Dec. 6, 1932. M. MONZ ET AL 1,890,440

COLLAPSIBLE POCKET UMBRELLA

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Fig. 1.

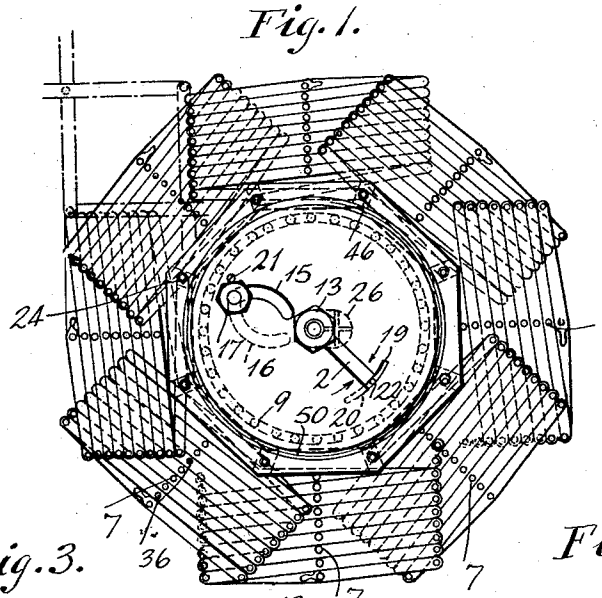


Fig. 3.

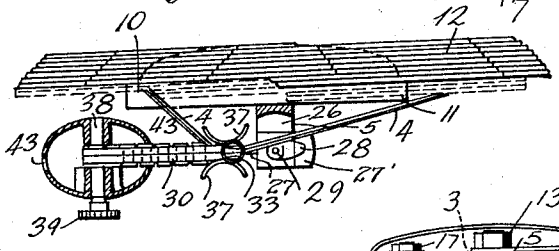


Fig. 5.

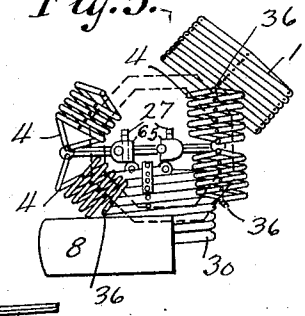
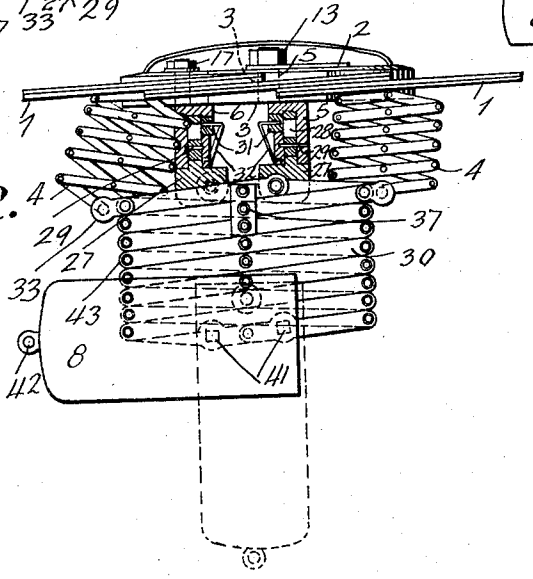


Fig. 2.



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Fig. 4.

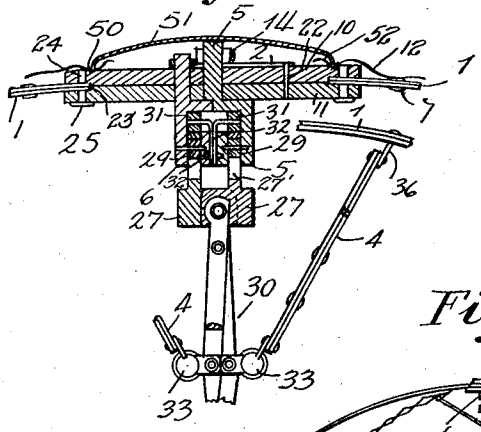


Fig. 9.

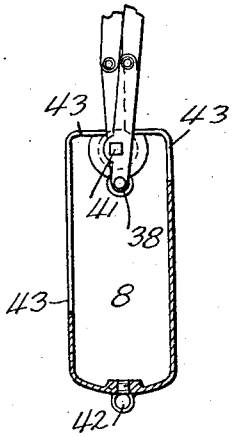


Fig. 10.

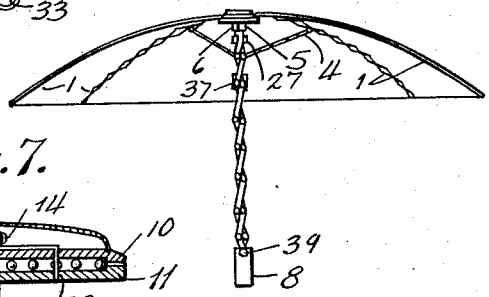
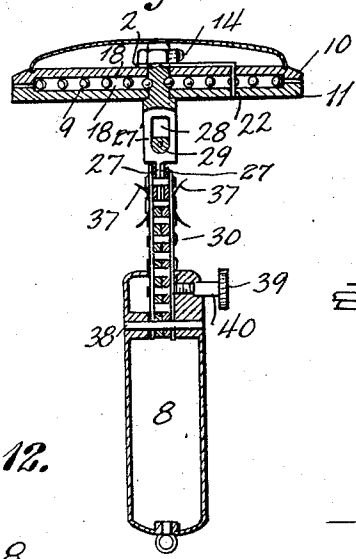


Fig. 7.



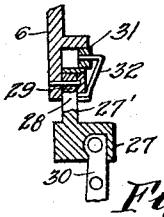


Fig. 12.

Fig. 6.

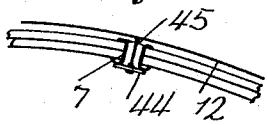


Fig. 11.

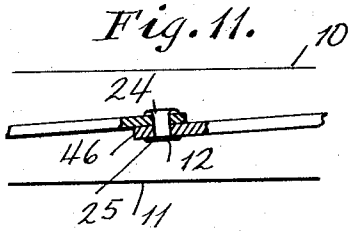
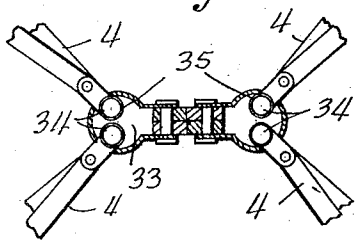


Fig. 8.



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COLLAPSIBLE POCKET UMBRELLA

Application filed February 5, 1930. Serial No. 426,165.

The invention relates to a collapsible pocket umbrella and has for its primary object to provide an umbrella of this type which, when in collapsed condition, is of such small dimensions as to be capable of being conveniently carried in a gentleman's pocket or in a lady's pocketbook or handbag.

It is also an object of the invention to provide a collapsible umbrella which is simple in construction and reliable in operation, and can be manufactured at a low cost.

On the accompanying drawings is shown by way of example a preferred embodiment of the invention. In said drawings,

Fig. 1 is a plan view of our improved umbrella drawn to full size and showing various ribs in closed, partly open, and completely open position; Fig. 2 is a vertical side view of the same, partially in section and showing the umbrella in partly collapsed condition; Fig. 3 shows the umbrella in collapsed or folded position; Fig. 4 is a partial vertical sectional view illustrating the umbrella in open position; Fig. 5 is a bottom plan view, on a reduced scale, showing the umbrella in closed position; Fig. 6 is a detail showing how the covering is fastened to the ribs or arms; Fig. 7 is a view through the center of the umbrella at right angles to the view shown in Fig. 2; Fig. 8 shows a detail of the rib or arm supports; Fig. 9 illustrates in front elevation the bottom portion of the handle; Fig. 10 is a view on a reduced scale of the umbrella in open position; and Figure 11 is a detail showing the coupling of the arms or ribs when the umbrella is open; while Fig. 12 is a partial detail view illustrating the position of certain parts when the umbrella is opened and just prior to the locking of the staff in the extended position.

Our improved collapsible umbrella includes two superposed preferably octagonal disks or plates 10, 11 at the center of which are lugs 3, 3; a hinge body 5 in the form of a bolt passes through lugs 3, 3, and is provided with threads at its upper end, the disks 10, 11 being free to revolve about the body 5; plate 2 on top of disk 10 is screwed tight over the body 5 in such manner as to permit free movement between plate 2 and disk 10; a nut 13 is screwed over plate 2 and tightened by lock-screw 14 (see Figs. 1 and 4).

A slot 15 in disk 10 and a slot 16 in disk 11 control the rotation of the disks 10, 11 relatively to each other, with the aid of a finger 6 which passes through both of said slots. As is shown in Fig. 1, in the collapsed position of the umbrella the finger 6 passes through the ends of the slots further removed from the center of the disks or plates 10, 11. Upon movement of the finger 6 toward the center of the plates in the manner set forth hereinbelow, its simultaneously effects relative rotation of the two disks in opposite directions, the finger finally coming to a position of rest at the inner ends of the two slots. It will be understood that the slots are suitably conformed to produce the movements just described. The effect of the relative rotation of the disks will be described hereinbelow. The upper end of the finger 6 is threaded to receive a nut 17 which is held in adjusted position by a cotter pin 21, the nut permitting free angular movement of the plates with respect to the finger.

On the inner sides of disks 10, 11 are superposed annular grooves 18, 18 containing ball-bearings 9 to insure smoothness of operation during rotation (see Fig. 7). A slot 19 in disk 10 and a slot 20 in disk 11 receive a pin 22 riveted to plate 2 for guiding the relative movement of the disks 10, 11 and preventing improper displacement of the latter (see Figs. 1 and 4).

The octagonal disks 10, 11 are obliquely rabbeted contrary to each other at each margin on the inner side and recessed to a depth shown in Figs. 1 and 4 at 23; when both disks are superposed facing the rabbets, they form a fanwise groove 23 on the perimeter (see Figs. 1 and 4).

The ribs or arms of our improved umbrella comprise sets of crossed or lazy tong links 1 lying in a plane substantially parallel to the plates or disks 10, 11. These ribs are so connected to the plates 10, 11 that upon relative rotation of such plates from the full line to the dotted line position shown in Fig. 1 the links are expanded or extended first to the position shown at the upper left-hand corner

of such figure, and finally to the position indicated in Fig. 10. To this end, one of the inner two crossed terminal links of each set of links is pivotally connected with a rivet 24 in the upper plate 10 and the other to a rivet 25 in the lower plate 11 (Fig. 4), the rivets being preferably located at the corners of the octagonal plates, the two rivets for each set of links being positioned one at a corner of the upper plate and the other at the next corner (to the right or left, i. e. 45° removed) of the lower plate. The plates are provided with the marginal grooves or rabbets 23 for accommodating the inner ends of the links, the grooves being provided with walls 46 (Figs. 1 and 11) adjacent to the rivets 24, 25 and against which the links abut when in the open position, so that the links are held firmly in the open position. The outer ends of the outer links of each set of links may be provided with hemispherical extensions which in the open position of the links cooperate to form a complete sphere for the purpose of ornamentation (Fig. 1).

The hinge bodies 5, 6 are enlarged below the plate 11 and are provided with mortises 26, 26 into which fit tenons 27′ (Fig. 4) of blocks 27, 27. These tenons have elongated slots 28, 28, slightly flattened at the upper part and semicircular at the lower part (see Fig. 7) and hinged on pins 29, 29 fixedly positioned between the walls of the mortises 26. The pins 29 are semicircular at their lower surface and slightly flattened at their upper surface, so that when the umbrella is in partly collapsed condition (Figs. 2 and 7) the lower circular bounding surface of the slots 28 will be engaged by the lower circular surfaces of the pins 29, so that the blocks 27 with their tenons are capable of being rotated about such pins as shown in Fig. 3; whereas when the umbrella is in the open position (Fig. 4) the flat surfaces of the pins and slots will engage each other and thus prevent rotation of the blocks 27 which are in this way rigidly held in the open position. The collapsible staff or stem 30, which is formed, like the arms or ribs 1, of crossed or lazy tong links, is pivoted at its upper end to the two blocks 27. To insure complete rigidity for the staff 30 when the umbrella has been opened, I provide conical plugs 31, 31 which are fixed to the free ends of leaf springs 32 anchored on the members 5, 6, and which, when the blocks 27 are moved toward each other (Fig. 4) upon opening of the umbrella, are forced into the free space in the mortises 26 above the tenons, so that the latter are prevented from moving upwardly into the position in which they can rotate about pins 29.

The links of the staff 30 are of segment-like cross-section (Fig. 4) and are pivotally connected to the outer surfaces of the flat bottom portions of the blocks 27, the latter partly overlapping when the umbrella is in the open condition as shown in Fig. 7. When collapsed the staff, as indicated above, is turned into the horizontal position about the pins 29.

The socket mountings 33, 33 are attached to the outer surfaces of the lower ends of the first two links of the staff 30 and loosely riveted to the links (see Figs. 2, 4, and 8). Each socket has a pair of seats 34 in each of which is positioned a ball 35 provided with an ear. The ears of balls 35, 35, 35, 35, are loosely riveted to the collapsible arm supports or braces 4 (see Figs. 4 and 8 which show the open position and Fig. 2 which shows the collapsed position). The balls 35 and sockets 33 thus form a universal joint between the arms 4 and staff 30. The arm supports or braces 4 are hingedly riveted to flat extensions of special rivets 36 (Figs. 1 and 4) connecting the same with the arms 1.

Curved finger supports 37, 37 are fixedly riveted to the staff 30 and are adapted to be held between the fingers during the opening of the umbrella. The staff 30 is provided with a handle 8 which may be hinged upon a rivet 38 connecting the lowermost ends of the bottom two links of the cane. A square slightly conical pin 39 is urged by a spiral spring 40 into square opening 41 in the bottom two links, which openings come into alignment when the umbrella is opened (see Figs. 2 and 9). The extended staff is thus prevented from collapsing by the pin 39.

A perforated ear 42 is provided at the end of the handle 8 to receive a band or ribbon (Figs. 2 and 7) to enable the umbrella to be carried over the arm when only temporarily collapsed. A slit 43 in the handle 8 permits part of the collapsed staff 30 to be received and housed within the handle as shown in Fig. 2.

The covering 12 is preferably of annular form, the inner edge being embedded in an annular groove 50 on disk 10 with the aid of a metal cover 51 and is protected against injury by the latter by means of a rubber insert 52 (Fig. 4). The covering 12 is fastened to each arm 1 at each hollow rivet 7 except those nearest the disks 10, 11 and also those, designated 36, through which the supports 4 are connected to the arms. The fastening may be accomplished by means of a fibre pin 44 which is attached to a piece of tape 45 sewn to the covering at corresponding points and then inserted through the hollow rivets 7, the pin 44 being placed in the horizontal position (see Fig. 6).

When the umbrella is collapsed the covering falls into upright folds which are pressed down flat (see Fig. 3) when inserted into a bag or pocket.

To open the umbrella, the staff 30 and handle 8 are swung into the vertical position by pulling on pin 39; two fingers are placed on the finger supports 37, 37, and then handle 8 is pulled down, at which moment the staff 30

opens pulling blocks 27, 27 down until the flat surfaces of slots 28 and pins 29 engage each other. The plugs 31, 31 then enter the spaces above the tenons of blocks 27, while the member 6 moves toward member 5 and effects relative rotation of plates 10, 11, whereupon the arms 1 become extended, the covering 12 becoming stretched until the position shown in Fig. 10 is reached. The pin 39 springs into holes 41, 41 thus keeping the umbrella rigid. To collapse the umbrella, the pin 39 is pulled out and the above operations reversed.

Variations from the specific form of the invention disclosed may be resorted to within the scope of the appended claims without departing from the spirit of the invention.

We claim:

1. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links forming the ribs of said umbrella, and a pair of superposed relatively rotatable plates mounted on said staff, each of said sets of lazy tong links being connected to both of said plates whereby they are extended or callapsed when said plates are rotated relatively to each other.

2. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links forming the ribs of said umbrella, and a pair of superposed relatively rotatable plates mounted on said staff, said sets of lazy tong links being each connected to the bottom face of the upper plate and to the top face of the lower plate, so that said links lie in an approximately horizontal plane and upon rotation of said plates relatively to each other are extended or collapsed along such plane.

3. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links forming the ribs of said umbrella, means for connecting said ribs to said staff in such manner that they lie in the collapsed condition in a plane approximately at right angles to the normal position of such staff, and means for extending and collapsing said links.

4. The combination as set forth in claim 3 wherein said collapsible staff is movable into a plane substantially parallel to the plane of said links.

5. The combination as set forth in claim 3 wherein said collapsible staff comprises a set of lazy tong links and is movable into a plane substantially parallel to the plane of said rib links.

6. The combination as set forth in claim 3 wherein said collapsible staff comprises a set of lazy tong links and is movable into a plane substantially parallel to the plane of said rib links, and including a handle pivoted to said staff at the lower end thereof, said handle movable to encase at least part of the collapsed staff.

7. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links adapted to be extended in a plane transverse to the staff to form the ribs of the umbrella, means operable to extend and collapse said links, and braces connecting said staff with at least certain of said rib-forming links.

8. The combination as set forth in claim 7 wherein said braces comprise sets of lazy tong links.

9. The combination as set forth in claim 7 wherein said means comprises a pair of relatively rotatable plates to which said sets of lazy tong links are connected, and means for effecting relative rotation of said plates.

10. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links forming the ribs of said umbrella, means operative to extend and collapse said links, and means at the lower end of the staff and engaging the same for locking the umbrella in the open position.

11. In a collapsible umbrella having a collapsible staff, the combination of a pair of hinge bodies having upwardly extending fingers, a pair of superposed polygonal plates loosely receiving said fingers and mounted on said bodies, one of said fingers being received in differently inclined and overlapping slots in said plates whereby upon relative movement of the bodies the plates are rotated relatively to each other with the other finger as a center, sets of lazy tong links connected to both of said plates and forming the ribs of the umbrella, and means connecting said bodies to said staff whereby they are caused to move simultaneously with the opening and collapsing movement of the staff.

12. The combination as set forth in claim 11, wherein the staff comprises a set of lazy tong links and wherein the connection between the hinge bodies and the staff includes blocks hinged to the end links of the staff and slidable within said hinge bodies.

13. The combination as set forth in claim 11, wherein the staff comprises a set of lazy tong links and wherein the connection between the hinge bodies and the staff includes blocks hinged to the end links of the staff and slidable within said hinge bodies, and filler blocks movable into the hinge bodies to lock the umbrella in open position.

14. The combination as set forth in claim 11, wherein the staff comprises a set of lazy tong links and wherein the connection between the hinge bodies and the staff includes blocks hinged to the end links of the staff and slidable within said hinge bodies, said blocks being hinged within said hinge bodies whereby the collapsed staff may be turned into a plane substantially parallel to said plates.

15. The combination as set forth in claim

11, including braces connected to said staff and to certain of said ribs.

16. The combination as set forth in claim 11, wherein the staff comprises a set of lazy tong links and wherein the connection between the hinge bodies and the staff includes blocks hinged to the end links of the staff and slidable within said hinge bodies, and a locking device adjacent to the lower end of said staff for locking the umbrella in the open position.

17. In a collapsible umbrella having a collapsible staff, the combination of a plurality of sets of lazy tong links connected to said staff and forming the ribs of said umbrella, said links in the open position of the umbrella lying in an approximately horizontal plane with their connecting rivets extending approximately vertically, said rivets being hollow, a covering, and means for attaching said covering to the ribs of the umbrella comprising fastening elements passing through certain of said hollow rivets.

18. In a collapsible umbrella, the combination of a collapsible staff composed of lazy tong links, a plurality of sets of lazy tong links adapted to form the ribs of the umbrella and pivoted to said staff on substantially vertical pivots so as to lie in the collapsed condition in a substantially horizontal plane, and means for extending and collapsing said links, said staff being movable into a plane substantially parallel with the plane of the collapsed ribs.

19. The combination as set forth in claim 18, in which said means comprises a pair of superposed polygonal plates supported by the staff and connected to said sets of lazy tong links, and means operative upon the opening or closing movement of the staff to cause relative rotation of said plates to effect simultaneous opening or closing of the ribs.

20. The combination as set forth in claim 18, in which said means comprises a pair of superposed polygonal plates supported by the staff and connected to said sets of lazy tong links, and means operative upon the opening or closing movement of the staff to cause relative rotation of said plates to effect simultaneous opening or closing of the ribs, said combination including supports in form of lazy tong links connected to said staff and to certain of said ribs.

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