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(54) **Automatic spreading umbrella**

(57) An umbrella includes a handle shaft (40) has a tubular top end portion (40T) with a distal end surface and a stop member (42) disposed in the top end portion (40T) and spaced apart from the distal end surface. A hub (60) is mounted on the top end portion (40T) of the handle shaft (40). A lower runner (50) is mounted slidably on the handle shaft (40) and is movable toward and away from the hub (60). A rib assembly (80) is mounted pivotally at one end on the hub (60). A stretcher assembly (100) is connected operably to the rib assembly (80) and the lower runner (50). An upper runner (70) has an enlarged head (72) disposed above the hub (60), and a guide shaft (71) that extends from the enlarged head (72) and into the tubular top end portion (40T) of the handle shaft (40). A compression spring (90) is sleeved on the guide shaft (71) of the upper runner (70), and has a bottom end that is disposed in the top end portion (40T) of the handle shaft (40) and that abuts against the stop member (42), and a top end that extends outwardly of the top end portion (40T) of the handle shaft (40) and that abuts against the head (72) of the upper runner (70). A spreader assembly (200) is connected operably to the rib assembly (80) and the head (72) of the upper runner (70).

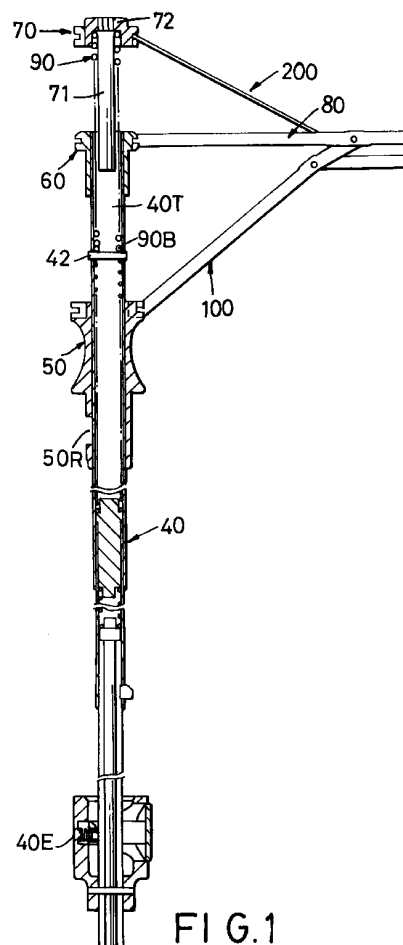


FIG. 1

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Description

[0001] The invention relates to an umbrella, more particularly to an automatic spreading umbrella with a handle shaft of considerable strength to prevent bending and breakage thereof.

[0002] A first conventional umbrella includes a spring-loaded telescopic handle shaft, a hub mounted on a top end portion of the handle shaft, a rib assembly mounted pivotally at one end to the hub, a lower runner mounted slidably on the handle shaft and movable toward and away from the hub, an upper runner mounted slidably on the handle shaft between the hub and the lower runner, and a stretcher assembly connected operably to the rib assembly and the lower and upper runners. First and second rib spreading coil springs are sleeved on the handle shaft in such a manner that the first rib spreading coil spring is disposed between the hub and the upper runner while the second rib spreading coil spring is disposed between the upper and lower runners. When the lower runner is moved away from the hub, such as when folding the umbrella, the stretcher assembly will pull the rib assembly downward to a retracted position, thereby compressing the first and second springs in an axial direction of the handle shaft. When the lower runner is moved toward the hub, the stretcher assembly will push the rib assembly, thereby releasing the first and second spring from compression and consequently permitting the rib assembly to be disposed in a stretched state.

[0003] Note that the presence of the first and second springs around the handle shaft prevents the rib assembly to be retracted closely relative to the latter, thereby rendering the size of the folded umbrella to be relatively bulky.

[0004] A second conventional umbrella includes a spring-loaded telescopic handle shaft, a hub fixed to a top end portion of the handle shaft, a lower runner mounted slidably on the handle shaft, a rib assembly mounted pivotally at one end to the hub, an upper runner mounted slidably on the handle shaft above the lower runner, and a stretcher assembly connected operably to the rib assembly and the upper and lower runners such that the umbrella can be operated so as to dispose the same in unfolded or folded states.

[0005] It is noted that the wall surface confining the top end portion of the handle shaft formed with an axial slot. A slide pin extends through a wall body of the upper runner and the slot so as to limit axial sliding movement of the upper runner on the handle shaft. Formation of the slot weakens the strength of the handle shaft. The longer the slot, the weaker the handle shaft will become.

[0006] Therefore, the object of this invention is to provide an automatic spreading umbrella which can overcome the aforementioned disadvantages that are associated with the conventional umbrellas.

[0007] Accordingly, an umbrella of this invention includes a handle shaft, a hub, a lower runner, a rib

assembly, a stretcher assembly, an upper runner, a coiled compression spring, and a spreader assembly. The handle shaft has a tubular top end portion with a distal end surface and a stop member disposed in the top end portion and spaced apart from the distal end surface. The hub is mounted on the top end portion of the handle shaft. The lower runner is mounted slidably on the handle shaft and is movable toward and away from the hub. The rib assembly is mounted pivotally at one end on the hub. The stretcher assembly is connected operably to the rib assembly and the lower runner. The upper runner has an enlarged head disposed above the hub, and a guide shaft that extends from the enlarged head and into the tubular top end portion of the handle shaft. The compression spring is sleeved on the guide shaft of the upper runner, and has a bottom end that is disposed in the top end portion of the handle shaft and that abuts against the stop member, and a top end that extends outwardly of the top end portion of the handle shaft and that abuts against the head of the upper runner. The spreader assembly is connected operably to the rib assembly and the head of the upper runner. When the lower runner is moved away from the hub, the stretcher assembly will pull the rib assembly to a folded state, thereby causing the rib assembly to pull the spreader assembly and move the head of the upper runner toward the hub and compress the compression spring. When the compression spring expands and pushes the upper runner away from the hub, the spreader assembly will pull the rib assembly to a stretched state, thereby pulling the stretcher assembly to move the lower runner toward the hub.

[0008] Other features and advantages of this invention will become more apparent in the following detailed description of the preferred embodiment of this invention, with reference to the accompanying drawings, in which:

Figure 1 is a schematic fragmentary sectional view of a preferred embodiment of an umbrella of this invention, wherein the canopy is removed for the sake of clarity; and

Figure 2 is a schematic fragmentary sectional view of the preferred embodiment in a folded state.

[0009] Referring to Figures 1 and 2, the preferred embodiment of an automatic spreading umbrella of this invention is shown to include a handle shaft (40), a hub (60), a lower runner (50), a rib assembly (80), a stretcher assembly (100), an upper runner (70), a coiled compression spring (90), and a spreader assembly (200).

[0010] The handle shaft (40) is a known spring-loaded telescopic handle shaft that has a tubular top end portion (40T) with a distal end surface. A stop member (42) is disposed in the top end portion (40T) and is spaced apart from the distal end surface.

[0011] The hub (60) is mounted securely on the top

end portion (40T) of the handle shaft (40).

[0012] The lower runner (50) is mounted slidably on the handle shaft (40) and is movable toward and away from the hub (60). The lower runner (50) can be locked releasably on the handle shaft (40) in a known manner so as to retain the umbrella in a folded state (see Fig.2). In the preferred embodiment, the lower runner (50) is preferably provided with a radial notch (50R). The handle shaft (40) is provided with a spring-biased catch (40E) at a lower portion thereof to engage the notch (50R) of the lower runner (50), thereby locking the lower runner (50) on the handle shaft (40). Operation of the catch (40E) will result in release of the lower runner (50) from the locked state.

[0013] The rib assembly (80) is mounted pivotally at one end on the hub (60) in a conventional manner. A canopy (not shown) is mounted on the rib assembly (80) in a manner that is known in the art.

[0014] The stretcher assembly (100) is connected operably to the rib assembly (80) and the lower runner (50) in a known manner.

[0015] The upper runner (70) has an enlarged head (72) disposed above the hub (60), and a guide shaft (71) that extends from the enlarged head (72) and into the tubular top end portion (40T) of the handle shaft (40).

[0016] The compression spring (90) is sleeved on the guide shaft (71), and has a bottom end (90B) that is disposed in the top end portion (40T) of the handle shaft (40) and that abuts against the stop member (42), and a top end (90T) that extends outwardly of the top end portion (40T) of the handle shaft (40) and that abuts against the head (72) of the upper runner (70).

[0017] The spreader assembly (200) is connected operably to the rib assembly (80) and the head (72) of the upper runner (70).

[0018] When the lower runner (50) is moved away from the hub (60), such as when disposing the umbrella in the folded state as shown in Figure 2, the stretcher assembly (100) will pull the rib assembly (80) to the folded state, thereby causing the rib assembly (80) to pull the spreader assembly (200) and move the head (72) of the upper runner (70) toward the hub (60) and compress the compression spring (90). The lower runner (50) can be locked on the handle shaft (40) at this time.

[0019] When the lower runner (50) is released from the locked state, the compression spring (90) expands and pushes the upper runner (70) away from the hub (60). The spreader assembly (200) then pulls the rib assembly (80) to a stretched state, as best shown in Figure 1, thereby pulling the stretcher assembly (100) to move the lower runner (50) toward the hub (60).

[0020] The stop member (42) can be a pin which extends through a radial hole formed through the top end portion (40T) of the handle shaft (40). Alternatively, the stop member (42) can be formed integrally with the top end portion (40T).

[0021] Note that no axial slot is formed through a wall body that confines the top end portion of the handle shaft so that the rigidity and strength thereof are not affected. The object of the invention is accordingly achieved.

Claims

1. An umbrella comprising:

- a handle shaft (40) having a top end portion (40T);
- a hub (60) mounted on the top end portion (40T) of the handle shaft (40);
- a lower runner (50) mounted slidably on the handle shaft (40) and movable toward and away from the hub (60);
- a rib assembly (80) mounted pivotally at one end on the hub (60);
- a stretcher assembly (100) connected operably to the rib assembly (80) and the lower runner (50);
- an upper runner (70) disposed above the hub (60) and upwardly of the top end portion (40T) of the handle shaft (40);
- a spreader assembly (200) connected operably to the rib assembly (80) and the upper runner (70); and
- biasing means (90) for biasing the upper runner (70) away from the hub (60).

2. An umbrella comprising:

- a handle shaft (40) having a tubular top end portion (40T) with a distal end surface and a stop member (42) disposed in the top end portion (40T) and spaced apart from the distal end surface;
- a hub (60) mounted on the top end portion (40T) of the handle shaft (40);
- a lower runner (50) mounted slidably on the handle shaft (40) and movable toward and away from the hub (60);
- a rib assembly (80) mounted pivotally at one end on the hub (60);
- a stretcher assembly (100) connected operably to the rib assembly (80) and the lower runner (50);
- an upper runner (70) having an enlarged head (72) disposed above the hub (60), and a guide shaft (71) that extends from the enlarged head (72) and into the tubular top end portion (40T) of the handle shaft (40);
- a coiled compression spring (90) sleeved on the guide shaft (71), and having a bottom end (90B) that is disposed in the top end portion (40T) of the handle shaft (40) and that abuts against the stop member (42), and a top end

(90T) that extends outwardly of the top end portion (40T) of the handle shaft (40) and that abuts against the head (72) of the upper runner (70); and

a spreader assembly (200) connected operably 5
to the rib assembly (80) and the head (72) of the upper runner (70); wherein

when the lower runner (50) is moved away from the hub (60), the stretcher assembly (100) will pull the rib assembly (80) to a folded state, 10
thereby causing the rib assembly (80) to pull the spreader assembly (200) and move the head (72) of the upper runner (70) toward the hub (60) and compress the compression spring (90); and 15

when the compression spring (90) expands and pushes the upper runner (70) away from the hub (60), the spreader assembly (200) will pull the rib assembly (80) to a stretched state, 20
thereby pulling the stretcher assembly (100) to move the lower runner (50) toward the hub (60).

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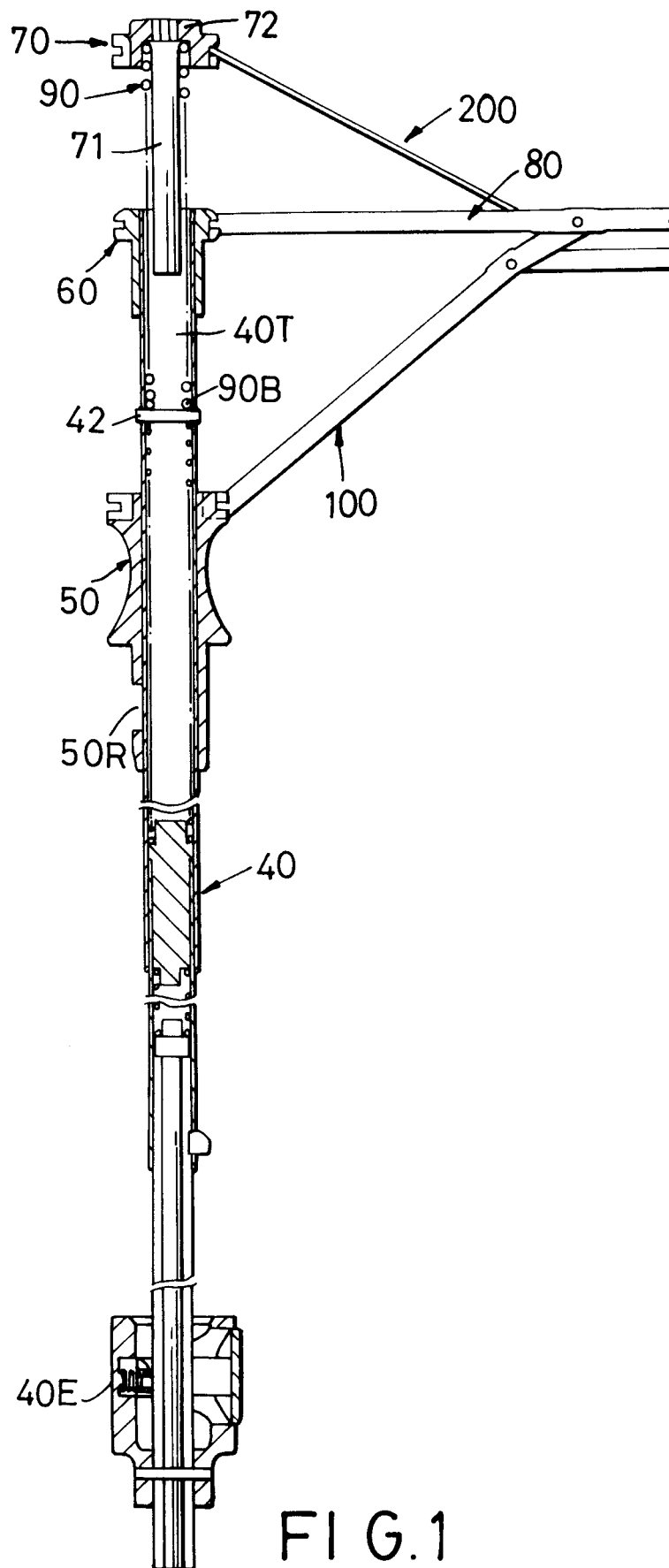
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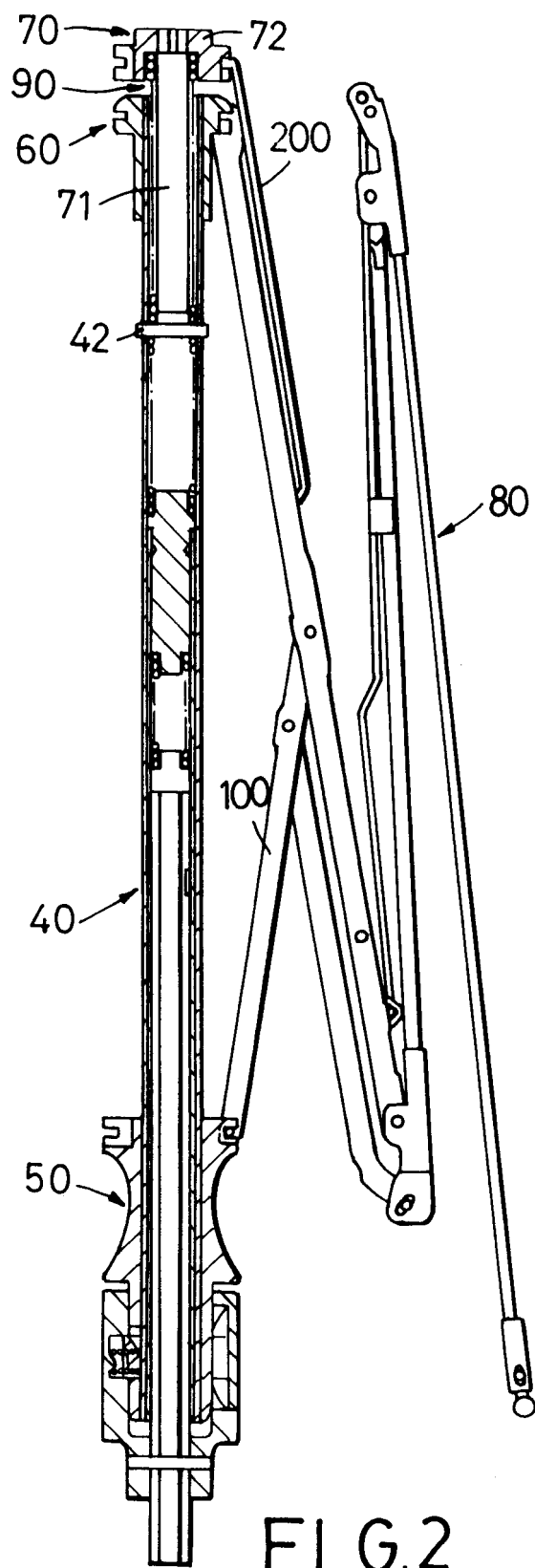
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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 6395

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 5 247 955 A (WU WOH-WEN) 28 September 1993 * column 2, line 1 - column 4, line 67; figures 1,2 *	1,2	A45B25/16
X	US 5 232 004 A (WU WOH-WEN) 3 August 1993 * column 4, line 60 - column 5, line 5; figures 1-4 *	1,2	
X	US 5 533 541 A (CHENG JONATHAN ET AL) 9 July 1996 * column 2, line 59 - column 3, line 50; figures 1,2,5 *	1,2	
X	US 4 548 222 A (DAY SAN-TONG) 22 October 1985 * column 4, line 43 - column 5, line 13; figures 1-3 *	1	
A		2	
X	US 5 361 792 A (LIN CHUNG-KUANG ET AL) 8 November 1994 * column 2, line 61 - column 3, line 6; figures 1-6 *	1	
A		2	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	EP 0 525 227 A (DAY SHENG TONG) 3 February 1993 * column 5, line 28 - column 6, line 1; figures 1,3 *	1	A45B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 December 1998	Examiner Acerbis, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 6395

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-12-1998

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5247955 A	28-09-1993	NONE	
US 5232004 A	03-08-1993	NONE	
US 5533541 A	09-07-1996	NONE	
US 4548222 A	22-10-1985	EP 0151847 A AU 2426784 A GB 2154136 A ZA 8400933 A	21-08-1985 15-08-1985 04-09-1985 07-08-1984
US 5361792 A	08-11-1994	CA 2132600 A	04-11-1995
EP 0525227 A	03-02-1993	CA 2047974 A,C KR 9311708 B US 5088512 A AU 632448 B AU 8131591 A	27-01-1993 18-12-1993 18-02-1992 24-12-1992 24-12-1993