

Description

Title of Invention: Umbrella

Technical Field

5 [0001]

[Cross Reference to Related Application]

The present application claims the priority from Japanese Patent Application No. 2016-215590 (filed on Nov. 2, 2016). the content of which is hereby incorporated in its entire by reference in this
10 description.

The present invention relates to an umbrella, and more particularly, to an umbrella which frees both hands of the umbrella user.

BACKGROUND

15 [0002]

Conventionally a lot of umbrellas and supporting tools of umbrella made to be attachable to a body or bicycle and the like using a mounting appliance are proposed. In order to dissolve inconvenience that hands are occupied and busy when working
20 with both hands while holding up the umbrella or getting on a bicycle or pushing a stroller.

Among them, the following patent literatures are known with reference to the umbrella which allows a user to be at the center of the umbrella while using umbrella.

25 [0003]

For example, umbrellas having a middle rod that can be opened right- and leftward in a bifurcated form, and allowed it to be mounted to a body are disclosed in Japanese Patent Kokai Publication No. 2010-5355 and Japanese Patent Kokai
30 Publication No. 2000-139533.

[0004]

Furthermore, an umbrella of the physical mounting type proposed by this applicant is disclosed in Japanese Patent Kokai

Publication No. 2007-54105 and WO 2012/023460.

CITATION LIST

PATENT LITERATURE

[0005]

- 5 [PATENT LITERATURE 1] Japanese Patent Kokai Publication
No. JP2010-5355 A
[PATENT LITERATURE 2] Japanese Patent Kokai Publication
No. JP 2000-139533 A
[PATENT LITERATURE 3] Japanese Patent Kokai Publication
10 No. JP 2007-54105 A
[PATENT LITERATURE 4] WO 2012/023460 A

SUMMARY

TECHNICAL PROBLEM

[0006]

- 15 In the case of umbrellas according to either of PATENT
LITERATURE 1, 2, it assumes a configuration that right and left
rods, (middle rods) independently support the superstructure
(part above the lower cylindrical member (lower ring), also
called as "upper frame") of the umbrella.
20 Therefore, there are problems that it is necessary to make the
right and left rods thick and to use a firm hinge for the movable
part, which result in increase in weight of umbrella itself, and
the center of the gravity of the umbrella becomes higher.

[0007]

- 25 As for the umbrella of PATENT LITERATURE 3, support
stretchers of four in total are arranged and the necessary
stiffness is secured by connecting each support stretcher with
lower ring and a link, however, the structure is complicated.
As for the umbrellas of PATENT LITERATURE 4, the bottom end
30 of umbrella is at the position of user's chest, thus there is a
problem that umbrella swings back and forth if user fastens the
belt not so tight.

[0008]

This invention has been made taking the described above

circumstances into consideration, and a purpose is to provide an umbrella which is attachable to the body etc. of user, and can improve the stability of the umbrella and portability during use by a simple configuration.

5 Solution to Problem

[0009]

According to a first aspect of present invention, an umbrella is provided which comprises a supporting structure configured by including two support stretchers with one ends being connected
10 to an umbrella body and the other ends being connected each other, at least one stage of an expansion and contraction mechanism of the support stretchers, and lock mechanisms adapted to lock an expansion state of the support stretchers when opening the umbrella.

15 Advantageous Effects of Invention

[0010]

According to the present invention, the umbrella of a hands-free type having good stability and convenience in use is provided. The reason resides in that it is configured such that, by adopting
20 a truss structure in which the bottom ends of the two support stretchers are connected each other, the support stretchers are made stretchable and contractible to be allowed to stretch at the time of use (open time) of umbrella, and it can be mounted to a body in the form hard to swing back and forth, and the support
25 stretchers contract upon closing the umbrella, whereby it can improve portability property.

Brief Description of Drawings

[0011]

[Fig. 1] FIG. 1 is a front view of an umbrella of a first
30 exemplary embodiment (open state).

[Fig. 2] FIG. 2 is a front view of an umbrella of the first exemplary embodiment (open state).

[Fig. 3] FIG. 3 is a diagram showing a configuration example of an intersection part of a support stretcher of FIG 2

and a rib.

[Fig. 4] FIG. 4 is a diagram showing a closed state of the umbrella of the first exemplary embodiment.

[Fig. 5] FIG. 5 is a cross section diagram showing a lock mechanism (locked state) of the umbrella of the first exemplary embodiment.

[Fig. 6] FIG. 6 is a cross section diagram showing a lock mechanism (unlocked state) of the umbrella of the first exemplary embodiment.

[Fig. 7] FIG. 7 is a front view of an umbrella of a second exemplary embodiment (closed state).

[Fig. 8] FIG. 8 is a diagram showing an unlocked state of an expansion and contraction mechanism of the umbrella of the second exemplary embodiment.

[Fig. 9] FIG. 9 is a cross section diagram showing a lock mechanism of the umbrella of the second exemplary embodiment (locked state).

[Fig. 10] FIG. 10 is a cross section diagram showing the lock mechanism of the umbrella of the second exemplary embodiment (unlocked state).

[Fig. 11] FIG. 11 is a front view of an umbrella of a third exemplary embodiment (open state).

[Fig. 12] FIG. 12 is a diagram showing a closed state of the umbrella of the third exemplary embodiment.

[Fig. 13] FIG. 13 is a cross section diagram showing the lock mechanism of the umbrella of the third exemplary embodiment (locked state).

[Fig. 14] FIG. 14 is a cross section diagram showing the lock mechanism of the umbrella of the third exemplary embodiment (unlocked state).

[Fig. 15] FIG. 15 is a front view of an umbrella of a fourth exemplary embodiment (open state).

[Fig. 16] FIG. 16 is a cross section diagram of a lock mechanism of an umbrella of the fourth exemplary embodiment

(locked state).

[Fig. 17] FIG. 17 is a diagram showing a closed state of the umbrella of the fourth exemplary embodiment.

[Fig. 18] FIG. 18 is a cross section diagram showing the lock mechanism of the umbrella of the fourth exemplary embodiment (unlocked state).

[Fig. 19] FIG. 19 is a figure showing a contracted state of the umbrella of the fourth exemplary embodiment.

[Fig. 20] FIG. 20 is a diagram showing a belt delivering mechanism of the umbrella of the fourth exemplary embodiment.

[Fig. 21] FIG. 21 is a figure showing usage of the umbrella of the fourth exemplary embodiment.

[Fig. 22] FIG. 22 is a figure showing another usage of the umbrella of the fourth exemplary embodiment.

[Fig. 23] FIG. 23 is a figure showing another usage of the umbrella of the fourth exemplary embodiment.

[Fig. 24] FIG. 24 is a front view figure showing an umbrella of a fifth exemplary embodiment (open state).

[Fig. 25] FIG. 25 is a figure showing a closed state of the umbrella of the fifth exemplary embodiment.

[Fig. 26] FIG. 26 is a front view showing an umbrella of a sixth exemplary embodiment (open state).

[Fig. 27] FIG. 27 is a cross section diagram showing a lock mechanism of the umbrella of the sixth exemplary embodiment (locked state).

[Fig. 28] FIG. 28 is a diagram to illustrate an unlock operation of the lock mechanism of the umbrella of the sixth exemplary embodiment.

[Fig. 29] FIG. 29 is a cross section diagram of the lock mechanism of the umbrella of the sixth exemplary embodiment (unlocked state).

[Fig. 30] FIG. 30 is a figure showing a modified embodiment of the umbrella of the sixth exemplary embodiment.

Description of Embodiments

[0012]

First an overview of present invention is explained.

The present invention provides an umbrella which includes: a
5 supporting structure (two support stretchers with one ends being
connected each other and the other ends being connected to an
umbrella body 10), at least one stage of expansion and
contraction mechanism of the support stretchers, lock
mechanism(s) 21A that enables locking with keeping the
10 expansion and contraction mechanism in an extended state.

[0013]

While, according to the umbrella of the present invention,
adopting the truss structure in which the bottom ends of two
support stretchers are connected to each other, the support
15 stretchers are made to be stretchable, and they are extended at
the time of use (time to open umbrella), and it is mountable to a
body in the form hard to swing back and forth.

As a result, the umbrella of the hands-free type having good
stability and convenience is provided.

20 [0014]

Furthermore, portability is not imparted because the umbrella
can be shrunk because an extension and contraction mechanism is
provided according to the umbrella of the present invention by
canceling lock mechanism 21A in a closed state of an umbrella or
25 in cooperation with an operation to close the umbrella.

[0015]

[First Exemplary Embodiment]

Successively, the First Exemplary Embodiment of the present
invention is explained in detail with reference to the drawings.
30 FIG. 2 is a front view of an umbrella of the First Exemplary
Embodiment (open state) in which a canopy etc. are omitted.

Referring now to FIG. 2, a configuration of the umbrella
comprising an umbrella body 10, support stretchers 20 and
unlock levers 22 are shown.

[0016]

For example, as to the umbrella body 10, an umbrella equivalent to an umbrella of a type described in PATENT LITERATURE 1, 4 from which a middle rod omitted or contracted.

5 [0017]

The support stretcher 20 is configured by two stretchers (an inner member and an outer member adapted to receive the inner member) extendable and contractable in a telescopic manner, and the upper side of each of stretchers is connected to two ribs
10 suitable to support an umbrella (e.g., two ribs in the symmetrical positions with respect to an anteroposterior virtual line of the umbrella) among ribs of the umbrella body 10.

Also, bottom ends of stretchers configuring support stretchers 20 are connected each other.

15 Therefore, support stretchers 20 assume an approximately V-shaped form, as viewed from a front side.

[0018]

The support stretcher 20 is unlockable by pushing a pin 21 (protruding part), and in a predetermined stretched state, in
20 which pin 21 fits into a hole on an external cylinder forming the support stretcher, and a state in which an inner member is exposed from outer member can be maintained (locked state).

[0019]

One end of an unlock lever 22 is connected with a rib among ribs
25 of the umbrella body 10 to which the support stretcher is connected.

An annulus part (slider) slidable longitudinally is formed at a bottom end of the unlock lever 22 in a state enclosing around a periphery of the support stretcher 20.

30 Therefore, the unlock lever 22 functions as a kind of link member, and it actuates the annulus part (slider) according to movement of the rib.

[0020]

FIG. 3 depicts a configuration example of an intersection part 11

of the support stretcher 20 of FIG. 2 and a supporting stretcher 102 of the umbrella body 10 (unlock lever 22 is omitted).

A groove 201a is configured in a connection part of an upper member 201 of the support stretcher 20 and a rib 101, to avoid
5 interaction between support stretcher 20 and support stretcher 102 which moves vertically when opening and closing an umbrella.

Also, as for the support stretcher 20 of FIG. 3, it assumes a configuration in which the supporting stretcher 102 is placed in
10 the groove 201a, and the supporting stretcher 102 is guided by the groove 201a during the operation to open and close an umbrella.

Thereby, fluctuation of an upper part of the umbrella relative to support stretcher 20 can be restrained.

15 Note that the example of FIG. 3 just shows a preferred example and can adopt many other forms.

For example, if a connecting point between the support stretcher 20 and rib 101 is moved to a position outward, for example, to a connecting point with the support stretcher 102 and a connecting
20 point between unlock lever 22 and rib 191 to further outside, interaction of support stretcher 20 and supporting stretcher 102 can be eliminated.

[0021]

FIG. 4 is a diagram showing a closed state of the umbrella of the
25 First Exemplary Embodiment.

When the umbrella of the first Exemplary Embodiment is closed, support stretcher 20 and unlock lever 22 move downward respectively in figure by rotation of the rib 101.

Because the connection point of unlock lever 22 and rib is placed
30 outer than the connection point of support stretcher 20 and rib, unlock lever 22 moves downward in figure relatively more than the support stretcher 20.

As a result, the annulus part of unlock lever 22 moves downward in figure over the support stretcher 20, and a pin 21 of support

stretcher 20 is pushed inward, to unlock the expansion and contraction mechanism of support stretcher 20.

[0022]

Note that as for the umbrella of this exemplary embodiment, an upper cylindrical member (upper ring) 51 serves as ferrule cover and hollow, and when the umbrella of FIG. 2 is completely open, an engagement rod 50 connected to a lower cylindrical member 52 penetrates a third cylindrical member 53 to be engaged in the upper cylindrical member 51.

Also, if the lower cylindrical member 52 is moved to a position as shown in FIG. 2, the opened state of the umbrella is maintained because a force that urges a rib to close pushes up the lower cylindrical member 52 through the support stretcher 102 upward.

Note that the method that keeps an umbrella open is not limited to this method. For example, a configuration may be employed in which latching mechanism or push lock mechanism is provided in an upper cylindrical member 51 side, and an insert engagement rod 50 with pawl is inserted into the upper cylindrical member, whereby engagement rod 50 is gripped and fixed due to engaging of the engagement rod 50 to the upper cylindrical member.

[0023]

Also, it assumes a configuration in which the umbrella concerning the present embodiment pulls up the engagement rod 50 downward to fold the umbrella.

As for the engagement rod 50 pulled up downward, it assumes a configuration guided by the third cylindrical member (third ring) 53 supported by an auxiliary stretcher 103 connected to support stretcher 102.

Thereby, the engagement rod 50 can be inserted surely into the upper cylindrical member 51, and the opening and closing of the umbrella is facilitated.

[0024]

FIG. 5 is a cross section diagram showing a lock mechanism

(locked state) of the umbrella of the First Exemplary Embodiment.

As shown in FIG. 5, a pin 21 of support stretcher 20 has a dome-shaped head part and a flat spring part, and it is biased
5 toward the outside (peripheral or radial direction) of support stretcher 20.

Because the head part of pin 21 projects from a hole provided on the support stretcher 20 side (outer member) when an umbrella opens from a closed state, the support stretcher 20 is maintained
10 in a stretched state.

[0025]

On the contrary, when an umbrella is closed, annulus part of unlock lever 22 moves downward as described before, pin 21 is pushed to inside of support stretcher 20, as shown in FIG. 6, and
15 engagement between outer members and the inner member of the support stretcher 20 is canceled.

As a result, the inner member of the support stretcher 20 can be received inside of the outer member, and the support stretcher 20 will contract as a whole.

20 [0026]

According to the umbrella of the present embodiment, an operation to close an umbrella and an operation to contract(shorten) the support stretcher 20 of the umbrella can be performed in succession.

25 The reason resides in the provision of the unlock lever 22 which works in associative with an operation to close an umbrella, and unlock the expansion and contraction mechanism of right and left support stretchers 20 at the same time.

Also, the fact that the stretched support stretcher 20 can be
30 shortened as discussed above, means that the length of the support stretcher 20 in the stretched state can be long.

Thereby, at the time of use mounting an umbrella, the umbrella is hard to swing back and forth in a line of advance (cf. FIG. 21 - FIG. 23).

Note that, in the example of FIG. 5, it has been explained that a pin 21 is biased by using a flat spring, but other springs such as coil spring or the like or other elastic bodies can be used for biasing the pin 21.

5 [0027]

[Second Exemplary Embodiment]

A Second Exemplary Embodiment of the present invention is described in detail with reference to the drawings successively. The present embodiment includes a change to the unlock
10 mechanism of the First Exemplary Embodiment, and other configurations are similar to configurations of the First Exemplary Embodiment.

The Second Exemplary Embodiment is described as follows centered on different points from the first Exemplary
15 Embodiment.

[0028]

FIG. 7 is a front view of an umbrella (closed state) of the Second Exemplary Embodiment of the present invention.

The difference from the First Exemplary Embodiment is that
20 unlock lever 22A is not on a rib side, but on the side of outer member (near a hand of user) of the support stretcher 20.

[0029]

The unlock lever 22a of the present embodiment is configured by an annulus part (slider) and a handle 221a in a state surrounding
25 circumference of the support stretcher 20, annulus part being slidable in a longitudinal direction of support stretcher 20, and the handle being able to operate a set(pair) of annulus parts at the same time.

[0030]

30 In this embodiment, unlock lever 22a does not connect with a rib, and the unlock lever does not work when an umbrella is merely closed.

For unlocking, as shown in FIG. 8, by pulling a handle 221a downward in figure (predetermined release operation), two

annulus parts slide downward at the same time, in a configuration to push a pin (not shown in figure) provided on the support stretcher 2.

[0031]

5 FIG. 9 is a cross section diagram showing a lock mechanism of the umbrella of the Second Exemplary Embodiment (locked state).

As shown in FIG. 9, pin 21 of support stretcher 20 has a dome-shaped head part with a slightly rounded profile and a flat
10 spring part, and the pin is biased outward of support stretcher 20.

When unlock lever 22a is in an initial position, because the head part of pin 21 projects from a hole provided on the support stretcher 20 side (outer member), the support stretcher 20 is
15 maintained in a stretched state.

[0032]

When unlock lever 22a is moved downward as shown in FIG. 10, the annulus part of the unlock lever 22a moves downward, and pin 21 is pushed inside of support stretcher 20, and engagement
20 between the outer member and the inner member of support stretcher 20 is canceled, as shown in FIG. 10.

As a result, the inner member of support stretcher 20 becomes able to be accommodated inside of the outer member, and the support stretcher 20 will contract as a whole.

25 [0033]

In the configuration of the present embodiment, length of the support stretcher 20 in the stretched state can be made also long. Also, there is an advantage that an umbrella does not expand and contract when carrying it by grasping the low end of the support
30 stretcher in the closed condition of umbrella in the present embodiment, because a lock of the expand and contract mechanism is not unlocked.

[0034]

[Third Exemplary Embodiment]

Next, details of a third exemplary embodiment will be described. The present embodiment made a change to an unlock mechanism of the First Exemplary Embodiment as follows, and other configurations are similar to configurations of the First Exemplary Embodiment.

The Third Exemplary Embodiment is described as follows centered on different points from the First Exemplary Embodiment.

[0035]

FIG. 11 is a front view of an umbrella of the Third Exemplary Embodiment (open state).

The difference from the First Exemplary Embodiment is the point where unlock button 22b is provided in a form to face each other inward of two support stretchers 20 instead of the unlock lever 22.

[0036]

Unlock button 22b in the present embodiment can be operated independently, but an umbrella is closed as shown in FIG. 12, and, in the condition that unlock button 22b are opposed to each other, support stretchers 20 are further brought closer, and lock of the expansion and contraction mechanism of support stretchers 20 becomes able to be canceled at the same time by operating the unlock buttons.

That is, the unlock buttons 22b function as unlock member to push pins 21 at the same time by continuing closing the umbrella thereby pushing, pins 21 simultaneously.

[0037]

FIG. 13 is a cross section diagram showing the lock mechanism of the umbrella of the Third Exemplary Embodiment (locked state).

As shown in FIG 13, the pin 21 of support stretcher 20 has the dome-shaped head part with a slight rounding and a flat spring part and is biased outside of the support stretcher 20.

For example, unlock button 22b is constructed by an elastic

member such as silicone rubber and the like, and it comprises a head part and a leg section as shown in FIG 13, the head part having an umbrella like shape and maintaining the unlock button 22b in an unoperated state to penetrate the support stretcher 20.

5 Because the head part of pin 21 projects from a hole provided on the support stretcher 20 side (outer member) in the condition where unlock button 22b is not operated, the support stretcher 20 is maintained in a stretched state.

10 Then, when the head part of unlock button 22b is pushed into the right side of FIG. 13, pin 21 is pushed, to unlock the expansion and contraction mechanisms of the support stretcher 20.

[0038]

15 When the support stretchers 20 provided with such unlock button 22b is brought to approach each other, as shown in FIG. 14, head parts of opposing unlock buttons 22b are pushed each other, as a result, lock of the expansion and contraction mechanisms of two support stretchers 20 will be canceled at the same time.

[0039]

20 As explained above, also in this configuration of the present embodiment, the length of the support stretchers 20 in the stretched condition can be taken long like the First and the Second Exemplary Embodiments.

25 Also, there is the advantage that an umbrella does not expand and contract when the umbrella is carried by grasping the low end of the support stretcher in the dosed condition of an umbrella because lock of the extension and contraction mechanism is not unlocked.

[0040]

[Fourth Exemplary Embodiment]

30 And, detail of a fourth exemplary embodiment will be described with reference to the figures.

FIG. 15 is a front view of an umbrella of the Fourth Exemplary Embodiment (open state).

Points greatly different from the First through the Third

Exemplary Embodiment include the following points. One point resides in that support stretcher 20A comprises a high-modulus material such as carbon or graphite, and another point resides in that lock / unlock mechanism 21a is implemented using warp of support stretcher 20A comprising this elastic material or the like.

[0041]

FIG. 16 is a cross section diagram of the lock mechanism of the umbrella of the Fourth Exemplary Embodiment (locked state).

In the example of FIG. 16, a lock mechanism 20A [sic.21A] comprising outer member 20L and inner member 20U is shown. A hole 212 is provided on outer member 20L, the hole being engageable with a terminal protrusion 211 of the inner member 20U.

When the umbrella is opened as shown in FIG. 15, the support stretchers 20A comprising an elastic material will warp outward, which results from spreading apart of a set (pair) of the support stretchers 20A (inner members 20U) disposed on the umbrella body side will flex outward (refer to alternate long and short dash line and support stretcher 20A of FIG. 15).

The condition in which the terminal protrusion 211 of inner member 20U is pressed against inward, terminal protrusion 211 of inner member 20U being abutted with the side wall of hole 212 is maintained by the deflection, and support stretcher(s) 20A is maintained in a stretched state.

[0042]

On the other hand, engagement of terminal protrusion 211 of inner member 20U with the hole 212 is canceled by being able to take the condition that warping of support stretchers 20A disappears when an umbrella is closed as shown in FIG. 17 and bent inward (cf. FIG. 18).

As a result, inner member 20U can be accommodated in the outer member 20L side, and support stretchers 20A can be contracted as shown in FIG. 19.

[0043]

As above, according to the present embodiment, only opening an umbrella can unlock the extension and contraction mechanism of two support stretchers at the same time and the lock can be canceled at the same time, and only closing the umbrella can unlock the mechanisms at the same time without operating unlock lever 22, 22a, or unlock button 22b.

[0044]

Here, how to use an umbrella of the Fourth Exemplary Embodiment will be explained as an example, relating to the present invention.

In a preferred embodiment of the umbrella relating to the present invention, rewind-type belt delivering mechanism 23 with springs, and the like can be provided in the bottom end of 20L of outer members of the support stretcher as shown in FIG. 20.

Of course, a belt delivering mechanism of FIG. 20 may be configured to couple the bottom end of the umbrella relating to the present invention with the belt of the user or a belt of waist part.

[0045]

FIG. 21 is a figure showing a usage mode of the umbrella of the Fourth Exemplary Embodiment.

In the example of FIG. 21, attachment and detachment-type neck strap 25 to bear on a neck is attached to the upper end of outer members 20L of support stretchers 20A and the belt delivering mechanism 23 that can deliver belt 24 is attached to the bottom end of 20L of the outer members.

In the example of FIG. 21, the bottom end of the umbrella is fixed by winding the above-mentioned belt 24 around the waist of the user and an upper end of the umbrella can be fixed in net strap.

An umbrella of the present embodiment can be used in a hands-free condition without restricting the upper bodies such as the shoulders, and the like of the user, as is also clear from FIG.

21.

[0046]

FIG. 22 is a figure showing another usage mode of the umbrella of the Fourth Exemplary Embodiment.

5 In the example of FIG. 22, a belt 25a is attached which is mountable to a rucksack and the backpack of the user instead of neck strap 25 as abovementioned.

The bottom end of the umbrella is fixed by also winding the above-mentioned belt 24 around the waist of the user in the
10 example of FIG. 22 and the upper end of the umbrella can be fixed by a belt 25a.

The umbrella of the present embodiment can be used in a hands-free condition without restricting the shoulders and the like of the user, as is also clear from FIG. 22.

15 [0047]

FIG. 23 is a figure showing another usage mode of the umbrella of the Fourth Exemplary Embodiment.

In the example of FIG. 23, a belt 24 is delivered and it is turned to the shoulder from the back of the user, and a condition of
20 fixing to the upper end(s) of 20L of outer members, and use is shown.

Also the umbrella of the present embodiment can assume an available embodiment as above without above-mentioned neck strap 25 and belt 25a.

25 [0048]

[Fifth Exemplary Embodiment]

A fifth Exemplary Embodiment of the present invention is described in detail with reference to the drawings successively. The Fifth Exemplary Embodiment made a change to the unlock
30 mechanism of the Second Exemplary Embodiment, and other configurations are similar to configurations of the Second Exemplary Embodiment.

The Fifth Exemplary Embodiment is described as follows centered on points different from the Second Exemplary

Embodiment.

[0049]

FIG. 24 is a front view showing the umbrella of the Fifth Exemplary Embodiment (open state).

5 The difference from the Second Exemplary Embodiment is the point where annulus part (slider) is provided in the condition that one end of unlock lever 22c is attached to one of two support stretchers 20 rotatably, and on the other one end of unlock lever 22c, an annulus part (slider) is slidably disposed surrounding a
10 periphery of the other one of the two support stretchers 20.

And a configuration is provided in which the annulus part is connected with a support stretcher which is different from the support stretcher to which the annulus part (slider) is arranged by link members.

15 [0050]

In this embodiment, when an umbrella begins to be closed in harmony with movement of support stretchers 20, the annulus part of unlock lever 22c will move in the upward direction of FIG. 24 over (along) the support stretcher 20.

20 When the umbrella is finally closed, as shown in FIG. 25, pin 21 is pushed into the support stretcher 20, to be unlocked.

[0051]

Like the present embodiment, as above, an operation to unlock an operation to close an umbrella and the expansion and contraction
25 mechanism of the support stretcher 20 of the umbrella can be also performed by a single motion even in the configuration without connection of an unlock lever with a rib.

[0052]

[Sixth Exemplary Embodiment]

30 A Sixth Exemplary Embodiment of the present invention is described in detail with reference to the drawings successively. In the Sixth Exemplary Embodiment, without use of a highly elastic material as a material of support stretcher 20, equivalent operationality as the Fourth Exemplary Embodiment may be

realized.

It is described centered on the different points from the embodiments of the first through the Fifth as follows.

[0053]

5 FIG. 26 is a front view showing an umbrella of the Sixth Exemplary Embodiment (open state).

The appearance-based different points from the First through the Fifth Exemplary Embodiments reside in that the groove 29 is provided on an outer member 20L of the support stretcher 20B, the groove 29 guiding movement of the pin provided in the
10 the bottom end of inner member 20U, that a belt member 26 is attached to one end of outer member 20L of the support stretcher 20B, the belt member 26 regulating an opening angle to outside direction of a support stretcher 20B, and that a cross section of
15 support stretcher 20B is rectangular.

[0054]

FIG. 27 is a cross section diagram showing the lock mechanism of an umbrella of the Sixth Exemplary Embodiment (locked state).

20 The outer side surface of one end of outer member 20L of support stretcher 20B of the present embodiment comprises on opening 27.

A pin 28 guided by a groove (rail) 29 disposed on the outer member 20L of support stretcher 20B is provided on the inner
25 member 20U of the support stretcher 20 as shown in FIG. 27.

When the inner member 20U of support stretcher 20B is pulled out along the groove 29 disposed on the outer member 20L of the support stretcher 20B, the pin 28 abuts to upper end of the groove 29, and the pull-out length is restricted.

30 When the umbrella is opened in this position, support stretcher 20B is bent intermediately centering on the pin 28, and can further open outward.

[0055]

Also, the opening angle of inner member 20U is restricted to a

predetermined angle $\theta 2$ that is bigger than the angle $\theta 1$ spanning the connecting portions between outer members 20L, because belt member 26 is attached to the tip of the opening of support stretcher 20B and the bottom end is set to a length corresponding to a condition abutted with the inner periphery of outer member 20L at a maximum pull-out of the inner member 20 U (cf. alternate long and short dash line of FIG. 26).

[0056]

Also, inside of the belt member 26, protruding part 261 engaging with a concavity 262 is provided on the inner member 20U side as shown in FIG. 27, by pulling out the inner member 20U from the outer member 20L to open the umbrella, the expansion and contraction mechanism of the support stretcher is locked in a stretched state.

Note that, in the present embodiment, penetrating groove 29 is provided on the outer member 20L, but groove 29 may be non-penetrating to prevent it from appearing from the outside. Also, the groove may be provided on the inner member 20U side, and the pin and the like may be provided on outer member 20L.

[0057]

When an umbrella of the present embodiment is closed, as shown in FIG. 28, engagement of the concavity 262 provided on the inner member 20U side with the protruding part 261 inside of the belt member 26 is disengaged because of the opening angle between inner members 20U becomes approximately same as the opening angle $\theta 1$ of outer members 20L, resulting in a condition to be able to receive inner member 20U in the outer member 20L. FIG. 29 is a cross section diagram of the lock mechanism of the umbrella of the Sixth Exemplary Embodiment (unlocked state).

[0058]

According to the sixth Exemplary Embodiment, similar to the Fourth Exemplary Embodiment, a configuration is obtained in which only opening an umbrella can unlock the extension and contraction mechanisms of two support stretchers at the same

time, and the lock can be canceled at the same time by only closing the umbrella, without operating unlock lever 22, 22a, unlock button 22b.

[0059]

5 Furthermore, in the present embodiment, there is an advantage that the material which is not elastic material including aluminum and iron can be used as a material of support stretcher 20B in the comparison with the Fourth Exemplary Embodiment. Also, in this respect, the present embodiment is advantageous in
10 the comparison with the Fourth Exemplary Embodiment in a case where increase in extension and contraction stages is desired.

[0060]

Also, in the Fourth Exemplary Embodiment, there are difficulty such as bending extent of inner member 20U and outer member
15 20L of support stretcher 20B and difficulty in material selection and design such as engaging dimensions of end projection of outer member 20L, but, in the present embodiment, such a constraint decreases.

In the present embodiment, typically, an opening angle between
20 support stretchers 20B can be determined by length of opening 27 and height of belt member 26.

Also, there is an advantage of thinning the thickness of the support stretcher, because a play (clearance) between the inner member 20U and outer member 20L is not utilized for the lock of
25 the extension and contraction mechanism either.

In this respect, the present embodiment is also advantageous when increase in extension and contraction stages is desired.

[0061]

Note that, in the sixth Exemplary Embodiment described above,
30 concavity 262 is provided on the inner member 20U side, and it was described to provide the protruding part 261 on the belt member 26 side, however, like Exemplary Embodiments of the First through the Fifth, the protruding part may be provided on the inner member 20U side and may provide the hole

corresponding to the protruding part on the belt member 26 side. Also, the cross section of support stretchers may be an oval and slot shape, an oval gold coin shape, quadrangle with rounded corners, and the like, without limiting the cross section of the support stretcher to a rectangular shape.

[0062]

Note that, in the sixth Exemplary Embodiment described above, the groove (rail) 29 and pin 28 are provided on the support stretcher 20, and restriction of the pull-out length (extension and contraction range) of the inner member 20U is performed, as shown in FIG. 30, a configuration in which the groove (rail) 29 and pin 28 are not provided is also adoptable.

In this case, expansion and contraction range can be restricted by varying the thickness of the diameter of the distal ends of inner member 20U or outer member 20L, or by providing the protruding.

[0063]

One embodiment of the present invention has been described as mentioned above, however, the technical scope of the present invention is not limited to each described above Exemplary Embodiment, and, without departing from the subject matter of the present invention, it goes without saying that various modification, replacement can be done.

For example, in each Exemplary Embodiment described above, the middle rod described in PATENT LITERATURE 1, 4 has been described as the type which was the umbrella of omitted or the abbreviated for the umbrella body, but the body portion of other forms of umbrellas and an equivalent matter can be used.

For example, as a body portion of the umbrella, ones equivalent to common foldable umbrella may be used provided that middle rod is omitted or shortened.

[0064]

Also, in each Exemplary Embodiment described above, number of stages of the extension and contraction mechanism of the support

stretcher has been described as one stage, however, two or more stages may be used of course.

In this case, as the unlock mechanism, a mechanism described in the third, the fourth, or the sixth exemplary embodiment can be preferably applied.

[0065]

Also, in each exemplary embodiment described above, the member of the umbrella body side of the support stretcher has been identified as an inner member, and the member of the footing side has been identified as outer member, however, the member on the umbrella body side may be termed outer member, and the member on the footing side may be termed as an inner member.

Reference Signs List

15	10	Umbrella body
	20, 20A, 20B	Support stretcher
	20U	Inner member
	20L	Outer member
	21	Pin
20	21A	Lock mechanism
	22, 22a, 22c	Unlock lever
	22b	Unlock button
	23	Belt delivering mechanism
	24	Belt
25	25	Neck strap
	25a	Belt
	26	Belt member
	27	Opening
	28	Pin
30	29	Rail
	50	Engagement rod
	51	Upper cylindrical member (upper ring)
	52	Lower cylindrical member (lower ring)
	53	Third cylindrical member

	101	Rib
	102	Stretcher
	103	Auxiliary Stretcher
	201	Top material
5	201a	Groove
	211	Terminal Protrusion
	212	Hole
	221a	Handle
	261	Protruding part
10	262	Concavity

Claims

[claim 1]

An umbrella comprising :

5 a supporting structure configured by including two support stretchers with one ends being connected to an umbrella body and the other ends being connected each other,

at least one stage of an expansion and contraction mechanism of said support stretchers, and

10 lock mechanisms adapted to lock an expansion state of said support stretchers when opening the umbrella.

[claim 2]

The umbrella according to claim 1, wherein the expansion and contraction mechanism of said support stretchers is
15 configured by at least one stage of an inner member and an outer member adapted to receive the inner member;

said lock mechanism is adapted to hold the inner member exposed from the outer member by engaging a protruding part of the inner member into a hole of the outer member; and

20 said lock mechanisms are adapted to allow both the two support stretchers to contract simultaneously by disengaging said protruding parts simultaneously.

[claim 3]

The umbrella according to claim 2, wherein said protruding
25 part is configured by a pin biased in a radially outer direction of said inner member by a spring; and

said two support stretchers are configured to contract by pushing said pins at the same time by sliding sliders disposed longitudinally slidably on the periphery of the outer member.

30 [claim 4]

The umbrella according to claim 3, wherein said sliders are connected to a rib of the umbrella with a link member, and said sliders are configured to push said pins at the same time when closing the umbrella.

[claim 5]

The umbrella according to claim 3, wherein said sliders are connected each other, and configured to push said pins at the same time through simultaneous sliding of said sliders by a
5 predetermined release action.

[claim 6]

The umbrella according to claim 3, wherein one of said sliders is connected with a link member to a support stretcher different from the support stretcher in which the slider
10 concerned is disposed, and the sliders are configured to slide so as to simultaneously push-in the pins by closing the umbrella.

[claim 7]

The umbrella according to claim 2, wherein said protruding part is configured by a pin biased in a radially outer direction of
15 said inner member by a spring;

the pins are placed at positions opposing each other of said support stretchers; and

an unlock member is arranged so as to push-in pins that have approached each other during closing-action of the
20 umbrella, simultaneously, by continuing closing action of the umbrella.

[claim 8]

The umbrella according to claim 1, wherein the expansion and contraction mechanism of said support stretchers is
25 configured by at least one stage of inner member and an outer member adapted to receive said inner mechanism, and

said lock mechanism is configured so as to be locked, when expanding said support stretchers and opening the umbrella, a pair of umbrella-body side of pair of the inner members or pair of
30 the outer members is caused to spread thereby engaging engagement parts of the inner member and the outer member.

[claim 9]

The umbrella according to claim 8, wherein said support stretchers are formed of an elastic member, and

when the umbrella is closed from an open state, spreading force between the umbrella side part of the pair of inner members or the pair of outer members is cancelled, and the umbrella side pair is caused to warp inward, whereby said locking is unlocked.

5 [claim 10]

The umbrella according to any one of claims 1 to 9, wherein

an upper ring having a hollow structure is provided;

10 the umbrella is adapted to close by moving a lower ring having an engagement rod downward from an open state where the lower ring is inserted in the hollow upper ring; and

a third ring is provided which guides movement of the lower ring, the third ring being supported by auxiliary stretchers respectively connected by a plurality of stretchers.

15 [claim 11]

The umbrella according to any one of claims 1 to 10, wherein a groove is disposed on a rib-connected end side of said support stretchers, the groove being adapted to guide movement of a stretcher supporting the rib during opening and closing of
20 the umbrella.