Sept. 2, 1958 W. TRIPPE 2,850,028

COLLAPSIBLE UMBRELLA

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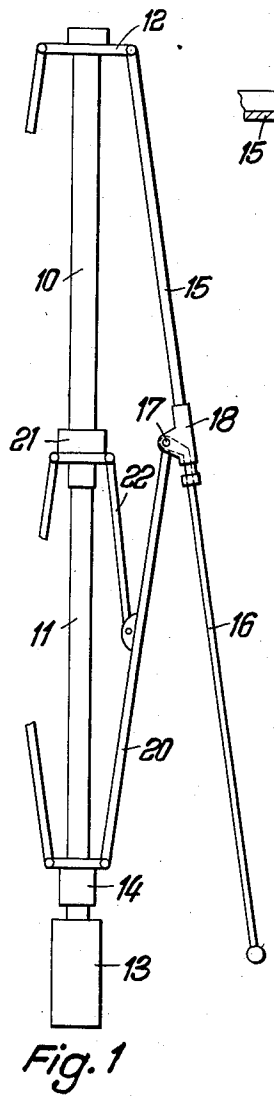
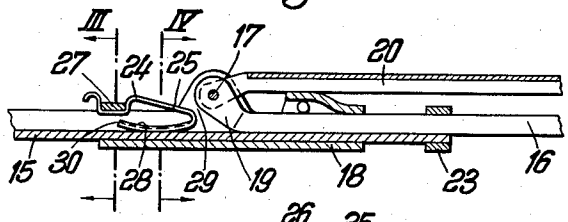


Fig. 1

Fig. 2



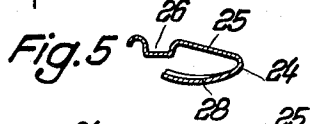


Fig. 5

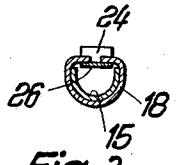


Fig. 3

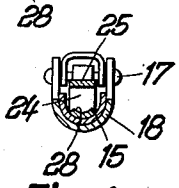


Fig. 4

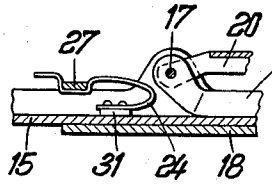


Fig. 6

Fig. 7

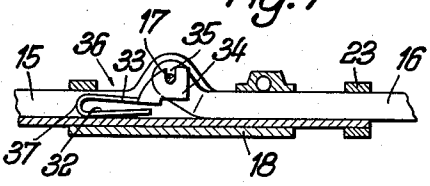
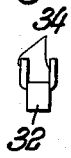


Fig. 9



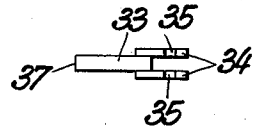


Fig. 8

Inventor:
WALTER TRIPPE
by Mestern & Kollin
ATTORNEY

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COLLAPSIBLE UMBRELLA

Walter Trippe, Krefeld, Germany, assignor to Bremshey & Co., Solingen-Ohligs, Germany

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3 Claims. (Cl. 135—26)

This invention relates to a collapsible umbrella having telescopic stick and rib parts, with main struts pivoted to the outer rib parts and auxiliary struts which are pivoted both to the main struts and also to an auxiliary slider movable along the stick. Umbrellas of this type which have proved satisfactory in use have, however, the disadvantage that on beginning to open the umbrella the rib parts are sometimes telescoped together instead of being lifted away from the stick. Many developments have been proposed and tested for the purpose of obviating this disadvantage. One method of doing so consists in attaching braking springs to guide sleeves within which one of the rib parts slides and which are used for the mutual guidance of the rib parts along each other. These springs counteract the relative movement of the parts of the ribs by acting as a brake and, therefore, ensure that the umbrella cover is opened.

Hitherto, it was not possible to arrange the spring in the very small space available within the sleeve in such a way that in the first place it produced a sufficiently strong braking effect and in the second place was held quite securely and free from misplacement and in the third place did not anywhere project so far that it interrupted to any unpermissible extent the smooth contour of the ribs and of the sleeve and did not have any projecting ends liable to damage the material of the umbrella cover.

The invention is concerned with a braking spring and mounting means therefor which fulfill the aforesaid requirements much better than previous constructions. According to the present invention, the telescoping together and drawing apart is resisted by a U-shaped braking spring, one arm of the spring being fixed to the sleeve and prevented from moving longitudinally relative to the sleeve and the other arm pressing against the rib part which slides within the sleeve.

With the known braking springs the braking effect, when telescoping the rib parts together was in general no greater than when spreading the ribs apart and in many cases was even less. This is a disadvantage since the braking action is only necessary when telescoping the rib parts together, and is undesirable when the ribs are drawn apart. In a further development of the invention a greater braking effect is obtained when the rib parts are telescoped together than when they are drawn apart, and to this end, in accordance with a further feature of the invention, the free ends of the arms of each U-shaped spring are disposed in the sleeve pointing in the direction in which the one part moves through the sleeve as the rib parts are drawn apart. Then, when telescoping the rib parts together, the free arm of the spring is, as it were, opened out away from the other arm and increases the pressure and, therefore, the friction.

Preferably the leaf-spring is secured in the sleeve both against longitudinal displacement and also against movement at right angles thereto transversely to the rib parts so that it cannot be pressed out of the sleeve by the friction forces acting in the longitudinal direction and producing a turning moment and the described opening out of the spring is kept within permissible limits.

The arrangement of the leaf-spring becomes particularly simple if one of its arms is bent to form a recess by means of which it engages in part of the sleeve. This form has a particular advantage that the shape of the sleeve need not differ from the usual shape.

Three constructional embodiments of the invention are illustrated, by way of example, in the accompanying drawing, in which:

Fig. 1 is a diagrammatic elevation of a telescopic umbrella without the cover;

Fig. 2 is a longitudinal section through the adjacent ends of the parts of a rib, together with their guide means;

Fig. 3 is a section on the line III—III in Fig. 2;

Fig. 4 is a section on the line IV—IV of Fig. 2;

Fig. 5 is a longitudinal section through the braking spring before its insertion;

Fig. 6 is a longitudinal section similar to Fig. 2 showing a modified arrangement;

Fig. 7 is a similar section through a third form of construction;

Fig. 8 is a plan of the spring used in the construction shown in Fig. 7; and

Fig. 9 is a view of the spring from one end.

Referring to the drawing, the stick of the umbrella shown in Fig. 1 consists of two parts **10** and **11** which are telescopically insertible one in the other. The part **10** carries the crown **12** and the other part **11** carries the handle **13**. A main slider **14** is movable along the stick. The main slider can be locked in position on the stick by means, which are not illustrated, in the positions which it occupies when the umbrella is open and closed. The ribs, which are pivoted to the crown **12**, consist of telescopically movable parts **15** and **16**. The part **15** is U-shaped in cross-section, and, when the umbrella is collapsed, receives the part **16** which is of circular cross-section. A guide sleeve **18** is fixed by means of a pin **17** at the inner end of the outer rib part **16** in the manner illustrated in Fig. 2. The guide sleeve, in the example illustrated, is bent from stamped sheet metal. It can, however, also be made of plastic or other material. The pin **17** passes through the bent end **19** of the part **16** and serves at the same time as a pivot for the main strut **20**, each of which is pivoted to the main slider **14**. An auxiliary slider **21** is also movable along the stick. The auxiliary slider is connected to each main strut **20** by an auxiliary strut **22**. The relative movement of the rib parts is limited by a ring **23** fixed at the outer end of the part **15**.

When the umbrella is completely closed the ribs do not lie at a distance from the stick as shown in Fig. 1, but are close to the stick. When the umbrella is opened there is a danger that the struts **20** will telescope the rib parts instead of spreading them out from the stick. This is prevented by braking springs which are illustrated in Figs. 2 to 9 and which are disposed within the sleeve **18**.

In Figs. 2–5 the spring **24** consists of a U-shaped leaf of spring steel, one arm **25** of which is provided with a bent recess **26**. To insert this spring in position in the umbrella, the spring is placed in the space within the rib part **15** to the left (in Fig. 2) of the sleeve **18** and is then pushed along the rib towards the sleeve. When it meets the ring-shaped end **27** of the sleeve **18** the spring is compressed and on further movement finally arrives in the position illustrated in which the bend **26** snaps automatically into engagement with the part **27** of the sleeve **18**.

When the rib parts are moved relatively to one another the spring **24** remains connected to the sleeve **18**, whereas the U-shaped rib part **15** slides through the sleeve. The free arm **28** of the spring then presses against the bottom of the hollow rib part **15** and produces a friction which counteracts the movement. When the ribs are pushed together, assuming the rib part **15** to be stationary, the rib part **16** moves towards the left in Fig. 2. The free end **28** of the spring is thereby slightly opened out by the frictional force so that the friction is greater than with movement in the opposite direction, that is to say when extending the umbrella when no opening out takes place.

The spring **24** projects below the bent head **19** of the rib part **16** which secures it against movement transverse to the rib and prevents the compression of the spring from being excessive when the rib parts **15** and **16** are telescoped. By suitably adjusting the distance **29** between the spring and the part **19** the degree of opening out of the spring can be suitably determined. It has been found that a relatively small distance gives good results.

The cross-section of the free arm **28** of the spring as shown in Fig. 4, conforms with the shape of the rib part **15** Its curvature can be somewhat greater than the curvature of the U-profile of the rib so that there is substantially only point contact between the spring and the rib. The outermost end of the free arm is bent upwards slightly as shown at **30**.

The construction shown in Fig. 6 is similar to that of Figs. 2–5, except that a brake shoe **31** is fixed to the free arm **28** of the spring. The brake shoe may consist of friction material which increases the braking effect and only wears away slightly.

In the construction shown in Figs. 7–9, a U-shaped leaf spring **32** is also used for braking but with the spring disposed the other way round so that in this case the braking effect on extending the umbrella is not smaller than on collapsing it. As shown in Figs. 8 and 9, the spring is provided at the end of the upper arm **33** with upwardly bent lugs **34** having recesses **35** by means of which it engages under the pin **17**. To insert the spring its head **37** is introduced through an opening **36** already existing in the sleeve **18** and it is then pushed to the left, after which it is again pushed to the right until the recesses **35** come into engagement with the pin **17**. The strut **20** is not shown in Fig. 7. It is connected in the same way as in Figs. 2 and 6.

I claim:

1. A collapsible umbrella comprising a stick and ribs, said stick comprising at least two parts which can be telescoped together and drawn apart, and said ribs comprising outer parts and inner parts which can also be telescoped together and drawn apart, a sleeve provided with a ring-shaped end, said sleeve being adapted for guiding said inner and outer rib parts along each other, said sleeve being fixed to one of said rib parts and the other of said parts being slidable within said sleeve, a main slider and an auxiliary slider both slidably mounted on said stick, main struts pivoted in connection with said outer rib parts and to said main slider, auxiliary struts pivotally connected to said main struts and to said auxiliary slider and a U-shaped braking spring for resisting the telescoping together of said inner and outer rib parts, said spring having one arm with a bent recess

formed therein, said recess receiving the ring-shaped end for anchoring said sleeve to said spring and for preventing the latter from moving longitudinally relative to said sleeve and a second arm pressing against said rib part which slides in said sleeve, said one arm and said second arm pointing in the direction in which said rib part which slides in said sleeve moves through said sleeve as said inner and outer rib parts are drawn apart.

2. A collapsible umbrella comprising a stick and ribs, said stick comprising at least two parts which can be telescoped together and drawn apart, and said ribs comprising inner parts of channel shaped cross-section and outer parts which slide within said inner parts, a sleeve provided with a ring-shaped end, said sleeve being fixed to said outer part and surrounding said inner part for guiding said inner and outer rib parts along each other, a main slider and an auxiliary slider both slidably mounted on said stick, main struts pivotally connected to said outer rib parts and to said main slider, auxiliary struts pivotally connected to said main struts, and to said auxiliary slider and a U-shaped braking spring for resisting the telescoping together of said inner and outer rib parts, said spring having one arm with a bent recess formed therein, said recess receiving the ring-shaped end for anchoring said sleeve to said spring and for preventing the latter from moving longitudinally relative to said sleeve and a second arm pressing against said inner part of channel-shaped cross-section, said one arm and said second arm pointing in the direction in which said rib part which slides in said sleeve moves through said sleeve as said inner and outer rib parts are drawn apart.

3. A collapsible umbrella comprising a stick and ribs, said stick comprising at least two parts which can be telescoped together and drawn apart, and said ribs comprising inner parts of channel shaped cross-section and outer parts which slide within said inner parts, a sleeve provided with a ring-shaped end, said sleeve being fixed to said outer part and surrounding said inner part for guiding said inner and outer rib parts along each other, a main slider and an auxiliary slider both slidably mounted on said stick, main struts pivotally connected to said outer rib parts and to said main slider, auxilary struts pivotally connected to said main struts, and to said auxiliary slider and a U-shaped braking spring of the leaf-type for resisting the telescoping together of said inner and outer rib parts, said spring having one arm with a bent recess formed therein, said recess receiving the ring-shaped end for anchoring said sleeve to said spring and for preventing the latter from moving longitudinally relative to said sleeve and a second arm pressing against said inner part of channel-shaped cross-section, said one arm and said second arm pointing in the direction in which said rib part which slides in said sleeve moves through said sleeve as said inner and outer rib parts are drawn apart.

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