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(54) **Automatic umbrella with a closing signaling device**

(57) An automatic umbrella has a signaling device (100) including sensor and alert units (10,20). The sensor unit (10) has a first sensor (11) mounted on one of a handle (400) and a lower end (2301) of a central shaft (200), and a second sensor (12) which is movable with a runner (300) and which is configured to activate the sensor unit (10) to emit a signal once a predetermined spatial relationship is established between the first and second sensors (11,12) as a result of movement of the second sensor toward said first sensor (11) once the runner (300) is moved to reach the handle (400). The alert unit (20) is mounted on the handle (400) to receive the signal and generate an alert indication to indicate that the umbrella is in a closed state.

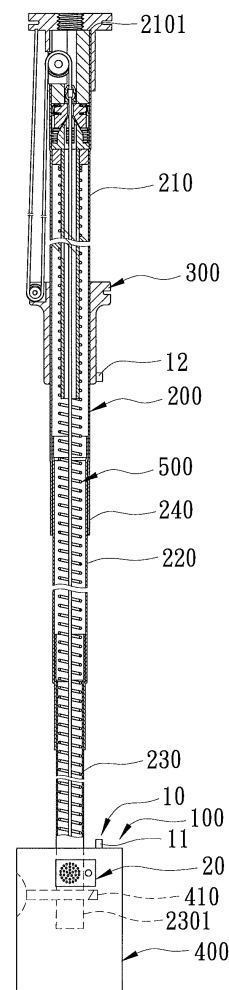


FIG. 2

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Description

[0001] This invention relates to an automatic umbrella, more particularly to an automatic umbrella with a closing signaling device.

[0002] Referring to Fig. 1, a conventional automatic umbrella capable of automatic opening and closing disclosed in Taiwanese Utility Model Publication No. 354874 is shown to include a frame 1, an opening spring 2 mounted in a central shaft 101 of the frame 1, a handgrip 3 mounted on a lower end of the central shaft 101, a control unit 4 mounted in the handgrip 3, and a transmitting mechanism 5 coupling the handgrip 3 to the frame 1. The frame 1 includes the central shaft 101, which has a plurality of telescopic shaft sections, a top hub 102 secured on an uppermost end of the central shaft 101, a runner 103 slidably mounted on the central shaft 101, and a plurality of ribs 104 pivotally mounted between the top hub 102 and the runner 103. The control unit 4 has a biased lever 401 pivotally mounted on the handgrip 3, and a button 402 operable to move the lever 401 such that, when the central shaft 101 is telescopically folded, the lever 401 is brought to engage an upper shaft section 101', and such that, when the button 402 is pressed, the lever 401 is disengaged from the upper shaft section 101' so that the shaft sections of the central shaft 101 are extended upwardly by means of the opening spring 2, and the runner 103 is then moved toward the top hub 102 by means of the transmitting mechanism 5 so as to spread the ribs 104 for opening the umbrella. When it is desired to close the umbrella, the button 402 is pressed, and a lower end of the lever 401 is brought to move a biased plate 403 so as to release a retaining member 501 of the transmitting mechanism 5 from the biased plate 403 to thereby permit downward movement of the runner 103 for collapsing the ribs 104. Subsequently, the central shaft 101 can be pushed down and folded until the upper shaft section 101' reaches the lever 401 and is retained thereby.

[0003] However, when pushing down the central shaft 101 for telescopically folding the same, the user needs to apply a relatively large force to the central shaft 101 to overcome a biasing action of the opening spring 2. If the user inadvertently lets the umbrella slip from his/her grasp during pushing, the central shaft 101 may extend and the ribs 104 may spread instantly, which may result in damage to the umbrella and injury to the user and people nearby.

[0004] The above drawbacks are also presented in the umbrellas disclosed in Taiwanese Publication Nos. 560268, 375888, and 371852.

[0005] An object of the present invention is to provide an automatic umbrella which has a closing signaling device to indicate a user that the umbrella has been placed in a closed state.

[0006] According to this invention, the automatic umbrella includes a central shaft, a handle securely mounted on a lower end of the central shaft, a runner which is

slidably sleeved on the central shaft and which is movable between proximate and distal positions that correspond respectively to closed and opened states of the umbrella, an opening spring disposed to bias the runner to move to the distal position, and a retaining unit disposed to releasably retain the runner relative to the handle against a biasing action of the opening spring when the runner is in the proximate position. The automatic umbrella further includes a signaling device which includes a sensor unit and an alert unit. The sensor unit has a first sensor which is mounted on one of the handle and the lower end of the central shaft, and a second sensor which is configured to activate the sensor unit to emit a signal once a predetermined spatial relationship is established between the first and second sensors as a result of movement of the second sensor toward the first sensor, and which is mounted to be movable with the runner such that, once the runner is moved to reach the proximate position, the sensor unit emits the signal. The alert unit is mounted on the handle to receive the signal and generate an alert indication.

[0007] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment of the invention, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view of a conventional automatic umbrella in a telescopically folded state;

Fig. 2 is a partly sectioned schematic view of the preferred embodiment of an automatic umbrella according to this invention;

Fig. 3 is a partly sectioned schematic view of the preferred embodiment when telescopically folded; and

Fig. 4 is a partly sectioned schematic view of the preferred embodiment in a modified form.

[0008] Referring to Figs. 2 and 3, the preferred embodiment of an automatic umbrella according to the present invention is shown to comprise a central shaft 200 extending along an axis, a handle 400 securely mounted on a lower end 2301 of the central shaft 200, a runner 300 slidably mounted on the central shaft 200 and movable between proximate and distal positions that respectively correspond to closed and opened states of the umbrella, an opening spring 500 disposed to bias the runner 300 to move to the distal position, and a retaining unit. In this embodiment, the central shaft 200 is composed of upper tube 210, a middle tubular segment 220, and a lower tube 230 telescopically fitted to one another. The upper tube 210 has an upper end 2101 and an upper middle segment 2102 telescopically fitted to the middle tubular segment 220. The lower tube 230 has the lower end 2301 that has the handle 400 mounted thereon. The retaining unit includes a retained hole 240 formed in the upper middle segment 2102 of the upper tube 210, and a retainer 410 which is disposed on the handle 400 and which is releasably retained in the retained hole 240 so

as to secure the upper tube 210 to the handle 400 against the biasing action of the opening spring 500 when the runner 300 is in the proximate position and when the central shaft 200 is in a telescopically folded state.

[0009] The umbrella according to this invention further comprises a signaling device 100 that includes a sensor unit 10 and an alert unit 20.

[0010] The sensor unit 10 has a first sensor 11 mounted on the handle 400, and a second sensor 12 mounted on the runner 300 to be moved with the runner 300. The sensor unit 10 may be a contact-type switch, a photo-sensitive switch, an electromagnetic sensing switch, a micro-switch, etc. Alternatively, the first sensor 11 may be mounted on the lower end 2301 of the lower tube 230. The second sensor 12 is configured to activate the sensor unit 10 to emit a signal once a predetermined spatial relationship is established between the first and second sensors 11,12 as a result of movement of the second sensor 12 toward the first sensor 11. For example, the predetermined spatial relationship is established when there is a physical contact between the first and second sensors 11, 12 in the case that the sensor unit 10 is a contact-type switch or a micro-switch. The predetermined spatial relationship may be established when there is a predetermined distance between the first and second sensors 11,12 in the case that the sensor unit 10 is a light-inducting switch or an electromagnetic sensing switch. Thus, once the runner 300 is moved to reach the proximate position, the sensor unit 10 will emit a signal. The alert unit 20 is mounted on the handle 400 to receive the signal and generate an alert indication. The alert indication may be light or sound.

[0011] When it is desired to close and telescopically fold the umbrella, the runner 300 is pulled down toward the handle 400 to the proximate position. The middle tubular segment 220 is retracted into the upper tube 210, the lower tube 230 is retracted into the middle tubular segment 220, and the retainer 410 is engaged with the retained hole 240. At this time, the predetermined spatial relationship between the first and second sensors 11, 12 is established such that a signal is emitted and is received by the alert unit 20, which generates an alert indication for indicating to the user that the umbrella is in a closed and folded state. Hence, undesirable extension and opening of the umbrella, which may cause injury to the user or people nearby, can be avoided.

[0012] Referring to Fig. 4, alternatively, the second sensor 12 may be mounted on the upper middle segment 210 of the central shaft 200.

[0013] It is noted that the umbrella according to this invention may include a central shaft 200 which is unfoldable, i.e., the central shaft 200 is in the form of a single-piece shaft. In this case, the first sensor 11 of the sensor unit 10 of the signaling device 100 may be mounted on one of the handle 400 and a lower end of the central shaft 200, and the second sensor 12 may be mounted on the runner 300. When the umbrella is closed and the runner 300 is pulled down toward the handle 400, a pre-

determined spatial relationship is established between the first and second sensors 11,12 to generate an alert indication.

Claims

1. An automatic umbrella comprising:

a central shaft (200) having upper and lower ends (2101,2301) opposite to each other along an axis;
a handle (400) securely mounted on said lower end (2301) of said central shaft (200);
a runner (300) slidably sleeved on said central shaft (200) and movable between proximate and distal positions that correspond respectively to closed and opened states of said umbrella;
an opening spring (500) disposed to bias said runner (300) to move to the distal position; and
a retaining unit (410,240) disposed to releasably retain said runner (300) relative to said handle (400) against a biasing action of said opening spring (500) when said runner (300) is in the proximate position, **characterized by:**

a signaling device (100) including:
a sensor unit (10) having a first sensor (11) which is mounted on one of said handle (400) and said lower end (2301) of said central shaft (200), and a second sensor (12) which is configured to activate said sensor unit (10) to emit a signal once a predetermined spatial relationship is established between said first and second sensor (11, 12) as a result of movement of said second sensor (12) toward said first sensor (11), and which is mounted to be movable with said runner (300) such that, once said runner (300) is moved to reach the proximate position, said sensor unit (10) emits the signal; and
an alert unit (20) mounted on said handle (400) to receive the signal and generate an alert indication.

2. The automatic umbrella according to Claim 1, **characterized in that** said predetermined spatial relationship is established when there is a physical contact or a predetermined distance between said first and second sensors (11,12).

3. The automatic umbrella according to Claim 1, **characterized in that** the alert indication generated by said alert unit (20) is light.

4. The automatic umbrella according to Claim 1, **characterized in that** the alert indication generated by

said alert unit (20) is sound.

5. The automatic umbrella according to Claim 1, **characterized in that** said second sensor (12) is mounted on said runner (300).

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6. The automatic umbrella according to Claim 1, **characterized in that** said central shaft (200) includes upper and middle tubular segments (2102,220) which are interposed between said upper and lower ends (2101,2301) and which are telescopically fitted to each other, said second sensor (12) being mounted on said upper tubular segment (2102).

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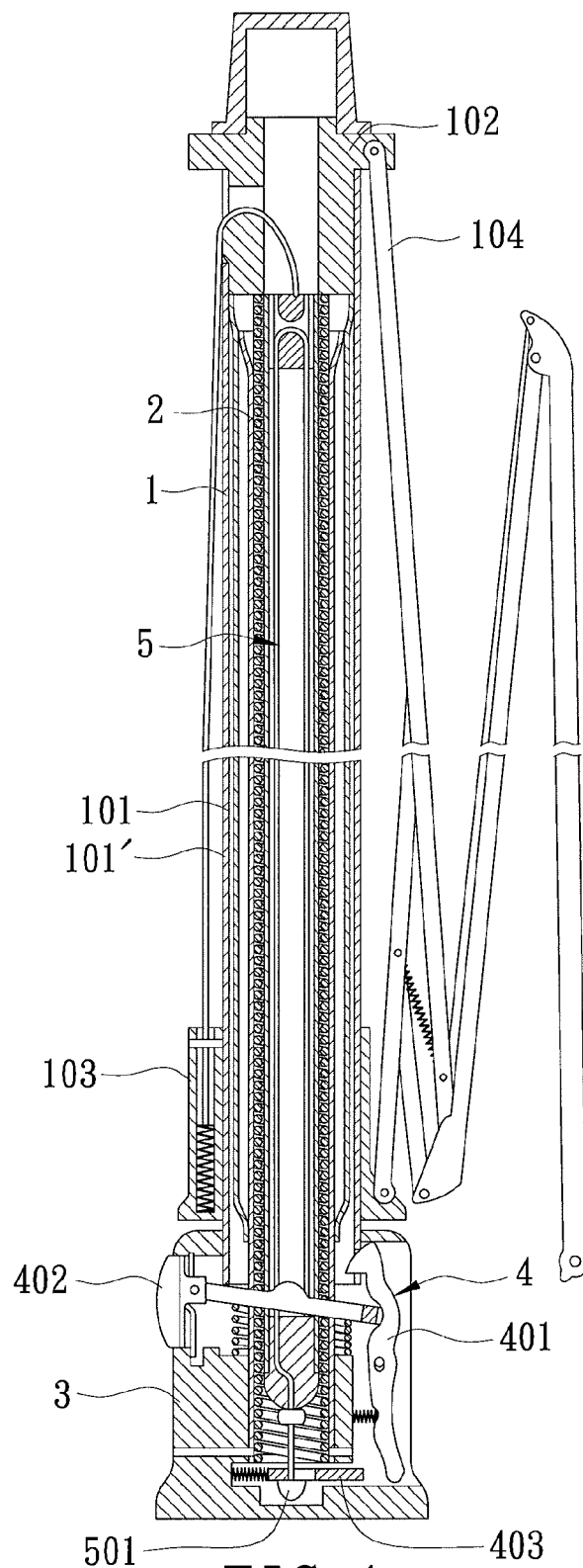


FIG. 1
PRIOR ART

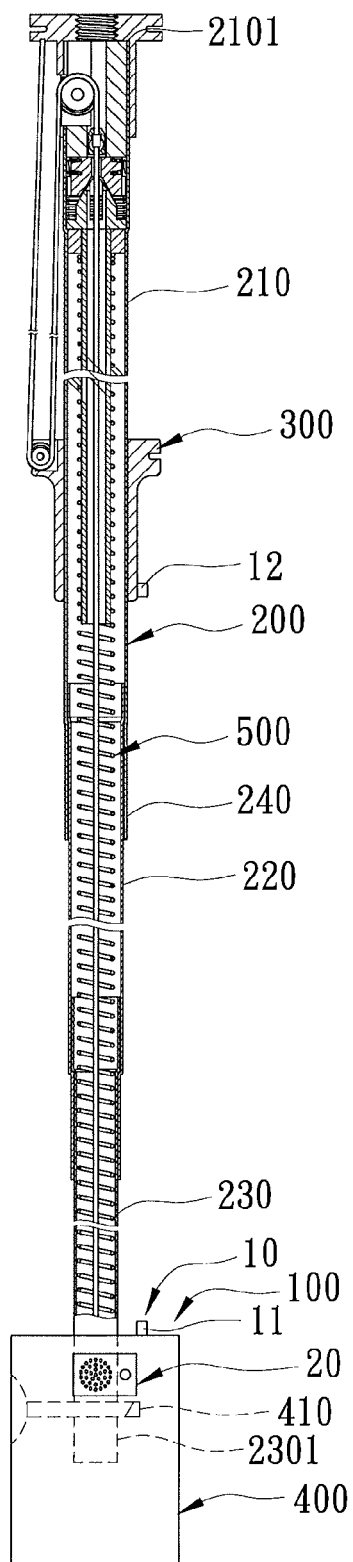


FIG. 2

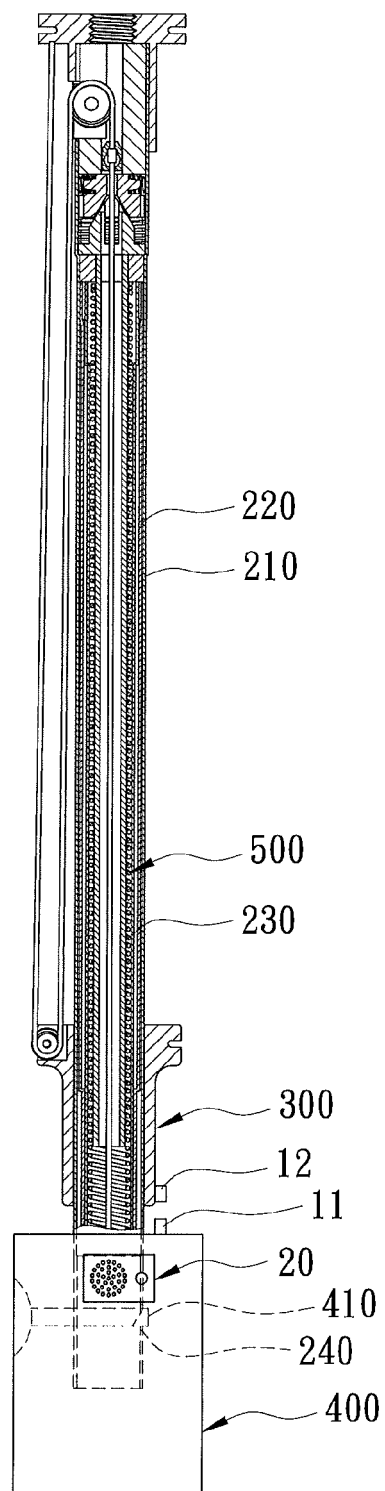


FIG. 3

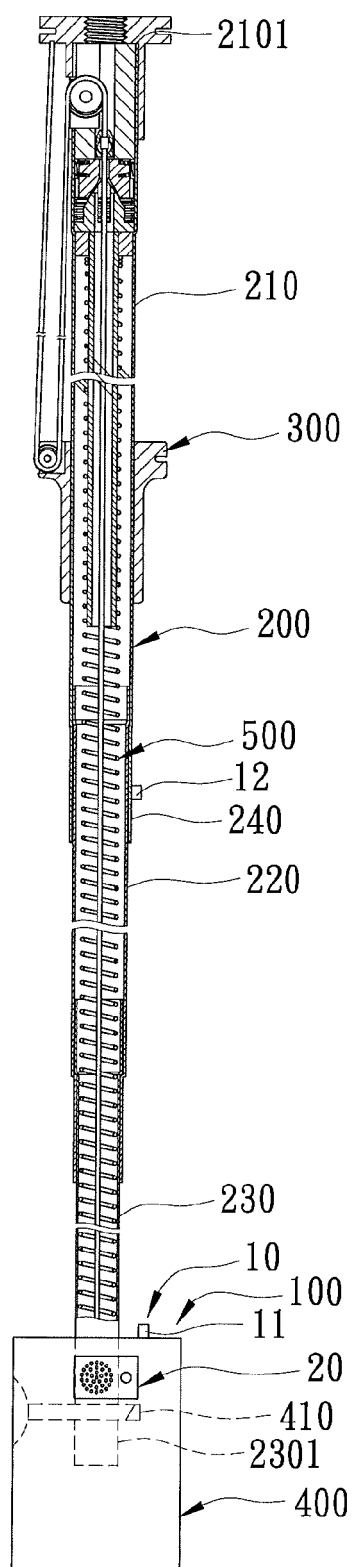


FIG. 4



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 7383

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2008/087310 A1 (DAHINDEN RENE [CH]) 17 April 2008 (2008-04-17) * paragraphs [0009], [0016], [0022], [0023], [0025], [0028], [0029] * * figures 1, 2a * -----	1-6	INV. A45B3/04 A45B9/02 A45B23/00 A45B25/00
X	US 2004/055627 A1 (P MOGA MICHAEL [US]) 25 March 2004 (2004-03-25) * paragraphs [0006], [0010], [0023], [0024], [0048], [0051] - [0055] * * figures 5, 6 * -----	1-6	
X	US 6 058 951 A (WILSON ROBERT JOE [US]) 9 May 2000 (2000-05-09) * column 1, line 41 - column 2, line 12 * * column 3, lines 36-52 * -----	1-6	
A	TW 354 874 U (JOU, LUNG-JIAU (TW); LIN, JIN-YI (TW)) 21 March 1999 (1999-03-21) * abstract * * figures 1-10 * -----	1-6	
A	GB 2 052 037 A (GARD E) 21 January 1981 (1981-01-21) * the whole document * -----	1-6	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 October 2010	Examiner Faymann, Juan
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.**

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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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25-10-2010

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REFERENCES CITED IN THE DESCRIPTION

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- TW 354874 [0002]
- TW 560268 [0004]
- TW 375888 [0004]
- TW 371852 [0004]