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(54) **OPERATION SYSTEM FOR OUTDOOR UMBRELLA**

(52) **U.S. Cl. .... 135/20.3**

(57) **ABSTRACT**

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An outdoor umbrella includes an umbrella frame, an awning element, and an operation system. The umbrella frame includes a supporting frame and an awning frame adapted to fold between an opened position and a closed position. The operation system includes an operational controller supported at the supporting frame, a pulley unit supported within the umbrella frame in a hidden manner; and an elongated controlling element running from the operational controller to the awning frame through the pulley unit and defining an operation length between the operational controller and the awning frame. When the operational controller is actuated to shorten the operation length of the controlling element, the awning frame is pivotally folded at the closed position. When the operational controller is actuated to extend the operation length of the controlling element, the awning frame is pivotally folded at the opened position.

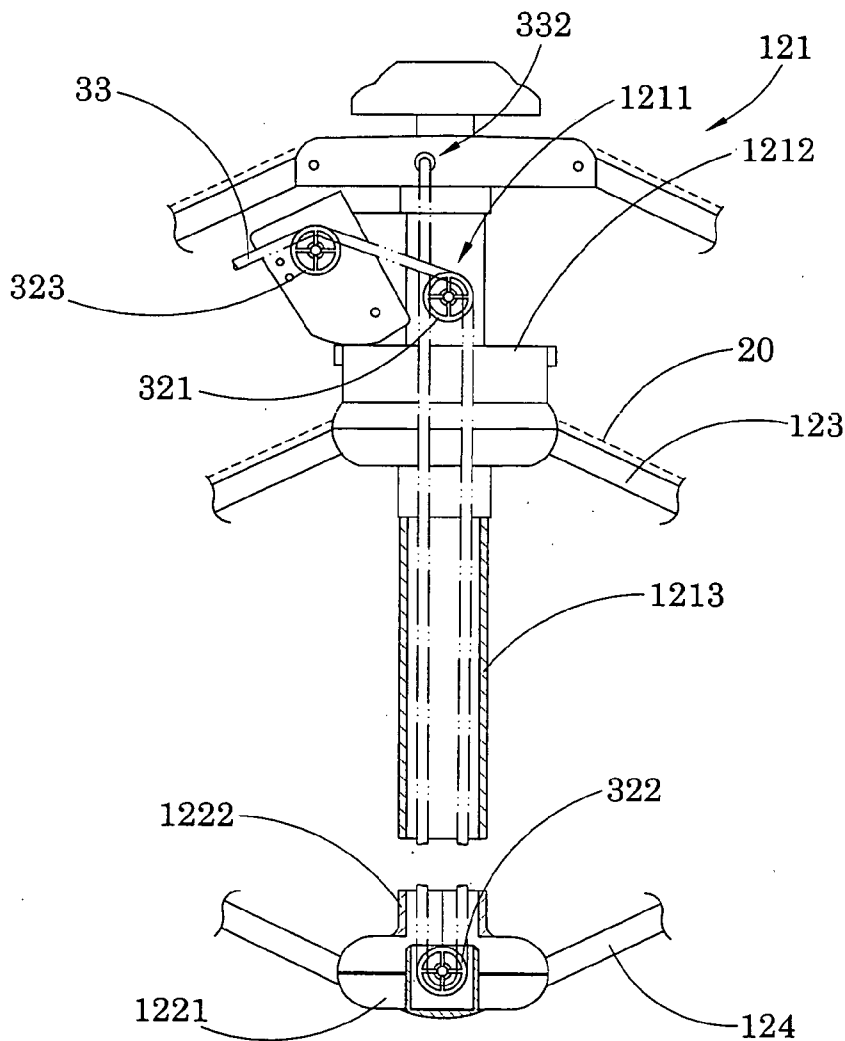
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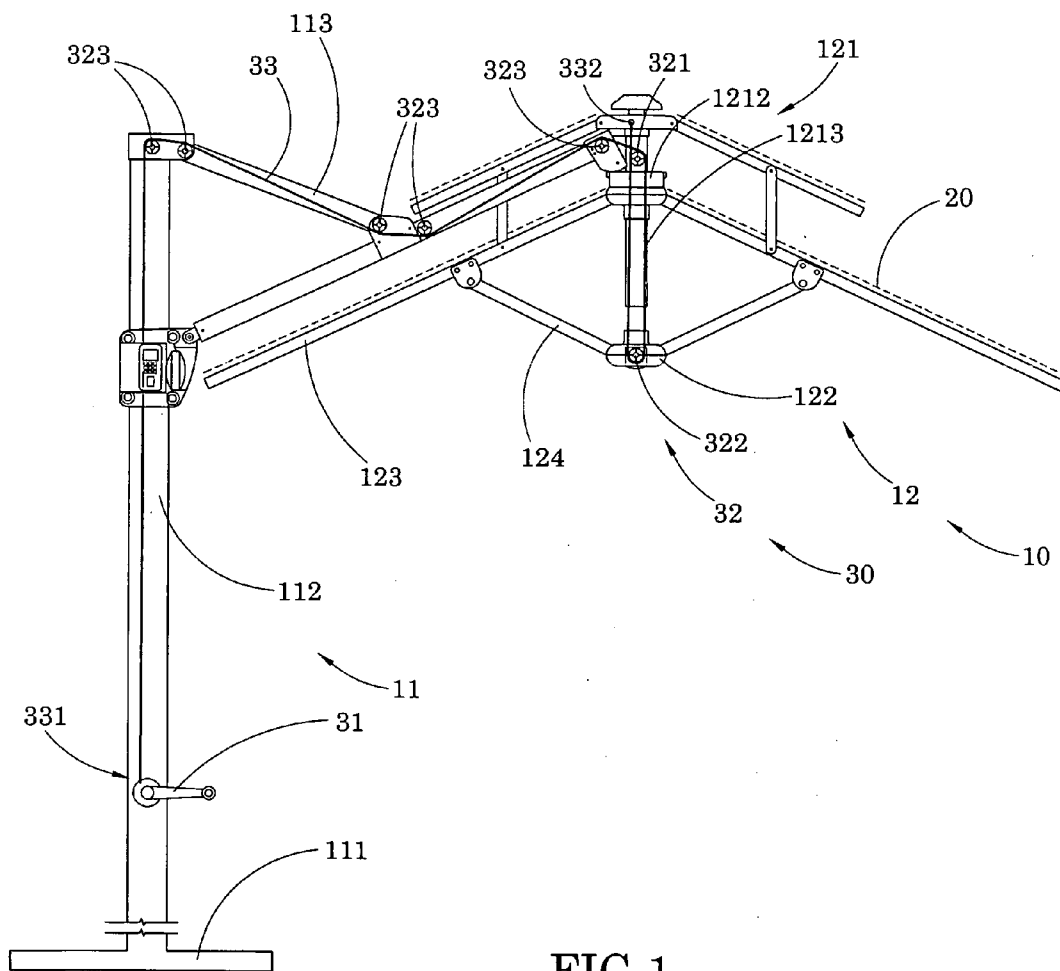


FIG.1

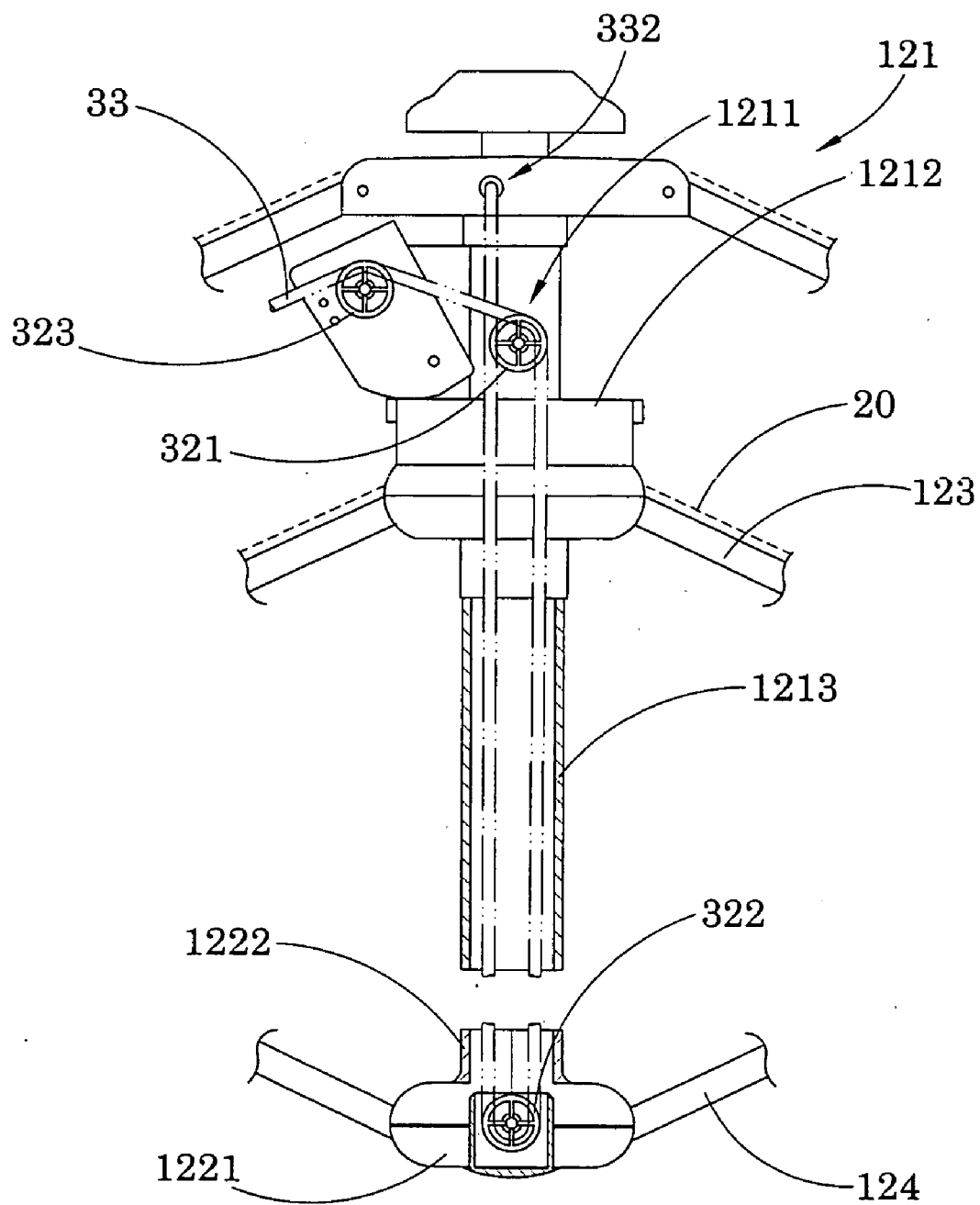


FIG. 2

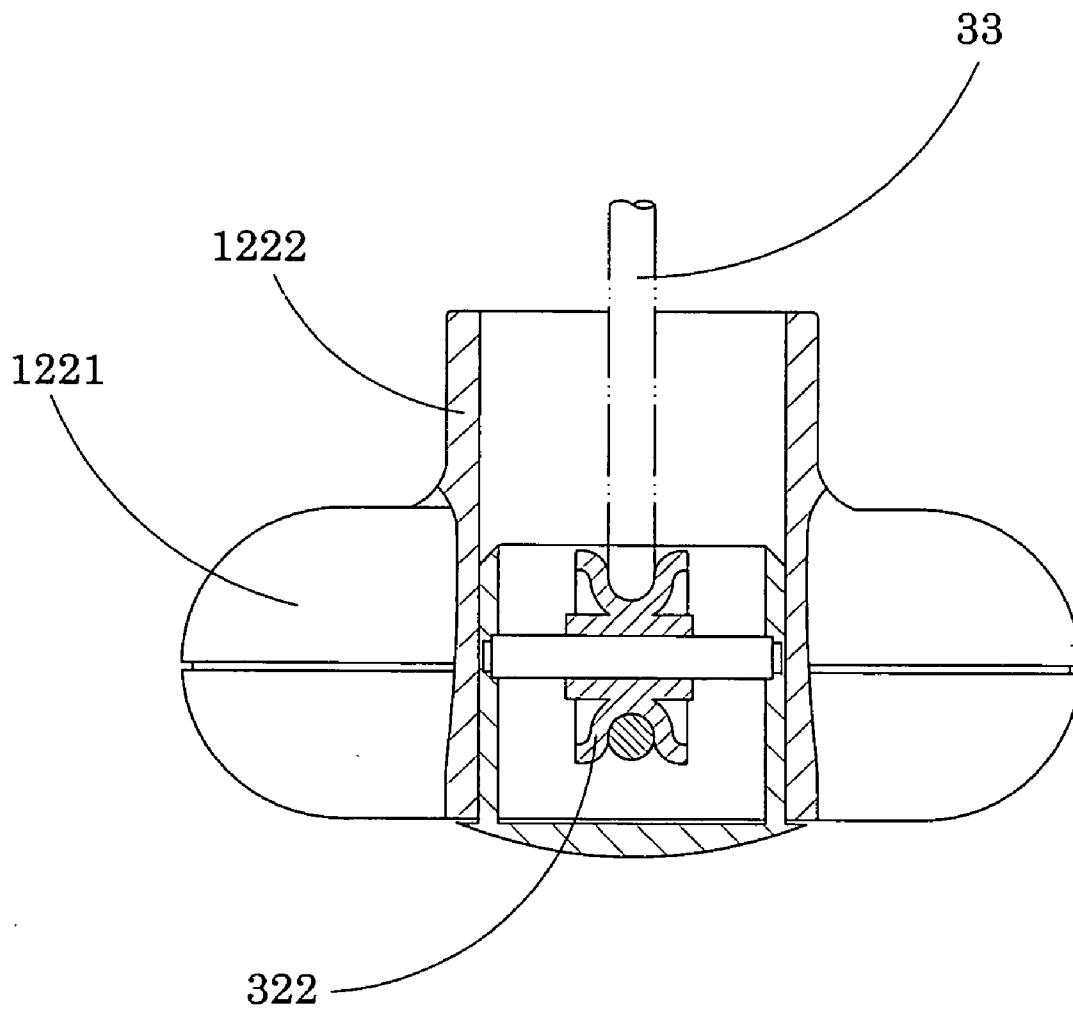


FIG.3



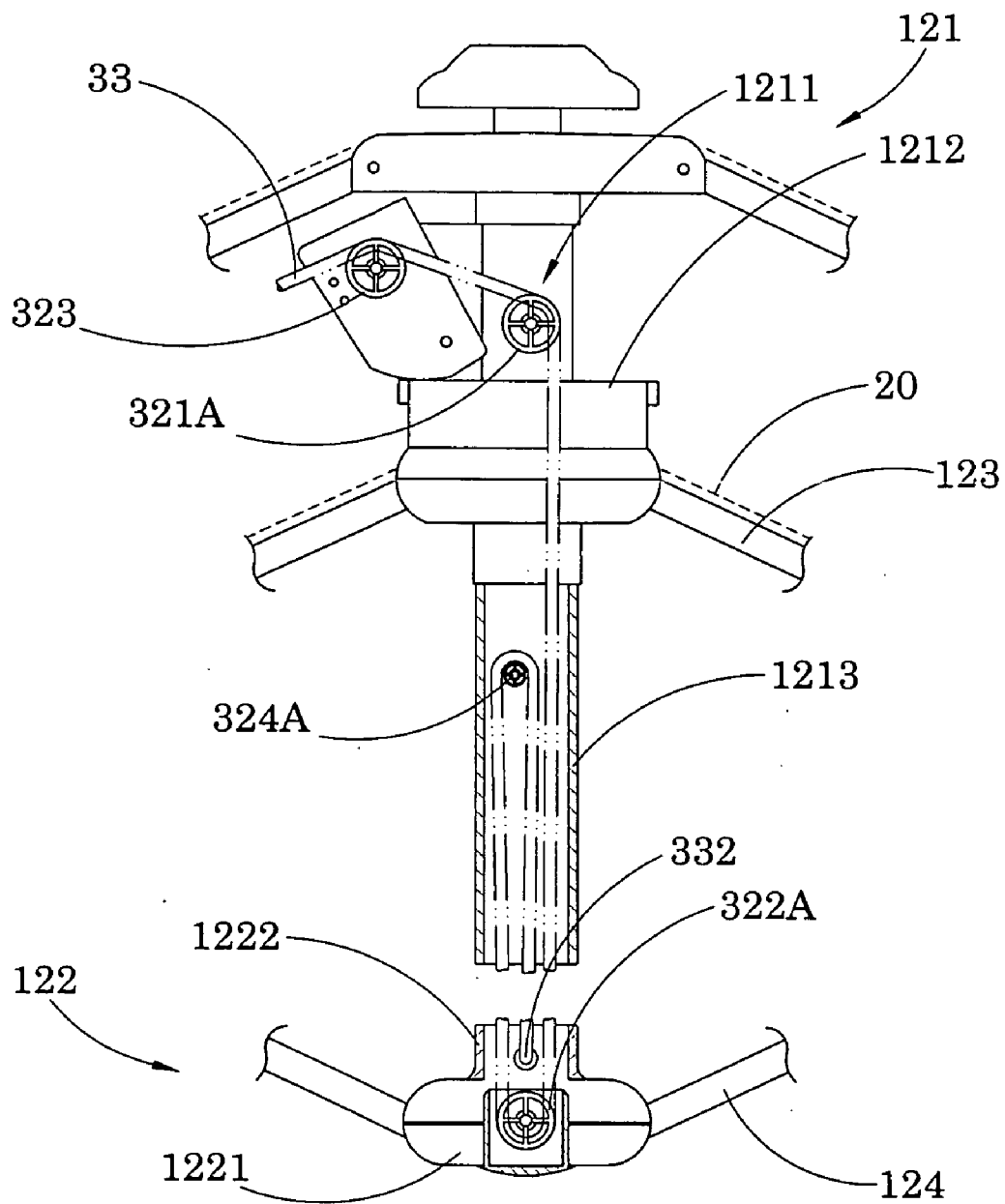


FIG.5

**OPERATION SYSTEM FOR OUTDOOR UMBRELLA**

**BACKGROUND OF THE PRESENT INVENTION**

**[0001]** 1. Field of Invention

**[0002]** The present invention relates to an outdoor umbrella, and more particularly to an outdoor umbrella with an operation system, which enhances the folding operation of the outdoor umbrella and simplifies the operation structure of the outdoor umbrella.

**[0003]** 2. Description of Related Arts

**[0004]** A conventional outdoor umbrella is usually composed of an umbrella frame which comprises supporting frame and an awning frame movably supported on the supporting frame, and an awning fabric supported on the awning frame for providing shade under the awning fabric. Conventionally, the outdoor umbrella is usually foldable so that when it is not in use, the outdoor umbrella can be folded into a compact size for convenient transport and storage.

**[0005]** People usually use the conventional outdoor umbrella for a wide variety of outdoor activities. For example, people may use the outdoor umbrella during camping for providing some sort of shielding from sunlight. The awning can be opened and closed through the operational controller. However, there is a conflict between opening and closing the awning easily and the stability of securely locking the umbrella. For instance, if people can open and close the outdoor umbrella easily, the stability of opening umbrella can not be guaranteed. On the other hand, if the outdoor umbrella has a very good securing mechanism, it usually needs more force to open the umbrella. As a result, they may use their own locking mechanism and this may create great trouble when opening the umbrella.

**[0006]** Accordingly, an operation system incorporating with a gear mechanism is commonly used in the outdoor umbrella. The operation system generally comprises a plurality of gears supported within the supporting frame and the awning frame respectively such that when a rotational force is applied at an initial gear, the consequent gears are driven to rotate to pivotally fold the awning frame between the opened position and the closed position. However, such operation system has several drawbacks.

**[0007]** The overall size of the outdoor umbrella is relatively large that the umbrella frame must provide relatively large installation space for the gears supporting therewithin. In other words, the tubular structure of the umbrella frame must large enough to receive the gears inside the interior of the umbrella frame. If a smaller size of the gear is used to fit inside the umbrella frame, the operation of the outdoor umbrella requires relatively large rotational force to drive the outdoor umbrella between the opened and closed position.

**[0008]** In addition, the gear must be provided at each of the cornering portions of the outdoor umbrella to transmit the rotational force from one direction to another direction. Accordingly, different types of gear, such as bevel gears, cogs, and helical gears, must be incorporated with each other to transmit the rotational force from the supporting frame to the awning frame. Therefore, the manufacturing process of the operation system is relatively complicated and the manufacturing cost of the operation system is relatively high.

**[0009]** The maintenance of the outdoor umbrella is costly and hassle. The user must frequently apply lubricant to the gears to reduce the friction thereamong. However, the gears are embedded in the umbrella frame such that the user must

disassemble the umbrella frame to apply the lubricant at the gears. Thus, when the gears involve high speeds or large power transmission, noise abatement is important.

**[0010]** As a matter of fact, except for easily opening and closing the umbrella, securely locking has become a virtually universal problem for manufacturers to develop the new generation outdoor umbrella. The conventional outdoor umbrella needs to consider how to securely and easily lock the awning arms.

**SUMMARY OF THE PRESENT INVENTION**

**[0011]** A main object of the present invention is to provide an outdoor umbrella with an operation system, which enhances the folding operation of the outdoor umbrella by means of pulley system.

**[0012]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operational force for folding the outdoor umbrella is directionally transmitted through the controlling element. In other words, the controlling element is extended along each of the cornering portions of the outdoor umbrella to transmit the operation force from one direction to another direction. Therefore, the operation system simplifies the operation structure of the outdoor umbrella.

**[0013]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operation pulleys are supported within the umbrella frame of the outdoor umbrella for guiding the directions of the controlling element such that the overall size of the outdoor umbrella can be significantly reduced by using the smaller size of the operation pulley without compensating the loss of the operation force.

**[0014]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the folding operation of the outdoor umbrella is smooth and stable. Noise abatement is one of the features that the operation system of the present invention can achieve.

**[0015]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operation system can be controlled by an operational controller for generating the operational force so as to maximize the ease of operation of the operation system on the outdoor umbrella.

**[0016]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operational controller can be a hand crank or a motor crank, such that the user is able to control the folding operation manually or automatically.

**[0017]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operation system requires relatively less operational force to fold the outdoor umbrella between the opened and closed positions via the pulley structure.

**[0018]** Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein the operation system is installed into the umbrella frame in a hidden manner to maintain the maximum life span and optimal aesthetic appearance of the outdoor umbrella.

**[0019]** Another object of the present invention is to provide an operation system for the outdoor umbrella, which does not require to alter the original structural design of the outdoor umbrella to install the operation pulleys therein, so as to minimize the manufacturing cost of the outdoor umbrella incorporating with the operation system.

[0020] Another object of the present invention is to provide an operation system for the outdoor umbrella, wherein no expensive or complicated structure is required to employ in the present invention in order to achieve the above mentioned objects. Therefore, the present invention successfully provides an economic and efficient solution for providing a rigid and stable configuration for folding operation of the outdoor umbrella.

[0021] Accordingly, in order to accomplish the above objects, the present invention provides an outdoor umbrella, comprising:

[0022] an umbrella frame which comprises a supporting frame and an awning frame, suspendedly supported by the supporting frame, wherein the awning frame is adapted to fold between an opened position and a closed position;

[0023] an awning element supported by the awning frame to define a shading area underneath the awning element when the awning frame is folded at the opened position; and

[0024] an operation system, comprising:

[0025] an operational controller supported at the supporting frame;

[0026] a pulley unit supported within the umbrella frame in a hidden manner; and

[0027] an elongated controlling element running from the operational controller to the awning frame through the pulley unit and defining an operation length between the operational controller and the awning frame, wherein when the operational controller is actuated to shorten the operation length of the controlling element, the awning frame is pivotally folded at the opened position, and when the operational controller is actuated to extend the operation length of the controlling element, the awning frame is pivotally folded at the closed position.

[0028] These and other objectives, features, and advantages of the present invention will become apparent from the following detailed description, the accompanying drawings, and the appended claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0029] FIG. 1 is a perspective view of an outdoor umbrella with an operation system according to a preferred embodiment of the present invention.

[0030] FIG. 2 is a sectional view of the operation system of the outdoor umbrella according to the above preferred embodiment of the present invention.

[0031] FIG. 3 is a sectional view of the lower housing of the outdoor umbrella according to the above preferred embodiment of the present invention.

[0032] FIG. 4 illustrates an alternative mode of the operation system for the outdoor umbrella according to the above preferred embodiment of the present invention.

[0033] FIG. 5 is a sectional view of the alternative operation system of the operation system according to the above preferred embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0034] Referring to FIG. 1 of the drawings, an outdoor umbrella according to a preferred embodiment of the present invention is illustrated, in which the umbrella frame comprises an umbrella frame 10, an awning element 20, and an operation system 30.

[0035] The umbrella frame 10 comprises a supporting frame 11 and an awning frame 12, suspendedly supported by the supporting frame 11, wherein the awning frame 12 is adapted to fold between an opened position and a closed position. The awning element 20, which is made of waterproof and UV blocking fabric, is supported by the awning frame 12 to define a shading area underneath the awning element 20 when the awning frame 11 is folded at the opened position.

[0036] The operation system 30 comprises an operational controller 31 supported at the supporting frame 11 and a pulley unit 32 supported within the umbrella frame 10 in a hidden manner. The operation system 30 further comprises an elongated controlling element 33 running from the operational controller 31 to the awning frame 12 through the pulley unit 32 and defining an operation length between the operational controller 31 and the awning frame 12, wherein when the operational controller 31 is actuated to shorten the operation length of the controlling element 33, the awning frame 12 is pivotally folded at the opened position, and when the operational controller 31 is actuated to extend the operation length of the controlling element 33, the awning frame 12 is pivotally folded at the closed position.

[0037] According to the preferred embodiment, the supporting frame 11 comprises a ground stand 111 and a supporting shaft 112 is upwardly extended from the ground stand 111 to support the awning frame 12.

[0038] The awning frame 12 comprises an upper housing 121 coupling with the supporting shaft 112, a lower housing 122 positioned below the upper housing 121, a plurality of awning arms 123 radially and pivotally extended from the upper housing 121 to support the awning element 20, and a plurality of folding arms 124 radially and pivotally extended from the lower housing 122 to pivotally couple with the awning arms 123. As shown in FIG. 1, the supporting frame 11 further comprises an extension frame 113 extended from the supporting shaft 112 to the upper housing 121.

[0039] Accordingly, when the lower housing 122 is upwardly lifted towards the upper housing 121, the awning arms 123 are outwardly and pivotally folded to extend the awning arms 123 from the upper housing 121 so as to fold the awning frame 12 at the opened position. When the lower housing 122 is downwardly dropped from the upper housing 121, the awning arms 123 are downwardly and pivotally folded to minimize the shading area so as to fold the awning frame 12 at the closed position.

[0040] The pulley unit 32 comprises a first operation pulley 321 rotatably supported in an upper portion of the awning frame 12 and a second operation pulley 322 rotatably supported in a lower portion of the awning frame 12 to align with the first operation pulley 321, wherein the controlling element 33 runs between the first and second operation pulleys 321, 322.

[0041] As shown in FIG. 2, the first operation pulley 321 is rotatably supported in the upper housing 121 while a second operation pulley 322 is rotatably supported in the lower housing 122, wherein the controlling element 33 runs between the first and second operation pulleys 321, 322 to drive the lower housing 122 in a vertically movable displacement. Accordingly, each of the first and second operation pulleys 321, 322 is a rotational wheel with a groove between two flanges around its circumference such that the controlling element 33 is extended to slidably engage with the grooves of the first and second operation pulleys 321, 322, as shown in FIG. 3. A



diameter of the first pulley 321 equals to a diameter of the second pulley 322 such that the first and second operation pulleys 321, 322 are aligned with each other.

[0042] As shown in FIG. 2, the upper housing 121 has an upper housing compartment 1211 and comprises an enlarged upper body 1212 for the awning arms 123 pivotally and radially extending therefrom and a tubular lower body 1213 downwardly extended from the upper body 1212, wherein the first operation pulley 321 is rotatably supported in the upper housing compartment 1211.

[0043] The lower housing 122 has a lower housing compartment 1221 for the second operation pulley 322 rotatably supporting therewithin, and a retention socket 1222 upwardly extended to align with the lower body 1213 of the upper housing 121. When the outdoor umbrella 10 is folded at the closed position, the lower housing 122 is suspendedly supported below the upper housing 121. When the lower housing 122 is upwardly lifted to fold the awning frame 12 at the opened position, the bottom portion of the lower body 1213 is biased against the retention socket 1222. Therefore, when the lower housing 122 is engaged with the upper housing 121, the lower housing 122 is blocked for preventing a further upward movement so as to retain the awning frame 12 at the opened position.

[0044] The controlling element 33, which is embodied as a durable cable, has a first end 331 affixed to the operational controller 31 and a second end 332 extended through the umbrella frame 10 to affix at the awning frame 12. According to the preferred embodiment, the controlling element 33 runs within the interiors of the supporting shaft 112, the extension frame 113, the upper housing 121, and the lower housing 122, such that the controlling element 33 is extended through the umbrella frame 10 in a hidden manner. In other words, the pulley unit 32 and the controlling element 33 are embedded within the umbrella frame 10 to maintain the maximum life span and optimal aesthetic appearance of the outdoor umbrella.

[0045] As shown in FIG. 2, the second end 332 of the controlling element 33 is affixed to the upper housing 121 of the awning frame 12, wherein a second end portion of the controlling element 33 is downwardly extended from the first operation pulley 321 at the upper housing 121 to the second operation pulley 322 at the lower housing 122 and is then made a detour to return back to the upper housing 121 to affix the second end 332 of the controlling element 33 to the upper housing 121. The second end portion of the controlling element 33 is extended through the upper housing compartment 1211 of the upper housing 121 from the upper body 1212 to the lower body 1213 and is then extended through the lower housing compartment 1221 from the retention socket 1222.

[0046] Accordingly, the second end portion of the controlling element 33 is wound between the first and second operation pulleys 321, 322 to define two parallel tension sections as shown in FIG. 2. Having the structural configuration, the first and second operation pulleys 321, 322 can change the direction of the force along the controlling element 33 to move the lower housing 122 at the vertically movable manner.

[0047] Therefore, when the controlling element 33 is pulled, the lower housing 122 is lifted upwardly by the second end portion of the controlling element 33 via the first and second operation pulleys 321, 322 to fold the awning frame 12 at the opened position. Likewise, when the pulling force of the controlling element 33 is released, the weight of the lower housing 122 is dropped downwardly to fold the awning 12 at

the closed position. The pulley unit 32 can simplify the structural configuration of the outdoor umbrella and enhance the folding operation of the outdoor umbrella so as to provide a stable folding operation of the awning frame 12.

[0048] According to the preferred embodiment, the operational controller 31, which is a manual hand operation device, comprises a rotator wheel rotatably supported at the supporting shaft 112 at a hand-reachable location and a hand crank device coupling with the rotator wheel, wherein the first end 331 of the controlling element 33 is affixed to the rotator wheel in such a manner that when the hand crank device is manually actuated to drive the rotator wheel to rotate at one rotational direction, a first end portion of the controlling element 33 is wound up at the rotator wheel to shorten the controlling length of the controlling element 33 so as to apply the pulling force therealong for folding the awning frame 12 at the opened position. Having the structural configuration between the first and second operation pulleys 321, 322, the awning frame 23 can be smoothly folded at the opened position while being force effective. According to the theory of the conservation of energy, the product of the weight lifted times the distance it is moved is equal to the product of the lifting force. Having the controlling length of the controlling element 33, the operation system 30 requires less force, and therefore less effort is required for folding operation.

[0049] When the hand crank device is manually actuated to drive the rotator wheel to rotate at an opposed rotational direction, the first end portion of the controlling element 33 is unwound at the rotator wheel to extend the controlling length of the controlling element 33 so as to fold the awning frame 12 at the closed position. It is worth to mention that the hand crank device is releasably locked at the rotator wheel such that when the first end portion of the controlling element 33 is wound at the rotator wheel, the rotator wheel is locked by the hand crank device to prevent the first end portion of the controlling element 33 being unwound accidentally. In other words, the user must intentionally actuate the hand crank device to wind up or unwind the first end portion of the controlling element 33 at the rotator wheel.

[0050] As shown in FIG. 1, the pulley unit 32 further comprises a plurality of guiding pulleys 323 spacedly supported in the umbrella frame 10 to guide the controlling element 33 being directionally extended from the supporting frame 11 to the awning frame 12. Accordingly, since the umbrella frame 10 incorporates with a plurality of pivot hinges to enable the awning frame 12 to pivotally fold at different orientations and between the opened and closed position, the controlling element 33 must be guided to detour from the supporting frame 11 to the awning frame 12 at different directions. As shown in FIG. 1, one of the guiding pulleys 323 is rotatably supported at the upper portion of the supporting shaft 112 to detour the controlling element 33 from the supporting shaft 112 to the extension frame 113. Another guiding pulley 323 is rotatably supported at the upper housing 121 to detour the controlling element 33 from the extension frame 113 to the upper housing 121. Two of the guiding pulleys 323 are spacedly and rotatably supported within the extension frame 113 to detour the controlling element 33 extending along the extension frame 113. Therefore, having the guiding pulleys 323 at the desired locations of the umbrella frame 10, the controlling element 33 can be simply made a detour to extend from the operational controller 31 to the awning frame 12.

[0051] It is worth to mention that the first and second operation pulleys 321, 322, and the guiding pulleys 323 are all stationary pulleys.

[0052] The upper housing 121 has an upper housing compartment 1211 and comprises an enlarged upper body 1212 which is supporting the first operation pulley 231A thereat and is pivotally coupling the awning arms 123, and a tubular lower body 1213 downwardly extended from the upper body 1212 to support the third operation pulley 234A at the lower body 1213. The lower housing 122 has a lower housing compartment 1221 supporting the second operation pulley 232A thereat and a retention socket 1222 upwardly extended to align with the lower body 1213 of the upper housing 121, such that when the lower housing 122 is upwardly lifted to fold the awning frame 12 at the opened position, a bottom portion of the lower body 1213 is biased against the retention socket 1222.

[0053] FIGS. 4 and 5 illustrate an alternative mode of the operation system 30A, wherein the pulley unit 32A comprises a first operation pulley 321A rotatably supported in an upper portion of the awning frame 12, a second operation pulley 322 rotatably supported in a lower portion of the awning frame 12, and a third operation pulley 324A rotatably supported in the upper portion of the awning frame 12 at a position below the first operation pulley 321A. The controlling element 33 runs among the first, second, and third operation pulleys 321A, 322A, 324A.

[0054] The first and third operation pulleys 321A, 324A are rotatably and spacedly supported in the upper housing 121 while the second operation pulley 322A is rotatably supported in the lower housing 122. In other words, the third operation pulley 324A is positioned between the first and second operation pulleys 321A, 322A, as shown in FIG. 5. The first, second, and third operation pulleys 321A, 322A, 324A are stationary pulleys.

[0055] Accordingly, the second end 332 of the controlling element 33 is affixed to the lower housing 122 of the awning frame 12, wherein the controlling element 33 from the first operation pulley 321A to the third operation pulley 324A through the second operation pulley 322A to drive the lower housing 122 in a vertically movable displacement. As shown in FIG. 5, the second end portion of the controlling element 33 is downwardly extended from the first operation pulley 321A at the upper housing 121 to the second operation pulley 322A at the lower housing 122 and is then made a detour to return back to the upper housing 121. Then, the second end portion of the controlling element 22 is upwardly extended to the third operation pulley 324A and is then made a detour to return back to the lower housing 122 to affix the second end 332 of the controlling element 33 to the lower housing 122. Preferably, a diameter of each of the first and second pulleys 321A, 322A is larger than a diameter of the third pulley 324A, wherein the first and second operation pulleys 321A, 322A are aligned with each other along the vertical axis between the upper and lower housings 121, 122. Alternatively, the third operation pulley 324 is positioned slightly offset from the alignment between the first and second operation pulleys 321A, 322A. As shown in FIG. 5, the first and second operation pulleys 321A, 322A are aligned with each other while the third operation pulley 324A is slightly offset between the first and second operation pulleys 321A, 322A. It is worth to mention that the third operation pulley 324A is used as a force directional guider to change the direction of the pulling force along the controlling element 33. Thus, having the third

operation pulley 324A, the awning frame 23 can be smoothly folded at the opened position while being force effective.

[0056] FIG. 4 also illustrates an alternative mode of the operational controller 31A, wherein the operational controller 31A is embodied as an automatic switch electrically connected with a power source to automatically control the folding operation of the awning frame 12. Accordingly, the operational controller 31A comprises a rotator wheel powered by an electric motor to drive the rotator wheel to rotate, wherein the first end 331 of the controlling element 33 is affixed to the rotator wheel of the operational controller 31A. As it is mentioned above, the rotator wheel is manually driven by the hand crank device to control the folding operation of the awning frame 12. Having the same structural configuration, the rotator wheel is automatically driven by the electric motor to control the folding operation of the awning frame 12. Therefore, the user is able to control the folding operation by pressing a button of the automatic switch.

[0057] One skilled in the art will understand that the embodiment of the present invention as shown in the drawings and described above is exemplary only and not intended to be limiting.

[0058] It will thus be seen that the objects of the present invention have been fully and effectively accomplished. It embodiments have been shown and described for the purposes of illustrating the functional and structural principles of the present invention and is subject to change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

What is claimed is:

1. An outdoor umbrella, comprising:

an umbrella frame which comprises a supporting frame and an awning frame, suspendedly supported by said supporting frame, wherein said awning frame is adapted to fold between an opened position and a closed position;

an awning element supported by said awning frame to define a shading area underneath said awning element when said awning frame is folded at said opened position; and

an operation system, comprising:

an operational controller supported at said supporting frame;

a pulley unit supported within said umbrella frame in a hidden manner; and

an elongated controlling element running from said operational controller to said awning frame through said pulley unit and defining an operation length between said operational controller and said awning frame, wherein when said operational controller is actuated to shorten said operation length of said controlling element, said awning frame is pivotally folded at said opened position, and when said operational controller is actuated to extend said operation length of said controlling element, said awning frame is pivotally folded at said closed position.

2. The outdoor umbrella, as recited in claim 1, wherein said controlling element, which is embodied as a durable cable, has a first end affixed to said operational controller and a second end extended through an interior of said umbrella frame to affix at said awning frame.

3. The outdoor umbrella, as recited in claim 1, wherein said awning frame comprises an upper housing coupling with said

supporting frame, a lower housing positioned below said upper housing, and a plurality of awning arms radially and pivotally extended from said upper housing to support said awning element, wherein said controlling element runs between said upper and lower housings to control a vertical movement of said lower housing that when said lower housing is upwardly lifted towards said upper housing, said awning arms are outwardly and pivotally folded to fold said awning frame at said opened position, and when said lower housing is downwardly dropped from said upper housing, said awning arms are downwardly and pivotally folded to fold said awning frame at said closed position.

4. The outdoor umbrella, as recited in claim 2, wherein said awning frame comprises an upper housing coupling with said supporting frame, a lower housing positioned below said upper housing, and a plurality of awning arms radially and pivotally extended from said upper housing to support said awning element, wherein said controlling element runs between said upper and lower housings to control a vertical movement of said lower housing that when said lower housing is upwardly lifted towards said upper housing, said awning arms are outwardly and pivotally folded to fold said awning frame at said opened position, and when said lower housing is downwardly dropped from said upper housing, said awning arms are downwardly and pivotally folded to fold said awning frame at said closed position.

5. The outdoor umbrella, as recited in claim 1, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame and a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, wherein said controlling element is guided to run between said first and second operation pulleys.

6. The outdoor umbrella, as recited in claim 2, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame and a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, wherein said controlling element is guided to run between said first and second operation pulleys.

7. The outdoor umbrella, as recited in claim 4, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame and a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, wherein said controlling element is guided to run between said first and second operation pulleys.

8. The outdoor umbrella, as recited in claim 7, wherein said first and second operation pulleys are rotatably supported upper and lower housings respectively, wherein said second end of said controlling element is affixed to said upper housing, wherein a second end portion of said controlling element is downwardly extended from said first operation pulley at said upper housing to said second operation pulley at said lower housing and is then made a detour to return back to said upper housing to affix said second end of said controlling element to said upper housing.

9. The outdoor umbrella, as recited in claim 7, wherein said pulley unit further comprises a plurality of guiding pulleys spacedly supported in said umbrella frame to guide said controlling element being directionally extended from said supporting frame to said awning frame.

10. The outdoor umbrella, as recited in claim 8, wherein said pulley unit further comprises a plurality of guiding pul-

leys spacedly supported in said umbrella frame to guide said controlling element being directionally extended from said supporting frame to said awning frame.

11. The outdoor umbrella, as recited in claim 9, wherein said first and second operation pulleys and said guiding pulleys are stationary pulleys.

12. The outdoor umbrella, as recited in claim 10, wherein said first and second operation pulleys and said guiding pulleys are stationary pulleys.

13. The outdoor umbrella, as recited in claim 8, wherein said upper housing has an upper housing compartment supporting said first operation pulley thereat and comprises an enlarged upper body for said awning arms pivotally and radially extending therefrom and a tubular lower body downwardly extended from said upper body, wherein said lower housing has a lower housing compartment supporting said second operation pulley thereat and a retention socket upwardly extended to align with said lower body of said upper housing, such that when said lower housing is upwardly lifted to fold said awning frame at said opened position, a bottom portion of said lower body is biased against said retention socket.

14. The outdoor umbrella, as recited in claim 12, wherein said upper housing has an upper housing compartment supporting said first operation pulley thereat and comprises an enlarged upper body for said awning arms pivotally and radially extending therefrom and a tubular lower body downwardly extended from said upper body, wherein said lower housing has a lower housing compartment supporting said second operation pulley thereat and a retention socket upwardly extended to align with said lower body of said upper housing, such that when said lower housing is upwardly lifted to fold said awning frame at said opened position, a bottom portion of said lower body is biased against said retention socket.

15. The outdoor umbrella, as recited in claim 1, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame, a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, and a third operation pulley rotatably supported in said upper portion of said awning frame at a position below said first operation pulley, wherein said controlling element is guided to run among said first, second, and third operation pulleys.

16. The outdoor umbrella, as recited in claim 2, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame, a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, and a third operation pulley rotatably supported in said upper portion of said awning frame at a position below said first operation pulley, wherein said controlling element is guided to run among said first, second, and third operation pulleys.

17. The outdoor umbrella, as recited in claim 4, wherein said pulley unit comprises a first operation pulley rotatably supported in an upper portion of said awning frame, a second operation pulley rotatably supported in a lower portion of said awning frame to align with said first operation pulley, and a third operation pulley rotatably supported in said upper portion of said awning frame at a position below said first operation pulley, wherein said controlling element is guided to run among said first, second, and third operation pulleys.

18. The outdoor umbrella, as recited in claim 17, wherein said first and third operation pulleys are rotatably and

spacedly supported in said upper housing, wherein said second operation pulley is rotatably supported in said lower housing, wherein said second end of said controlling element is affixed to said lower housing, wherein a second end portion of said controlling element is downwardly extended from said first operation pulley at said upper housing to said second operation pulley at said lower housing and is then made a detour to return back to said upper housing, wherein said second end portion of said controlling element is then upwardly extended to said third operation pulley at said upper housing and is made a detour to return back to said lower housing to affix said second end of said controlling element to said lower housing.

**19.** The outdoor umbrella, as recited in claim **17**, wherein said pulley unit further comprises a plurality of guiding pulleys spacedly supported in said umbrella frame to guide said controlling element being directionally extended from said supporting frame to said awning frame.

**20.** The outdoor umbrella, as recited in claim **18**, wherein said pulley unit further comprises a plurality of guiding pulleys spacedly supported in said umbrella frame to guide said controlling element being directionally extended from said supporting frame to said awning frame.

**21.** The outdoor umbrella, as recited in claim **17**, wherein said first, second, and third operation pulleys, and said guiding pulleys are stationary pulleys.

**22.** The outdoor umbrella, as recited in claim **20**, wherein said first, second, and third operation pulleys, and said guiding pulleys are stationary pulleys.

**23.** The outdoor umbrella, as recited in claim **17**, wherein a diameter of each of said first and second pulleys is larger than a diameter of said third pulley, wherein said first and second operation pulleys are aligned with each other.

**24.** The outdoor umbrella, as recited in claim **22**, wherein a diameter of each of said first and second pulleys is larger than a diameter of said third pulley, wherein said first and second operation pulleys are aligned with each other.

**25.** The outdoor umbrella, as recited in claim **17**, wherein said upper housing comprises an enlarged upper body which is supporting said first operation pulley thereat and is pivotally coupling said awning arms, and a tubular lower body downwardly extended from said upper body to support said third operation pulley at said lower body, wherein said lower housing has a lower housing compartment supporting said second operation pulley thereat and a retention socket upwardly extended to align with said lower body of said upper housing, such that when said lower housing is upwardly lifted to fold said awning frame at said opened position, a bottom portion of said lower body is biased against said retention socket.

**26.** The outdoor umbrella, as recited in claim **24**, wherein said upper housing comprises an enlarged upper body which is supporting said first operation pulley thereat and is pivotally coupling said awning arms, and a tubular lower body downwardly extended from said upper body to support said third operation pulley at said lower body, wherein said lower housing has a lower housing compartment supporting said second operation pulley thereat and a retention socket upwardly extended to align with said lower body of said upper housing, such that when said lower housing is upwardly lifted to fold said awning frame at said opened position, a bottom portion of said lower body is biased against said retention socket.

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