

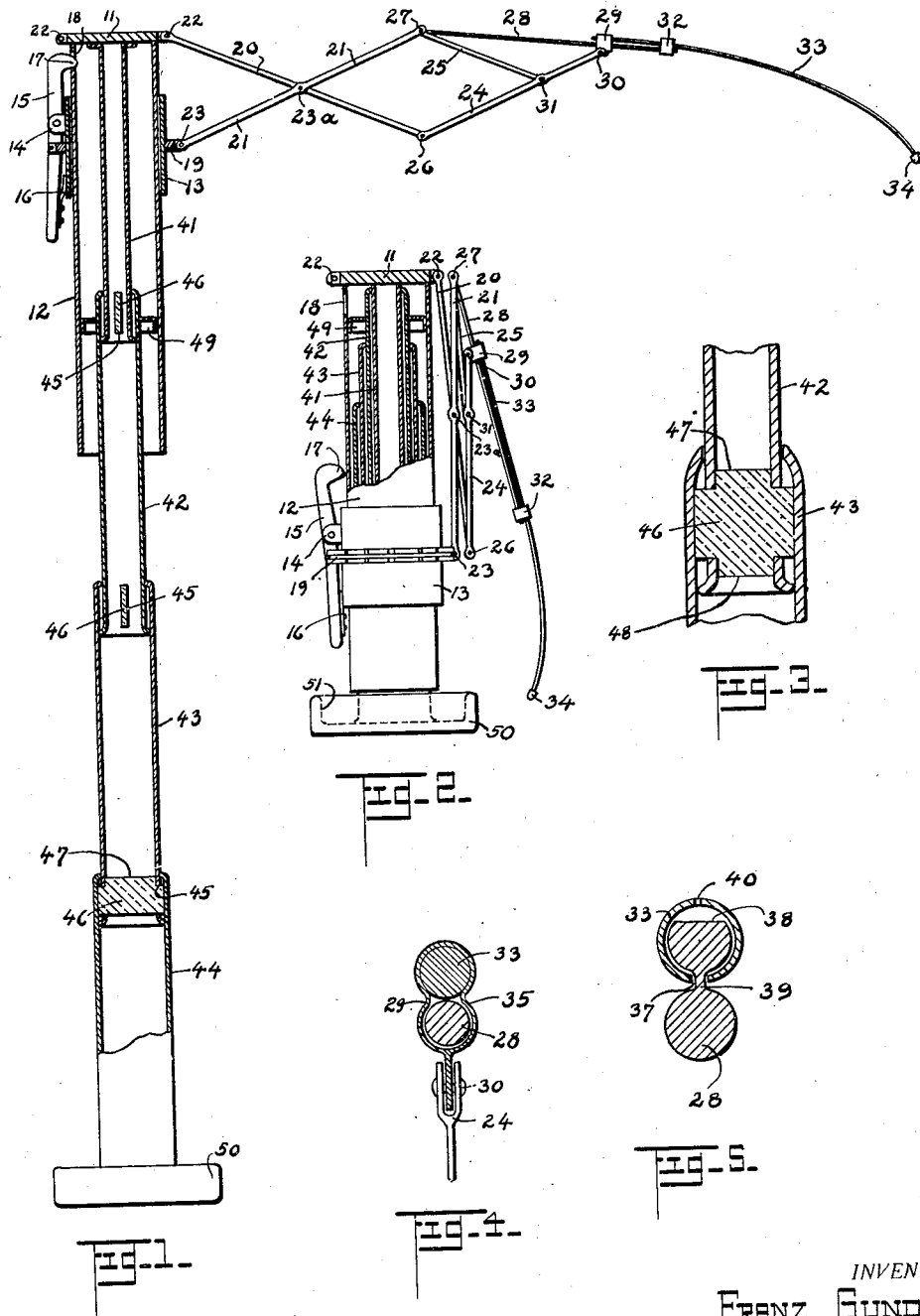
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COLLAPSIBLE UMBRELLA

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COLLAPSIBLE UMBRELLA

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My invention relates to collapsible umbrellas, which, in an open position, resemble the ordinary umbrella by showing a comparatively large umbrella cover stretched in substantially a plane so as to afford a means of protection for the user; and which show, attached to said umbrella cover and to the frame which serves to support it in a stretched position, a handle of convenient length and stability so that the user may hold the stretched umbrella cover over his or her head or other parts of the body which are to be protected by the umbrella. In the closed position, however, the collapsible umbrella differs from the ordinary umbrella in being reduced in length. In the ordinary umbrella the cover is folded to extend longitudinally along the side of the handle, when the umbrella is closed so that the closed umbrella represents a substantially round object, of the length of the rigid handle upon the sides of which lies the umbrella cover in layers of a length substantially equal to the radius of said umbrella cover. The collapsible umbrella on the other hand, when folded together is considerably reduced in length also, ordinarily considerably below the length of the radius of the umbrella cover.

It has been the object of my invention to make a collapsible umbrella which does not involve the complications usually involved in the construction of an umbrella which is greatly reduced in size, when closed. Some of the particular objects of my invention are, first, to support the umbrella cover by ribs and to attach the ribs and other parts of the collapsible umbrella to the cover so that the fabric is firmly held in a stretched position, i. e., when the umbrella is open; second, to provide the same firm rigidity in the frame of a collapsible umbrella which is given to the ordinary umbrella by solid ribs and solid struts; third, to limit the number of parts of the frame carrying the stretched cover to a minimum; fourth, to avoid folding of the cover upon itself or wedging or clamping thereof between the ribs, struts or other parts of the frame, when the umbrella is collapsed; fifth, to provide a telescopically collapsible handle which is rigid and may be conveniently handled in open, partly open and closed

position; sixth, to provide a frame which is solid and self-supporting, when the umbrella is in open position, without depending upon the tension of the cover stretched thereupon, and which does not subject said cover to undue strains and stresses.

I attain these and other objects by the mechanism illustrated in the accompanying drawings. The umbrella cover which in all forms of umbrellas and parasols is substantially the same, is not shown in the drawings. Full details of the manner in which the cover is fastened upon the frame of this collapsible umbrella are given in the description.

Figure 1 shows a sectioned side view of part of my invention, showing the fully open handle as well as a rib and the corresponding supporting means in the open position.

Figure 2 shows a partly sectioned similar view, in which the frame and the telescopic handle are almost completely folded together.

Figure 3 shows an enlarged, sectional view of one of the joints on the handle.

Figure 4 shows an enlarged cross section of the frame near a point where a strut is hinged upon a slide connecting the sections of a rib.

Figure 5 shows a cross section of a modified slide used in connecting the sections of a rib.

Similar numerals refer to similar parts throughout the various views.

The frame attaches, at the top of the umbrella, to a flange 11 which closes the upper end of the outer shell 12. Upon this outer shell 12 is slidably arranged the sleeve 13. Upon the side of this sleeve is mounted a small forked bracket 14. In this bracket is pivoted the catch 15 which carries at its lower end a spring member 16 which presses that end of the catch away from the sleeve. The other end of the catch 15 is provided with a hook 17 which is adapted to engage in a hole 18 in the outer shell 12, just below the flange 11, when the sleeve is pushed upwardly upon the outside of the outer shell to a position in which the umbrella is open.

Upon the sleeve is mounted a ring 19 which is similar in diameter to the flange 11. The flange 11 and the ring 19 are notched at regular intervals upon their peripheries.

In these notches the struts 20 and 21 are hinged upon the flange and the ring, respectively, by pivots 22 and 23. The struts 20 and 21 are hinged upon each other at points near their centers by a pivot 23^a.

Upon the free ends of struts 20 and 21 are hinged the struts 24 and 25, by the pivots 26 and 27. Upon the pivot 27 is also hinged the rib 28. This rib is slidable in the slide 29 which is hinged upon the free end of strut 24 by means of a pivot 30. The free end of the strut 25 is hinged upon the strut 24 by means of a pivot 31 so that the struts 20, 21, 24 and 25 form the links of lazy tongs which are opened and collapsed by sliding the sleeve 13 up and down upon the surface of the outer shell 12. The struts making up the lazy tongs and the ribs connected thereto collapse alongside of each other upon or near the outer shell and concentrically thereto, much in the same manner as illustrated in my Patent Number 1,706,922, of March 26, 1929 for a collapsible umbrella frame.

Upon the end of the rib 28 is fastened a slide 32 in which is slidably arranged the rib 33. One end of the rib 33 is fastened upon the slide 29 so that the ribs 28 and 33 move parallel to and close to each other when the pivots 27 and 30 are moved away from or brought close to each other by an opening or collapsing of the lazy tongs 20, 21, 24, 25. The free end of rib 33 is provided with a button 34 in the manner in which the ends of the ribs of umbrellas are commonly protected.

The link 29 is illustrated in Figure 4. The sheet metal 35 out of which the link is made is fastened upon the rib 33; it is shaped below said rib to form an enclosure in which the rib 28 is adapted to slide back and forth. The sheet metal 35 extends for a certain distance below said enclosure, and the strut 24 is hinged upon this extension 36.

The sleeve 32 may be constructed in a corresponding manner and the device of Figure 4 will represent a link of that kind, when the extension 36, upon which the strut 24 is hinged, is omitted and the ribs 28 and 33 are reversed. That is the shape in which that link is indicated in Figures 1 and 2, but since that link slides back and forth upon the rib 33 and thus may cause friction against the bottom of the umbrella cover which is stretched across the frame of the umbrella top and is fastened upon the link 29 and upon that part of rib 33 along which the slide 32 does not move when the umbrella is opened and closed, I may construct the slide 32 in such a manner that it does not protrude above the rib 33. A means for carrying through such a construction is illustrated in Figure 5 in which the rib 33 is shown to be hollow with a slot 37 along its bottom. In the hollow center of rib 33 is slidable a short rod 38 which is fastened by a connection 39

to the rib 28, said connection 39 sliding along the slot 37. If the short rod 38 is flattened upon its top side, in the manner indicated in the drawings, a space is left in the rib 33 above said rod which may serve to accommodate threads by means of which the cover may be sewed upon the top of the ribs 33, said threads entering upon and leaving the hollow rib through fine perforations 40, longitudinally arranged upon the top of said rib.

From the flange 11 arises in the outer shell 12 a tube 4 of a small diameter over which are telescoped in rotation the successively larger tubes 42, 43 and 44. The upper ends of the tubes 42, 43 and 44 are contracted so as to slide upon the smaller tubes 41, 42 and 43, respectively, likewise the ends of the tubes 41, 42 and 43, are flared out so as to slide upon the insides of tubes 42, 43 and 44, respectively.

The tubes 41, 42 and 43 are provided with vertical slots 45 near their lower ends. Whereas the tubes 41 and 42 are shown in the drawings in such a manner that these slots are squarely looked upon, the tube 43 is turned to a position at right angles with the positions of 41 and 42, so that the slots at the lower end of tube 43 face each other in a direction parallel to the plane of the drawings. In the slots 45 are seated flat rubber pieces 46 which are of a thickness substantially corresponding to the width of the slots 45. The sides of these rubber pieces are cut down to a height substantially corresponding to the length of the slots 45 and they extend through those slots so that their ends abut in frictional engagement upon the insides of the tubes 42, 43 and 44. Whereas the height from which the rubber piece 46' is reduced from the top downward, only, in Fig. 1 to pass through the slot 45, the rubber piece 46 is shown to extend also below the lower edge of the slot, in the illustration of Figure 3; when cut to this latter shape, with tongs 47 and 48 extending up and down in the tube, the rubber piece will be seated more firmly in the inner tube. The distances to which the rubber pieces extend through the slots, the width and the length of said slots determine the degree to which the ends of the rubber pieces engage upon the tubes which slide upon the outside of the tubes in which these rubber pieces are fastened. The manufacturer of my umbrella may thus provide whatever tension is desired to hold the telescoping tubes in their positions relative to each other. A collar 49 forms part of tube 42. It is slidable in the outer shell 12 and serves to enhance the strength of the handle by guiding the telescoped tubes in the outer shell.

The largest tube 44 is closed at its bottom by a knob 50. This knob may be provided with an annular groove 51 as shown in Figure 2, into which may be inserted the buttons 34 at the ends of the ribs 33, when the um-

brella is closed, so that the ribs are held together in an orderly fashion in the collapsed condition. The ribs 33 are shown curved in the drawings, corresponding to the downwardly concave shape which is ordinarily observed in the covering in an umbrella when the umbrella is in an open position. The ribs 33 do however not have to be shaped in that manner but they may be straight, substantially parallel to the spokes 28, along their whole extent, and the cover may be stretched over and fastened upon the ribs in such a manner that it pulls the ribs 33 into the shape exhibited in Figure 1.

To offer additional points of support for the cover extending across the frame of the umbrella said fabric may be fastened to the frame at the pivots 27 and also to the flange 11. To prevent the cover from being caught between the struts 20 and 21, when the umbrella is closed, the umbrella is preferably held upside down, when being closed, so that the cover hangs down from the umbrella, after it has been closed and may then be folded or pulled over the collapsed umbrella to lie in that position which the user finds most convenient.

A complete web of supporting ribs may be incorporated in my invention by arranging in the frame additional ribs bridging the upper junction pivots 22 and 27 of the lazy tongs by ribs similar to the rib 28 bridging the junction pivots 27 and 30. Such ribs would be hinged upon the pivot 22 on one end, would be slidably connected to the rib 28 on their other end by a slide of the type of slide 42 and would be slidable in a slide hinged upon pivot 27. Such a web of ribs may similarly be carried through in connection with lazy tongs consisting of a pair of sets of struts in which each set comprises more than two struts, as compared with the execution shown in the drawings, where each set is made up of two struts only.

The combined action of the lazy tongs and ribs characterizes my invention as a collapsible umbrella in which telescopically jointed ribs radiate from the umbrella head when the umbrella is opened, lazy tongs serving as an operative member. Likewise I have developed improved means for frictionally setting the collapsible handle of the umbrella at any desired length. My invention covers means for collapsing an umbrella in this fashion and its scope embraces the methods involved in obtaining my objects.

I claim:

1. In a collapsible umbrella of the kind described, including an outer shell, and a sleeve slidable upon said shell; lazy tongs operatively connected to said outer shell and said sleeve, and ribs comprising operatively connected sections longitudinally slidable upon each other and operatively connected to said lazy tongs, the inner end of the inner rib

section being pivotally connected to the outer end of that arm of the lazy tongs which on its other end is connected to said slidable sleeve, and the inner end of the outer rib section being pivotally connected to the free end of an arm of the lazy tongs frame which is connected to said outer shell.

2. In a collapsible umbrella including an outer shell, and a sleeve slidable upon said shell; lazy tongs operatively connected to said outer shell and said sleeve, and ribs comprising operatively connected sections operatively connected to said lazy tongs, the end sections of said ribs being unobstructed on their upper sides, and the adjoining sections of said ribs being longitudinally slidably attached to said end sections of said ribs from below the inner end of the inner rib section being pivotally connected to the outer end of that arm of the lazy tongs which on its other end is connected to said slidable sleeve and the inner end of the outer rib section being pivotally connected to the free end of an arm of the lazy tong frame which is connected to said outer shell.

Signed at New York in the county of New York and State of New York this 23rd day of September A. D. 1929.

FRANZ GUNDEL