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COLLAPSIBLE UMBRELLA
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2,492,457

Fig. 1.

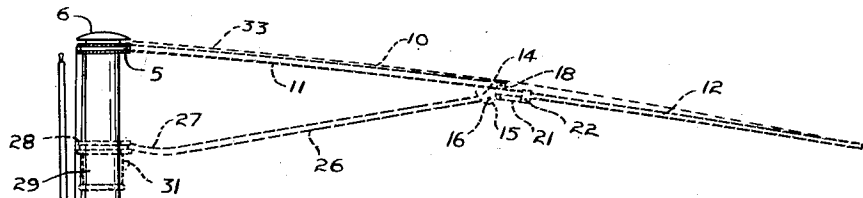


Fig. 2.

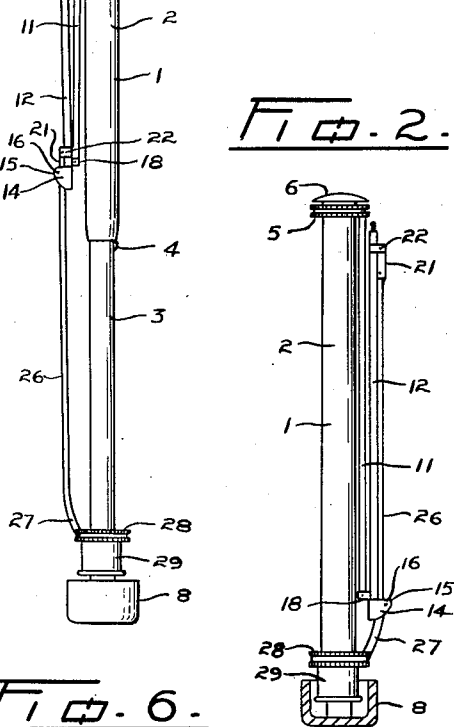


Fig. 3.

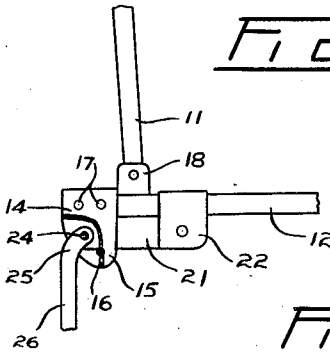


Fig. 4.

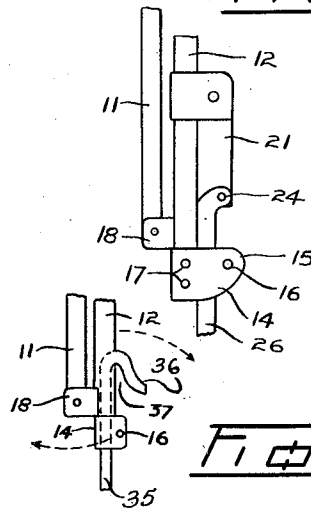
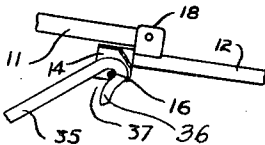


Fig. 5.

Fig. 6.



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COLLAPSIBLE UMBRELLA

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3 Claims. (Cl. 135-25)

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My invention relates to improvements in collapsible umbrellas.

The objects of the invention are to provide an umbrella having a frame consisting of inner ribs and outer ribs hingedly connected together to give lateral rigidity and wherein the strut for spreading each of said inner and outer ribs is arranged to slide along the outer rib when the umbrella is brought to collapsed position and to lie outside of the cloth cover of the frame. A further object is to provide a collapsible umbrella which requires no manipulation to raise it into position of use, other than the usual movement of the slide and to support said umbrella in natural position of use with its tip uppermost.

Referring to the drawings:

Fig. 1 is a sectional view of the invention showing in dotted line one complete rib in full open position and in full line one complete rib extended but with the umbrella in closed position but not collapsed or folded.

Fig. 2 is a similar sectional view showing the umbrella fully closed.

Fig. 3 is a detail view of the rib hinge fitting, showing the outer rib swinging about the free end of the inner rib.

Fig. 4 is a view of similar points showing the inner and outer ribs folded together and the strut sliding lengthwise of said outer rib.

Figs. 5 and 6 are detail views of a modification of the rib strut connection.

In the drawings like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates an umbrella shaft having a tubular upper section 2 and a lower telescopic section 3 having a spring stop button 4, which is adapted to releasably retain the lower section 3 in extended position as shown in Figure 1.

The tubular upper section 2 is fitted with the usual spider 5 and tip 6, and the telescopic section 3 is fitted with a handle cap 8 of any desired design. Pivotaly connected to the spider 5 is a plurality of folding ribs generally indicated by the numeral 10, each of which consists of an inner rib member 11 and an outer rib member 12, which are connected together by a hinge fitting 14. The hinge fitting 14 is provided at one end with downwardly turned side plates 15 which are connected together adjacent their outer ends with a pin 16 and are secured to the inner end of the outer rib member 12 as at 17, see detail in Figures 3 and 4. The hinge fitting 14 is provided with a pair of upwardly turned

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hinge lugs 18 which hingedly engage the free end of the inner rib section 11.

Slidably mounted upon the outer rib member 12 is a link 21 having at its outer end a loop 22 embracing the said rib section and being hingedly connected by a pin 24 to the outwardly bent portion 25 at the free end of a strut 26. The inner end of the strut 26 is curved as at 27 and is hingedly connected to the spider 28 of a runner 29, which is slidable upon the umbrella shaft 1, which runner is adapted to be held in its raised position by the usual spring latch 31. The upper end of the link 21 is adapted to pass between the side plates 15, the outer rib member 12 and the pin 16, as shown in Figure 3, and the outer end of the strut is adapted to slide therethrough also.

The frame 33 formed by the folding ribs is adapted to be covered with any desired cover, indicated in dotted line in Figure 1, and is adapted to be secured to said frame by stitches or otherwise to the tip 6, the outer end of the inner rib members 11 and the free end of the outer rib members 12.

In the modified form of connection between the folding rib and the strut, as shown in Figures 5 and 6, the strut here indicated by the numeral 35 is provided with a downwardly turned hook 36 having an open bight 37 in place of the link 21. This hook is adapted to engage the pin 16 as the runner 29 is brought to the end of its downward stroke towards the handle cap 8 and tends to swing its outer rib member 12 outwardly away from the complementary inner rib member 11 as shown by the arrows in Figure 5, and as the runner is moved to open the umbrella to cause the strut to abut the pin 16 and prevent further swinging movement between said rib members 11 and 12.

Assuming the umbrella to be collapsed as shown in Figure 2, to open it the tip 6 is held by one hand and the lower telescopic section 3 of the shaft 1 and the runner 29 are drawn downwardly to their fully extended position. The lowering of the runner brings the several links 21 from their position adjacent the tip 6 to the outer end of the inner rib sections, with the inner end of each link slightly beyond the pin 16 of the hinge fitting 14. As the free end of the strut reaches this position, the outer rib sections 12 fall radially outward by gravity to or beyond the position shown in Figure 3, which naturally inclines the free end of the inner rib sections away from the shaft 1, so that by releasing the runner 29 and sliding it upwardly along said shaft, the parts of the folding ribs 10 fall into alignment

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with each other leaving the curved outer end 25 of the strut to abut the pin 16 and prevent said strut from sliding endwise through the hinge fitting 14.

To close and collapse the umbrella, the runner 29 is drawn downwardly along the shaft 1 and the umbrella is inverted to a position where the tip 6 is below the handle cap 8. As soon as the outer rib members 12 drop below the horizontal, or towards the tip 6, the runner 29 is moved towards the tip 6, thus causing the struts 26 to slide through the hinge fitting 14 and with the links 21 to slide along the outer rib member 12 to the position shown in Figure 2. The cover 33 will then be folded in two portions between the outer rib members 12 and the inner rib members 11. The telescoping of the lower section 3 of the shaft, which may be simultaneous with the last described movement of the runner 29, completes the collapsing of the umbrella.

What I claim as my invention is:

1. A collapsible umbrella comprising a contractile shaft having a spider at its upper end, a plurality of folding ribs hingedly connected to the spider, a runner upon the shaft, a plurality of struts hingedly connected to said runner and engaging said folding ribs, each of said folding ribs being formed with an inner rib member and an outer rib member, a hinge fitting secured to the outer rib member and hingedly connected to the inner rib member, said hinge fitting having a passage through which the strut is adapted to slide parallel to said outer rib member as the rib is folded and the umbrella is collapsed.

2. A collapsible umbrella comprising a contractile shaft having a spider at its upper end, a plurality of folding ribs hingedly connected to the spider, a runner upon the shaft, a plurality of struts hingedly connected to said runner and engaging said folding ribs, each of said folding ribs being formed with an inner rib member and an outer rib member, a hinge fitting secured to the

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outer rib member and hingedly connected to the inner rib member, a link having a pin hingedly connecting said link to the outer end of each strut and having a loop embracing the outer rib member to slide therealong and through a portion of the hinge fitting member, said strut being at an angle to the link when the folding rib is extended in open position and being parallel with the outer rib section when the rib members are folded together and the umbrella is collapsed.

3. A collapsible umbrella comprising a contractile shaft having a spider at its upper end, a plurality of folding ribs hingedly connected to the spider, a runner upon the shaft, a plurality of struts hingedly connected to said runner and engaging said folding ribs, each of said folding ribs being formed with an inner rib member and an outer rib member, a hinge fitting secured to the outer rib member and hingedly connected to the inner rib member, said hinge fitting member having a pair of spaced side plates extending downwardly from the outer rib member, a pin bridging from one plate to the other to form a passage therebetween, a link hingedly connected to the outer end of the strut and having a loop slidably engaging the outer rib member, said link being adapted to extend into the said passage to permit the strut to engage the bridging pin and to prevent said link and strut from sliding lengthwise of the outer rib member when the umbrella is in open position.

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The following references are of record in the file of this patent:

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