Jan. 17, 1939. G. F. EELES 2,143,978

FOLDING OR COLLAPSIBLE UMBRELLA

Filed April 19, 1937 2 Sheets-Sheet 1

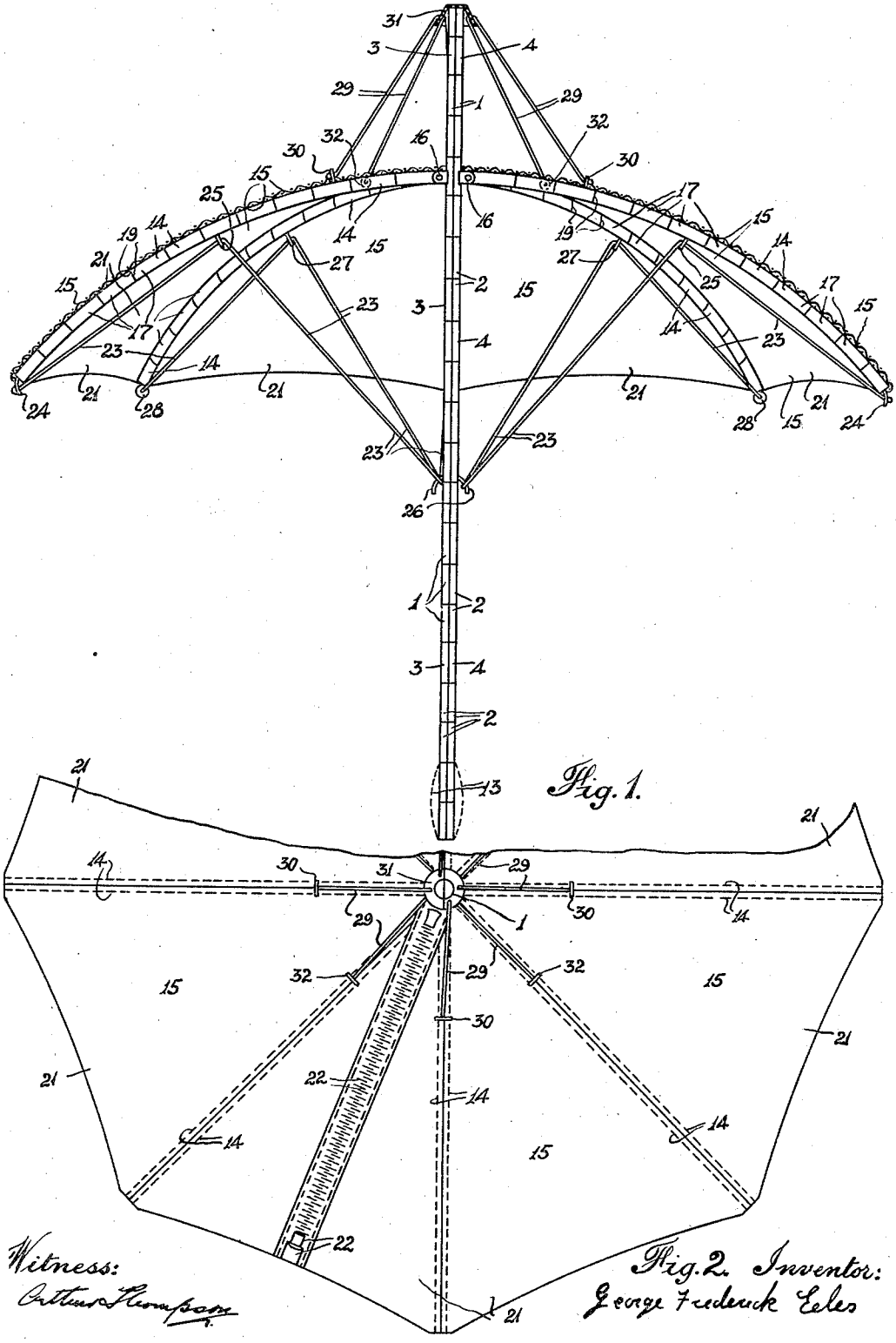


Fig. 1.

Fig. 2.

Witness:
Arthur Thompson

Inventor:
George Frederick Eeles

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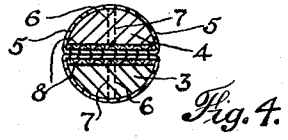


Fig. 4.

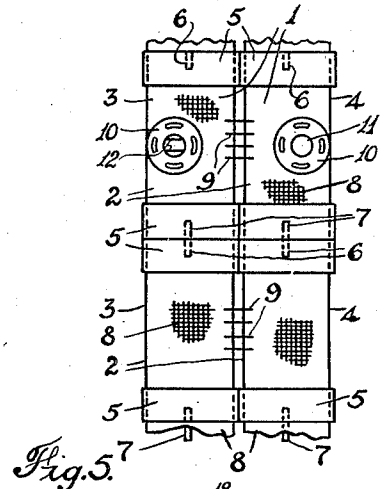


Fig. 5.

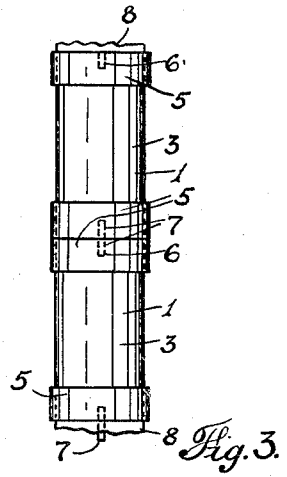


Fig. 3.

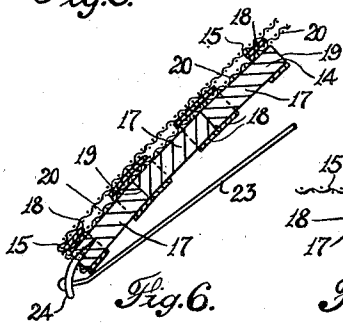


Fig. 6.

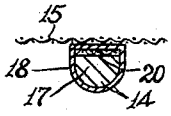


Fig. 7.

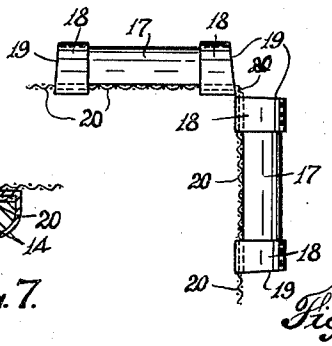


Fig. 8.

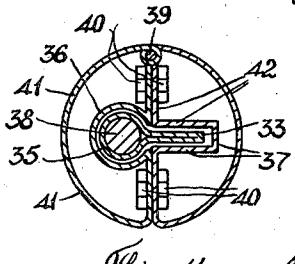


Fig. 11.

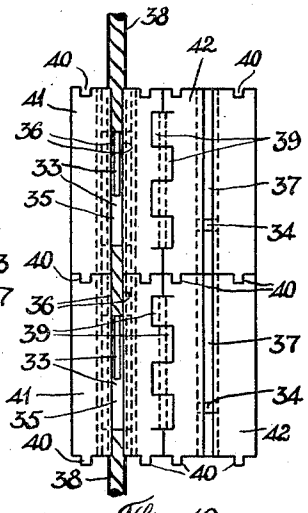


Fig. 10.

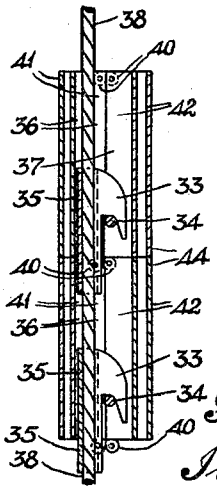


Fig. 9.

Witness:
Arthur Thompson

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Patented Jan. 17, 1939 2,143,978

UNITED STATES PATENT OFFICE

2,143,978

FOLDING OR COLLAPSIBLE UMBRELLA

George Frederick Eeles, Springs, Transvaal, Union of South Africa

Application April 19, 1937, Serial No. 137,833
In Great Britain May 4, 1936

14 Claims. (Cl. 135—25)

This invention has reference to umbrellas and like articles, such as parasols and sunshades.

The invention can be utilized in the construction of umbrellas and the like of ordinary dimensions, which are carried in the hand, and also umbrellas or like structures of larger proportions, including those which are arranged and secured in a fixed position.

The object of the invention is to construct a folding or collapsible umbrella or the like of strong and durable construction, which can be easily opened or distended when required for use and collapsed or folded into small compass when not required for use.

According to the invention the improved umbrella or the like comprises a folding or collapsible segmental or sectional support or stick, which also constitutes or provides, or has attached to it, the handle, and a fabric covering comprising a suitable number of appropriately shaped sections along the seams or joints between which are secured folding or collapsible segmental or sectional ribs. Two of the sections of the cover are preferably connected along their adjoining edges by means of a zipper or lightning fastener, or other suitable fastening means. A portion of the stick projects above or beyond the centre of the assembled fabric sections and is preferably connected, as by cords, strings, or other flexible means, to each of the ribs at a suitable point or points therein. In similar manner cords or other flexible connections attach the outer ends of the ribs to the stick below the fabric covering. The cords which attach the outer ends of the ribs to the stick may pass through guides attached to the ribs at or about the centre of their length.

The invention will be more fully explained with the aid of the accompanying sheets of drawings, wherein

Fig. 1 is a vertical section of the improved folding or collapsible umbrella in the open position.

Fig. 2 is a part plan of Fig. 1.

Figs. 3 and 4 are elevation and cross-sectional views respectively, drawn to an enlarged scale, of portion of the sectional stick.

Fig. 5 is an elevation of portion of the stick, in an open position.

Fig. 6 is a longitudinal sectional elevation of portion of one of the ribs, the fabric covering, and the cord connecting the rib to the stick.

Fig. 7 is a cross section of Fig. 6 on line *x*—*x*.

Fig. 8 is an elevation of two adjoining hinged sections of a rib opened about the hinge.

Fig. 9 is a sectional elevation of two sections of each half of the stick, illustrating a modification.

Fig. 10 is a view of sections of the stick in an open position, further illustrating the construction shown in Fig. 9, and

Fig. 11 is a sectional plan of the stick shown in Figs. 9 and 10, drawn to an enlarged scale.

Referring to the embodiment of the invention represented in Figs. 1 to 8, the stick **1** of the umbrella is divided longitudinally into halves **2** hinged together, each half **2** being divided transversely into sections **3**, **4**, respectively, of suitable short length, hinged together, and each section of each half being hinged longitudinally to the adjoining section of the other half. The sections **3**, **4** may be made of wood, metal or other suitable material, and are shown of substantially semi-circular shape in cross section. The sections **3**, **4**, particularly if made of wood, may, as shown, be fitted at both ends with semi-circular reinforcing metal bands **5**. The abutting ends of the sections **3**, **4**, interengage, for which purpose the bottom ends of the sections **3**, **4**, are each constructed with a slot **6**, and the upper ends of the adjoining sections **3**, **4**, are each provided with projecting pieces **7** adapted to engage in said slots **6** when the stick **1** is extended. The interengaging projections **7** and slots **6** retain the sections in correct relative position and prevent lateral movement of the one in relation to the other. The sections **3**, **4**, are hingedly connected together in a longitudinal direction, and transversely between their abutting ends by means of two strips of fabric **8**, or other flexible material, which lines the inner flat surfaces of all of the sections **3**, **4**, of the stick **1**. The inner edges of the strips **8** may be sewn together for a portion of the length of the sections **3**, **4**, centrally between the bands **5**, as indicated at **9**, to form the hinges about which the sections **3**, **4**, can be folded together, as shown in Fig. 4. Alternatively a single strip or piece of the flexible lining material may be used to line the sections **3**, **4**, of both halves **2** of the stick to constitute the hinges in both longitudinal and lateral directions. The sections **3**, **4**, are adapted to be separated in a longitudinal direction to open, as shown in Fig. 5, to allow the several sections **3**, **4**, to be collapsed, folded or rolled up into a compact coiled form, and, when uncoiled and closed or folded together, to form the stick as shown in Figs. 1 and 3.

The abutting sections **3**, **4**, are made rigid at the joints and retained in correct relative abut-

ting position by interengaging catches or studs, shown comprising the press studs 10 (see Fig. 5) one half of each of which has a button or projection 11 and which is fixed to the inside of one section 4, and the other half is fixed to the inside of the other section 3 and is fitted with a spring piece 12 which is engaged by the button 11 when the sections 3, 4, are folded together.

As shown in Fig. 1 a part of the folding or collapsible stick 1 may be utilized to serve as the handle, as indicated by the dotted curved lines 13. A suitable form of handle made of rubber or other suitable material which can be folded or collapsed may be provided and placed around the handle end part of the stick 1 to form or provide a grip.

The ribs 14 which carry the fabric covering 15 of the umbrella are also of folding or collapsible construction and are hingedly attached at their inner ends, at or near the top, to laterally abutting sections 3, 4, of the stick 1, as indicated at 16. Each of the collapsible ribs 14 comprises a number of articulated substantially semi-cylindrical sections 17 of wood, reinforced at the ends with metal bands 18 and shaped so as to abut at the ends, the abutting ends being bevelled, as shown at 19, so that the ribs 14 will assume the correct curved shape when the umbrella is opened or distended. The sections 17 of the ribs 14 are hingedly connected together by means of a piece of fabric 20, and the sections are hingedly attached to the stick 1 by providing them with eyes or holes to receive a wire or pins. The strip of fabric 20 connecting the sections 17 may serve as the means whereby the ribs 14 can be fixed to the fabric cover 15, as by an adhesive or sewing.

The fabric covering 15 of the umbrella consists of a suitable number of sections 21 of the ordinary substantially triangular shape sewn together and joined at the top around the upper portion of the stick 1. The collapsible ribs 14, as shown, will preferably be positioned beneath the seams forming the several sections 21 of the fabric cover 15. In one of the cover sections 21 a zipper or lightning fastener 22 is inserted to allow the fabric to be separated, from the outer edge of the section 21 to the point of attachment of the fabric covering 15 near the stick 1. This allows the fabric covering 15 to be opened from the edge to the centre to facilitate the folding or collapsing and also the extending of the umbrella when it is desired to bring it into use.

The fabric covering 15 is retained in the distended and taut position on the curved ribs 14 by means of inside cords 23, one being shown employed for two adjacent ribs 14. The cords 23 are each attached at one end to one rib 14 through the medium of an eye 24. It then passes through another eye 25 fixed to the same rib 14 at or about the centre of its length, is then looped round a hook or catch 26 fixed to one section of the stick 1, then passes through another eye 27 fixed to a section 17 of an adjacent rib 14 at or about the centre of its length, and is then attached to an eye 28 at the outer end of said adjacent rib 14. All the other ribs 14 are connected in like manner to two laterally abutting sections 3, 4, of the sitck 1. The cord connections 23 serve for retaining the ribs 14 and the fabric covering 15 in position from the underside of the umbrella. In collapsing the umbrella the cords 23 are disengaged from the hooks 26, and in distending it are placed in engagement therewith. On the top or outside of the fabric covering 15 further cords 29 are provided for supporting the cover 15 and ribs 14 in the distended position. Each of the cords 29 may, as shown, be attached to and support two of the adjacent ribs 14 when the umbrella is distended or open. For this purpose the cord 29 at one end will be attached to an eye 30 fixed to one rib 14, then engage in a hole in a flange formed on a piece 31 fixed to the top end sections 3, 4, of the stick 1, and then be attached to an eye 32 fixed in a corresponding position to the adjacent rib 14.

In the modification illustrated in Figs. 9, 10 and 11, in which the sections 41, 42, of the halves 43 of the stick 44 will preferably be made of metal, said sections 41, 42, are secured together by interengaging catches 33 and bars 34. The hook-shaped catches 33 are formed on hollow sliding pieces or sleeves 35 guided in grooves or recesses 36 in the sections 41 at one side of the half 43. The bars 34 are positioned across longitudinal slots or grooves 37 in the opposing inner faces of the other sections 42 of both halves 43. The movement of all the sliding pieces 35 to cause the sliding catches 33 to engage their respective bars 34 is effected by connecting all the sliding pieces or sleeves 35 together by a cord 38 arranged longitudinally in the circular grooves or recesses 36 and adapted to be moved up and down to disengage and engage the catches 33 and bars 34. This cord 38 would extend beyond the end sections 41, 42, of the stick 44, and may be fitted with a tassel or button at each end to facilitate the pulling of the same from either end to cause the catches 33 to engage the bars 34 in order to secure the sections 41, 42 of both halves 43 in the closed position to render the structure rigid, or to disengage the same in collapsing the stick 44. The sliding pieces or sleeves 35 are constructed and arranged so that they project beyond the ends of the guiding recesses 36 in the sections 41 for a suitable distance into the recesses of the adjoining sections 41 additionally to secure or lock the sections together and stiffen the stick or render it more rigid when extended. The adjoining edges of the sections 41, 42, of the halves 43 are hinged together at one side by the longitudinal hinges 39, and abutting ends of the sections 41, 42, are connected by the hinges 40.

In bringing the folding or collapsible umbrella as shown in Figs. 1 and 2 into use the longitudinal halves 2 of the stick are folded together into engagement to render the stick 1 rigid. The zipper or lightning fastener 22 can now be operated to close the opening in the covering 15 or join the parts of the section 21 in which it is arranged, after which the cords 23 are looped or placed in engagement with the hooks 26 which has the effect of arching or curving the ribs 14 and tightening the cords 23, and at the same time tightening the outside cords 29. To fold or collapse the umbrella, the cords 23 are disengaged from the hooks 26 and the zipper or lightning fastener 22 opened. The stick 1 can then be opened in a longitudinal direction by disengaging the catches 10. The several ribs 14 and stick 1, together with the fabric covering 15, can now be rolled up into the compact collapsed form.

What I claim as my invention and desire to protect by Letters Patent is:—

1. A folding or collapsible umbrella or the like including, in combination, a collapsible stick comprising a plurality of transverse sections hinged together, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting

the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

2. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

3. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, external bands for reinforcing the ends of said sections and means fitted at the joints between the sections which interengage when the stick is extended, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

4. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into hinged sections, each section of each half being hinged longitudinally to the adjoining section of the other half, means which interengage when the sections are folded about the longitudinal hinges in extending the stick for connecting the sections, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

5. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, means which interengage when the sections are folded about their longitudinal hinges in extending the stick consisting of a part fixed to the inner side of one section and carrying a projection and a further part including a spring fixed to the inner side of the adjoining section with which the projection engages to connect the sections, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

6. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, flexible lining means for the sections which form the transverse hinges between the adjoining sections, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

7. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, flexible lining means for the sections which form the transverse hinges between the sections of each half, connections between the flexible lining means which form the longitudinal hinges between the sections, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

8. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into hinged sections, each section of each half being hinged longitudinally to the adjoining section of the other half, means which interengage when the sections are folded about the longitudinal hinges in extending the stick for connecting the sections of the two halves consisting of catches arranged in guiding recesses in the sections at one side of the stick and transverse bars formed across longitudinal grooves in the other sections with which the catches are adapted slidingly to engage and flexible means to which the catches are attached for sliding the catches in their guiding recesses, the catches being constructed to engage in the guiding recesses of the adjoining sections at the one side of the stick when in operative position, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

9. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, collapsible sectional ribs each comprising a plurality of transverse sections hinged together the ends of which are bevelled and abut when the ribs are in the extended position, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

10. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, flexible pieces which connect the sections of the ribs and form the hinges between said sections, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, as set forth.

11. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, collapsible sectional ribs

each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, and flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella including cords attached to the outer ends of the ribs, passing through guides between the ends of the ribs and detachably connected to the stick, as set forth.

12. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, and flexible means connecting the ribs intermediate their ends to the outer end of the stick, as set forth.

13. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, a cover attached to and holding said ribs when expanded, flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella, said stick projecting above the top of the cover, and means connecting the ribs intermediate their ends to the outer end of the stick including cords, eyes to which said cords are connected, and means connecting said cords to the outer end of the stick, as set forth.

14. A folding or collapsible umbrella or the like, including, in combination, a collapsible stick divided longitudinally into halves hinged together, each half being divided transversely into sections hinged together, each section of each half being hinged longitudinally to the adjoining section of the other half, flexible lining means for the sections which form the transverse hinges between the sections of each half and the longitudinal hinges between the halves, means which interengage when the sections are folded about the longitudinal hinges in extending the stick for connecting the sections, collapsible sectional ribs each comprising a plurality of transverse sections hinged together, flexible pieces which connect the sections of the ribs and form the hinges between said sections, a cover attached to and holding said ribs when expanded, flexible means connecting the sectional ribs to the sectional stick at the underside of the umbrella including cords attached to the ends of the ribs, passing through guides between the ends of the ribs and detachably connected to the stick, said stick projecting above the top of the cover, and flexible means connecting the ribs intermediate their ends to the outer end of the stick, as set forth.

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