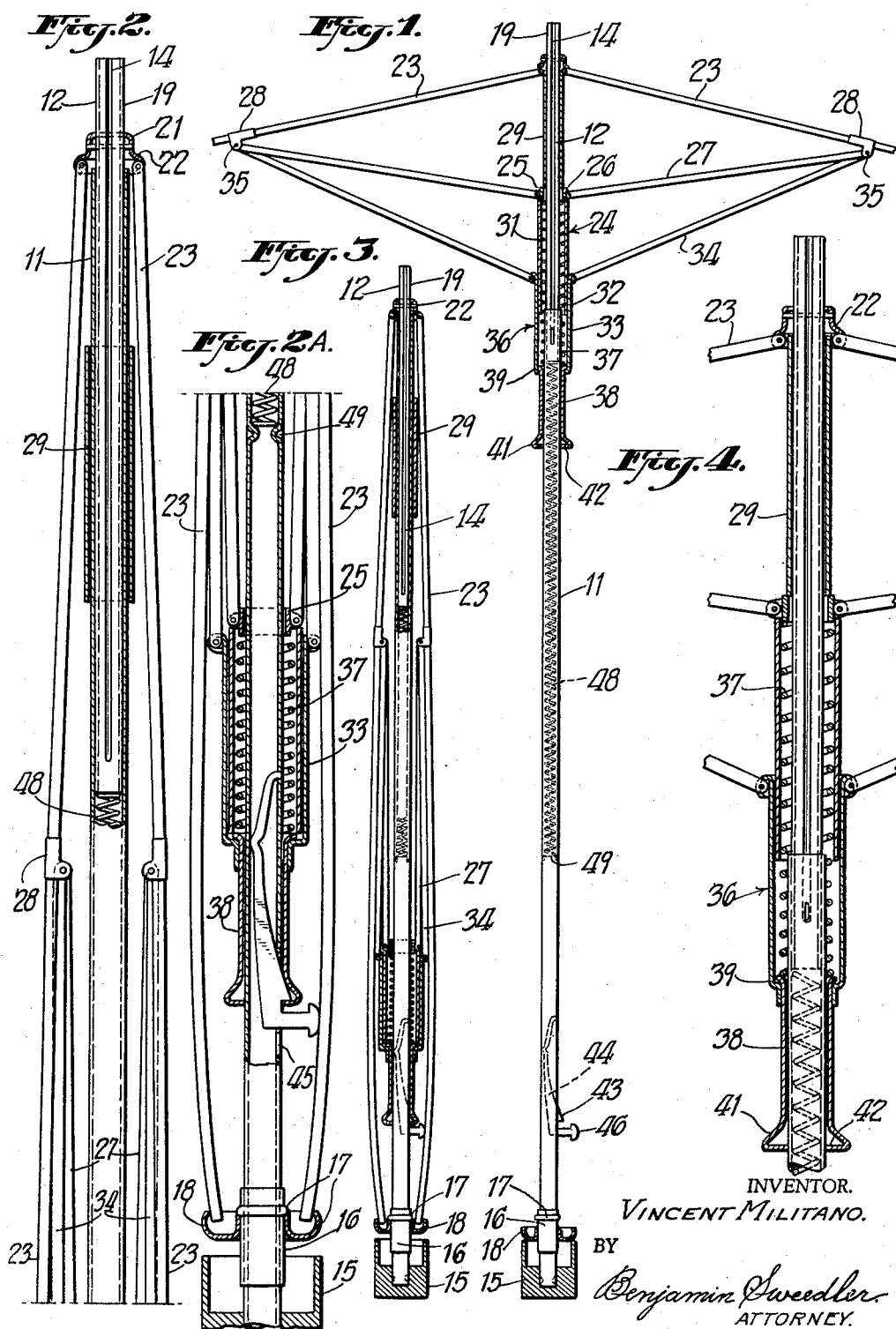
V. MILITANO

2,906,277

SELF-OPENING UMBRELLAS

Filed Dec. 26, 1957

2 Sheets-Sheet 1



Sept. 29, 1959

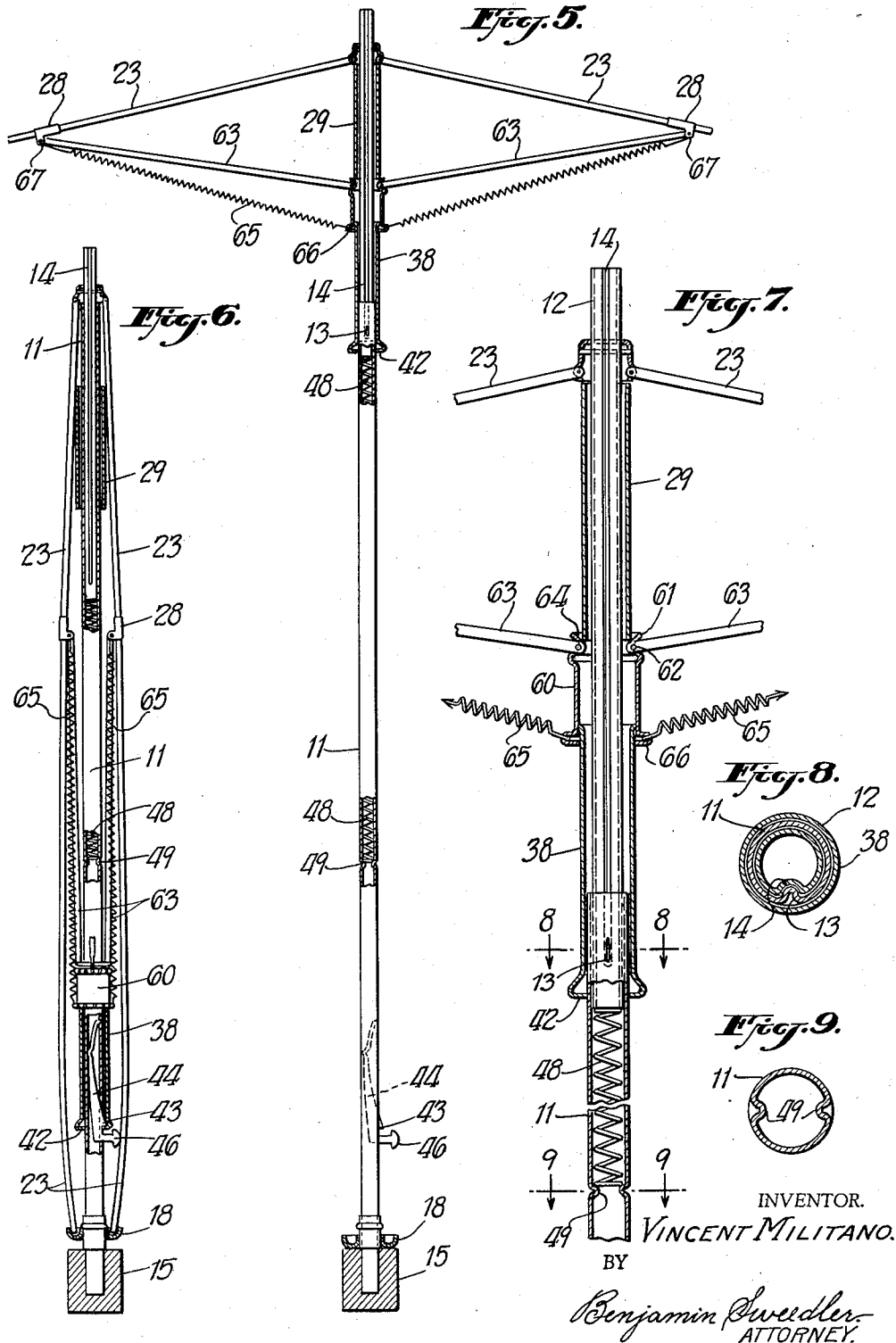
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1

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SELF-OPENING UMBRELLAS

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9 Claims. (Cl. 135—22)

This invention relates to umbrellas of the small compact type involving upper and lower telescopic tubular umbrella sticks or tubes, the upper of which carries the umbrella canopy or cover and the lower the umbrella handle, and more particularly to self-opening umbrellas of this type.

It is among the objects of the present invention to provide a self-opening compact relatively short umbrella, the stick of which is of telescopic design, which umbrella when opened by releasing the catch, automatically positions the canopy relative to the umbrella handle so that the canopy is properly disposed with respect to the head of the user and this with the umbrella handle held in a comfortable position.

It is another object of the present invention to provide a self-opening umbrella designed so that upon release of the catch, which release effects automatic opening of the umbrella, the opened umbrella is automatically extended to a height to position the umbrella canopy above the user's head and this with the umbrella handle held in a comfortable position.

Still another object of the present invention is to provide a compact umbrella which when closed is relatively short, say about 18 inches in length, and yet when opened positions the umbrella canopy at the right height to clear the head of the user and does so automatically upon release of the catch which locks the umbrella in closed position.

Another object of the present invention is to provide such compact umbrella made of standard parts and which, therefore, can be made economically.

Other objects and advantages of the present invention will be apparent from the following detailed description thereof.

In the accompanying drawings forming a part of this specification and showing, for purposes of exemplification, preferred embodiments of this invention, without limiting the claimed invention to such illustrative instances:

Fig. 1 is an elevational view, partly in section, of the umbrella frame in the open position and shows only a portion of the ribs to permit illustration on a larger scale than would otherwise be possible;

Fig. 2 is a fragmentary elevational view, partly in section, of the upper portion of the umbrella frame and shows the umbrella frame in closed position;

Fig. 2A is a fragmentary elevational view, partly in section, of the lower portion of the umbrella frame in closed position; Figs. 2 and 2A, when superimposed, show the complete umbrella frame on an enlarged scale as compared with the scale of Fig. 1;

Fig. 3 is an elevational view, partly in section, of the umbrella frame showing the latter in closed position; the scale of Fig. 3 is substantially the same as that of Fig. 1 and appreciably smaller than that of Figs. 2 and 2A;

Fig. 4 is a vertical section (the ribs and stretchers being shown fragmentarily in elevation) of the upper

2

portion of the umbrella frame when in open position; the scale of this figure is substantially the same as that of Figs. 2 and 2A;

Fig. 5 is an elevational view of an umbrella frame in open position, shows part of the lower tube broken away to show the interior structure, and illustrates a modified form of the invention;

Fig. 6 is an elevational view with portions of the lower tube broken away to illustrate the interior structure, and shows the umbrella frame of Fig. 5 in closed position;

Fig. 7 is a fragmentary elevational view, partly in section, showing the upper portion of the umbrella frame in open position on an enlarged scale as compared with the scale of Figs. 5 and 6;

Fig. 8 is a horizontal section taken on line 8—8 on Fig. 7; and

Fig. 9 is a horizontal section taken on line 9—9 on Fig. 7.

Referring first to the preferred embodiment of the invention which is shown in Figs. 1 to 4, inclusive, 11 is a lower tube in which an upper tube 12 is telescoped for sliding up and down movement relative to the lower tube 11. As best shown in Fig. 8, the lower tube 11 is provided with a crimped inwardly extending projection 13 desirably about a half inch long located near the top of tube 11. The projection slides in a congruent groove 14 in the upper tube 12. Groove 14 extends from the top of tube 12 to short of the bottom of this tube. In this way the two tubes may slide vertically relative to each other but relative turning movement is prevented; furthermore, the base of groove 14 acts as a stop to prevent movement of tube 12 beyond the point where the projection 13 engages the base of groove 14.

Secured to the lower end of the lower tube 11 is a handle 15. As conventional, a sleeve 16 having a stop 17 is fastened to the lower tube 11 near the handle 15. Slidable on this sleeve 16 is the rib-tip-holding device 18. Stop 17 is so positioned that when the slidable rib-tip-holding device 18 is moved into contact therewith the rib-tip-holding device 18 is properly positioned to engage the tips of the ribs.

Pinned to the free end 19 of the upper tube 12 as at 21 is a notch 22. Pivoted to the notch 22 are one end of the ribs 23 to which the umbrella canopy or cover is fastened in any conventional way.

A compound runner 24 is slidably mounted on the tubes 11 and 12. In the embodiment of the invention shown in Figs. 1 to 4, this compound runner 24 comprises a top runner section 25 having a bore of an interior diameter such that it can slide on the lower tube 11 and hence slides on upper tube 12 with sufficient clearance to slide on the lower tube 11 of somewhat greater external diameter than that of tube 12. Pivotal secured to runner section 25 as at 26 is one end of each of a series of stretchers 27, the other end of each of which is pivoted to a lap 28 fixed to the ribs 23.

Concentric with and mounted on the upper part of tube 12 is a stop sleeve 29. This sleeve can be loosely mounted on the tube 12 so that it floats thereon above runner section 25 except when engaged by this runner section when the umbrella is in the open position or can be secured to the runner section 25 for movement therewith. It functions as a stop to engage the notch 22 and thus prevent movement of runner section 25 beyond the point shown in Fig. 1. In the embodiment of the invention shown in the drawings sleeve 29 floats, i.e., is slidable on tubes 11 and 12 except when its lower end is engaged by runner section 25. When the umbrella is opened, as hereinafter described more fully, runner section 25 engages the lower end of sleeve 29 and forces it upwardly until it abuts the inner walls of notch 22

3

as shown in Figs. 1 and 4. In this position it prevents further upward movement of runner section 25.

Integral with or secured to runner section 25 is a depending cylindrical sleeve 31. This sleeve 31 is slidable relative to the second runner section 32 which desirably is in the form of a cylindrical sleeve 33 having a slightly larger internal diameter than the outer diameter of sleeve 31 to permit relative movement of these two sleeves. Pivoted to the top of the second runner section 32 is one end of each of a second set of stretchers 34, the other end of each of which is pivoted at 35 to the lap 28 fixed to the ribs 23.

The sleeves 31 and 33 together provide a spring casing 36 in which is mounted a coil spring 37. This spring has one end bearing on the runner section 25 and the other end on the base of the cylindrical sleeve 33. A finger-piece 38 is mounted for slidable movement on tube 11. This finger-piece 38 desirably is in the form of a cylindrical sleeve having end 39 positioned within the spring case 36 and the other end 41 shaped to provide an annular hook 42.

Hook 42 is adapted to be engaged by the nose 43 of the catch 44 suitably mounted in the lower portion of tube 11, so that the nose 43 extends through slot 45 in tube 11. When the finger-piece 38 is moved downwardly to the position where nose 43 engages the hook 42, the umbrella ribs are then locked in closed position. Catch 44 is provided with a button 46 which when depressed causes the nose 43 to release the hook 42 permitting the compound runner 24 to move upwardly under the influence of spring 37.

As shown in the drawings, this spring 37 is under maximum tension, i.e., in the state of maximum compression when the umbrella is closed. This clearly appears from Figs. 2 and 2A. While still partially loaded, most of the energy of the spring is dissipated when the umbrella is in the open position shown in Figs. 1 and 4; in this position spring 37 is in its expanded state.

Positioned within lower tube 11 is a coil spring or other resilient member 48, one end of which bears against a crimped ledge 49 in tube 11 and the other end against the lower edge of tube 12 disposed in tube 11. This resilient member 48 when fully compressed, i.e., in the position shown in Fig. 3, may exert a pressure of from about 8 to 10 pounds against the lower edge of the upper tube 12 tending to move it to its extended position relative to lower tube 11. When the umbrella is opened the spring 48 exerts a pressure of the order of 2 or 3 pounds. Spring 37, on the other hand, is a stronger spring than spring 48, i.e., tends to exert a greater force when compressed than does spring 48 when compressed. In general, a spring 37 which when compressed will exert a force of the order of 15 to 20 pounds or more will be satisfactory. It will be understood the above disclosure herein with respect to the springs is exemplary and that any suitable springs may be employed to accomplish their functions of opening the umbrella and extending the upper tube 12 relative to the lower tube 11 when the umbrella is opened.

In operation of the umbrella shown in Figs. 1 to 4, assuming the umbrella is in the open position shown in Figs. 1 and 4, upon engagement of the finger-piece 38 and movement thereof downwardly the stretchers 34 and 27 first move downwardly actuating the ribs 23 and through the notch 22 moving the upper tube 12 downwardly to compress the spring 48. This action takes place because the force exerted by the spring 37 is substantially greater than that exerted by spring 48 and hence in the initial movement of the finger-piece 38 from the umbrella open position the spring 48 is compressed due to downward movement of tube 12 within tube 11. When tube 12 is moved downwardly to the full extent of its permissible movement, usually of the order of from 3 to 4 inches, further movement of the finger-piece 38 causes the runner section 25 to move downwardly compressing

4

the spring 37. As the runner section 25 moves downwardly sleeve 29 descends and passes over and down along the lower tube 11 to the position shown in Figs. 2 and 3. When spring 37 is fully compressed, i.e., when sleeve 31 has moved within the spring case 36 to the position shown in Fig. 2A and in Fig. 3, so that the spring 37 is completely compressed, further movement of the finger-piece 38 effects closing of the umbrella, which takes place when the nose 43 engages the hook 42 locking the umbrella in closed position. Movement of the rib-tip-engaging member 18 upwardly confines the tips of the ribs of the umbrella.

When it is desired to open the umbrella the rib-tip-engaging member 18 is first moved to release the rib-tips, i.e., member 18 is moved from the position shown in Fig. 3 to that shown in Fig. 1. Thereafter upon depressing the button 46 nose 43 of the catch 44 releases the finger-piece 38. As soon as this takes place spring 37 causes the compound runner 24 to move upwardly to the position shown in Figs. 1 and 4 to open the umbrella. As runner section 25 moves upwardly it engages the lower end of stop sleeve 29 and moves it upwardly. During the movement of the umbrella to its open position or while in this open position, spring 48 exerts a force on tube 12 to move it to the extended position shown in Fig. 1; sleeve 29 and runner section 25 move upwardly on the extended portion of tube 12 under the influence of spring 37. This upward movement of tube 12 effects an elevation of the canopy relative to handle 15 a distance equal to the length of the extension of tube 12 thus effected; this may be of the order of 3 to 4 inches and results in positioning the umbrella canopy above the head of the user with the handle 15 comfortably held by the user.

The parts are so proportioned that when the umbrella is open the finger-piece 38 is disposed on the lower tube 11 near the top thereof as shown in Figs. 1 and 4.

In the modification shown in Figs. 5, 6 and 7, parts thereof which are substantially the same as those of Figs. 1 to 4 have been identified by the same reference characters. The modification of Figs. 5, 6 and 7 involves a runner 60 to the lower end of which the finger-piece 38 is suitably attached to move the runner downwardly when desired. Runner 60 has at its upper end an integral collar 61 to which is pivoted at 62 one end of each of a set of stretchers 63, the other end of each of which is pivotally secured to a lap 28 on a rib 23. Collar 61 is crimped as at 64 to provide a stop-surface which engages the lower edge of floating stop-sleeve 29 when the umbrella is in the open position. If desired sleeve 29 may be fastened to or made integral with collar 61.

One end of each of a series of coil springs 65 (known as Klinger springs) is pivotally fastened as at 66 to the base of runner 60 and the other end of each of these springs 65 is pivotally fastened as at 67 to a lap 28 on a rib 23. These springs 65 when the umbrella is in closed position shown in Fig. 6 are under maximum tension, i.e., are extended to their maximum and tend to contract. The energy stored in these springs when the umbrella is closed functions to effect automatic opening of the umbrella when the nose 43 of the catch 44 is moved out of engagement with the hook 42 on the finger-piece 38.

The operation of the modification of Figs. 5, 6 and 7 should be clear from the above description of this modification and of the operation of the modification of Figs. 1 to 4, inclusive.

It will be noted that the present invention provides a self-opening compact umbrella which automatically positions the canopy relative to the umbrella handle so that it is properly disposed with respect to the head of the user and this with the umbrella handle held in a comfortable position. Upon opening of the umbrella by release of the catch, which opening takes place automatically, the upper tube 12 is automatically extended to a height to position the umbrella canopy above the head of the user.

The umbrella of this invention may be made compact and relatively short, of the order of about 18 inches in length when closed, so that it is eminently satisfactory for use in automobiles and elsewhere and yet when opened positions the umbrella canopy at the right height to clear the head of the user, and does this automatically upon release of the catch which maintains the umbrella in closed position. The automatic extension of tube 12 may be of the order of 3 or 4 inches or more to properly position the umbrella canopy relative to the head of the user, to permit carrying the umbrella comfortably.

Moreover, the umbrella embodying the present invention involves only standard parts in its construction so that it can be made economically.

Since certain changes may be made in the above-described umbrellas and different embodiments of the invention could be made without departing from the scope of this invention, it is intended that all matter contained in this description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Thus while coil springs have been shown for opening the umbrella and effecting extension of tube 12, other resilient members which are the functional equivalent of the springs may be used.

What is claimed is:

1. An umbrella comprising, in combination, upper and lower telescopic tubes forming the umbrella post and slidable relative to each other from an umbrella closed position in which the said tubes are disposed in substantially completely telescoped condition with little of the upper tube extending beyond the upper edge of the lower tube to an umbrella open position in which a substantial portion of the upper tube extends beyond the upper edge of the lower tube, an umbrella canopy carried by said upper tube, self-opening means for the umbrella on the lower tube, which means when actuated effects opening of the umbrella and means for automatically moving the upper tube to its extended position upon actuation of said self-opening means to raise the umbrella canopy from the position occupied thereby when fully open to a still higher position relative to the lower end of said lower tube.

2. An umbrella comprising, in combination, upper and lower tubes in telescopic engagement, a notch fastened to the upper tube, a slidable runner, ribs pivoted to said notch, an umbrella canopy on said ribs, spreaders having one end pivoted to said slidable runner and the other end to said ribs, resilient means for effecting opening of the ribs, and resilient means for effecting extension of the upper tube relative to the lower tube to elevate the umbrella canopy from its fully open position to a still higher position relative to the lower end of said lower tube.

3. An umbrella comprising, in combination, upper and lower tubes in telescopic engagement, a handle on the lower tube, a notch pinned to the upper tube, a slidable runner, ribs pivoted to said notch, a set of spreaders having one end pivoted to said slidable runner and the other end to said ribs, spring means for effecting opening of the ribs and the umbrella canopy carried thereby, a catch at the lower end of the lower tube for engaging said runner when the umbrella is in closed position, to maintain said umbrella closed, said catch when released permitting said spring means to effect automatic opening of said umbrella, and spring means in the lower tube acting on the upper tube to automatically extend it relative to the lower tube when the umbrella is opened upon release of said catch.

4. An umbrella comprising, in combination, upper and lower telescopic tubes slidable relative to each other from an umbrella closed position in which the said tubes are disposed in substantially completely telescoped condition with little of the upper tube extending beyond the upper edge of the lower tube to an umbrella open position in which a substantial portion of the upper tube extends beyond the upper edge of the lower tube, an umbrella canopy carried by said upper tube a notch pinned to the extending position of the upper tube, a runner slidably

mounted on the lower tube, a catch on the lower tube for locking said runner in the umbrella closed position, spring means acting on said runner which means, upon release of said catch, moves the umbrella to the open position, and means for extending the upper tube to its extended position when said spring means are released by said catch to raise the umbrella canopy from the position occupied thereby when fully open to a still higher position relative to the lower end of said lower tube.

5. An umbrella, as defined in claim 4, in which said means for extending the upper tube to its extended position is a coil spring disposed in said lower tube.

6. An umbrella comprising, in combination, a first tube, a second tube slidably and telescopically mounted within said first tube, a notch fastened to said second tube, ribs pivoted to said notch, a runner slidably mounted on said first tube, stretchers having one end pivotally connected to said runner and the other end to said ribs, a catch on said first tube for engaging said runner in the umbrella closed position to maintain said umbrella closed, an umbrella canopy on said ribs means acting on said runner to move it to actuate the stretchers and open the umbrella ribs when the catch is released, and spring means within said first tube acting on said second tube when said ribs have been opened for moving said second tube outwardly away from said first tube to raise the umbrella canopy from the position occupied thereby when fully open to a still higher position relative to the lower end of said first tube.

7. An umbrella, as defined in claim 6, in which the runner is a compound runner having two slidable sections spaced apart and the stretchers consist of two sets of stretchers, one having one end thereof pivoted to one runner section and the other end pivoted to the ribs, and the second set of stretchers having one end pivoted to the other runner section and the other end pivoted to said ribs, a spring casing movable with said compound runner, and a spring within said spring casing, said spring being the means acting on the runner to move it to actuate said stretchers.

8. An umbrella, as defined in claim 6, in which the means acting on said runner to move it to open the umbrella ribs is a series of springs each having one end pivoted to the runner and the other end pivotally connected to the ribs.

9. An umbrella comprising, in combination, upper and lower telescopic tubes slidable relative to each other from an umbrella closed position in which the said tubes are disposed in substantially completely telescoped condition with little of the upper tube extending beyond the upper edge of the lower tube to an umbrella open position in which a substantial portion of the upper tube extends beyond the upper edge of the lower tube, a notch fastened to the extending portion of the upper tube, ribs pivoted to said notch, a first runner slidable on said tubes, stretchers having one end pivoted to said first runner and the other end pivoted to said ribs, a second runner slidable on said tubes and movable relatively to said first runner, a second set of stretchers having one end pivoted to said second runner and the other end to said ribs, a spring acting between both of said runners tending to force them apart, and a spring in the lower tube acting on the upper tube tending to move said upper tube to its extended position when the umbrella canopy is in the open position.

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