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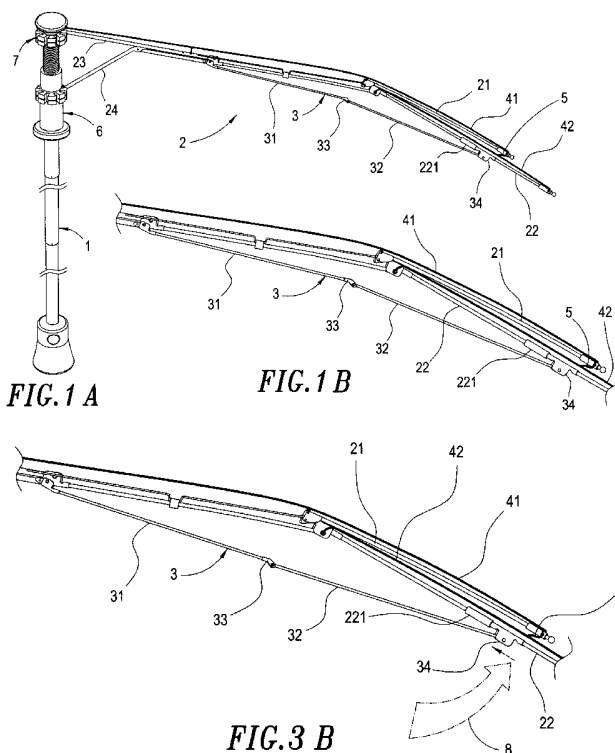
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GB 2397015 A GB 2390016 A
GB 2359745 A WO 2002/062169 A1

(58) Field of Search:
UK CL (Edition X) A4B
INT CL⁷ A45B
Other:

(54) Abstract Title: Collapsible umbrella having wind-resisting structure

(57) A collapsible umbrella comprises a telescopic shaft 1 with a fixed notch 7 at the top and a slider 6 below. A plurality of multi-sectioned main ribs 2 are attached to the notch by inner rib sections 23 and attach to outer rib sub-sections 21,22. A first umbrella cover 41 extends over both the inner rib sections 23 and the shorter, upper rib sub-sections 21. A second umbrella cover extends over the longer, lower rib sub-sections 22. A gap exists between the two rib sub-sections and this gap is restricted by a plurality of resilient bands 5 to allow air to pass between the two covers and to retain integrity of the structure. Auxiliary ribs 3 are pivotally attached between the middle of the inner rib sections 23 and a sleeve 34 sliding over the lower rib sub-section that engages with a stopper 221. The auxiliary ribs allow the umbrella to be deformed partially due to wind pressure from above and provide stiffness to the structure when wind pressure 8 is exerted from below.



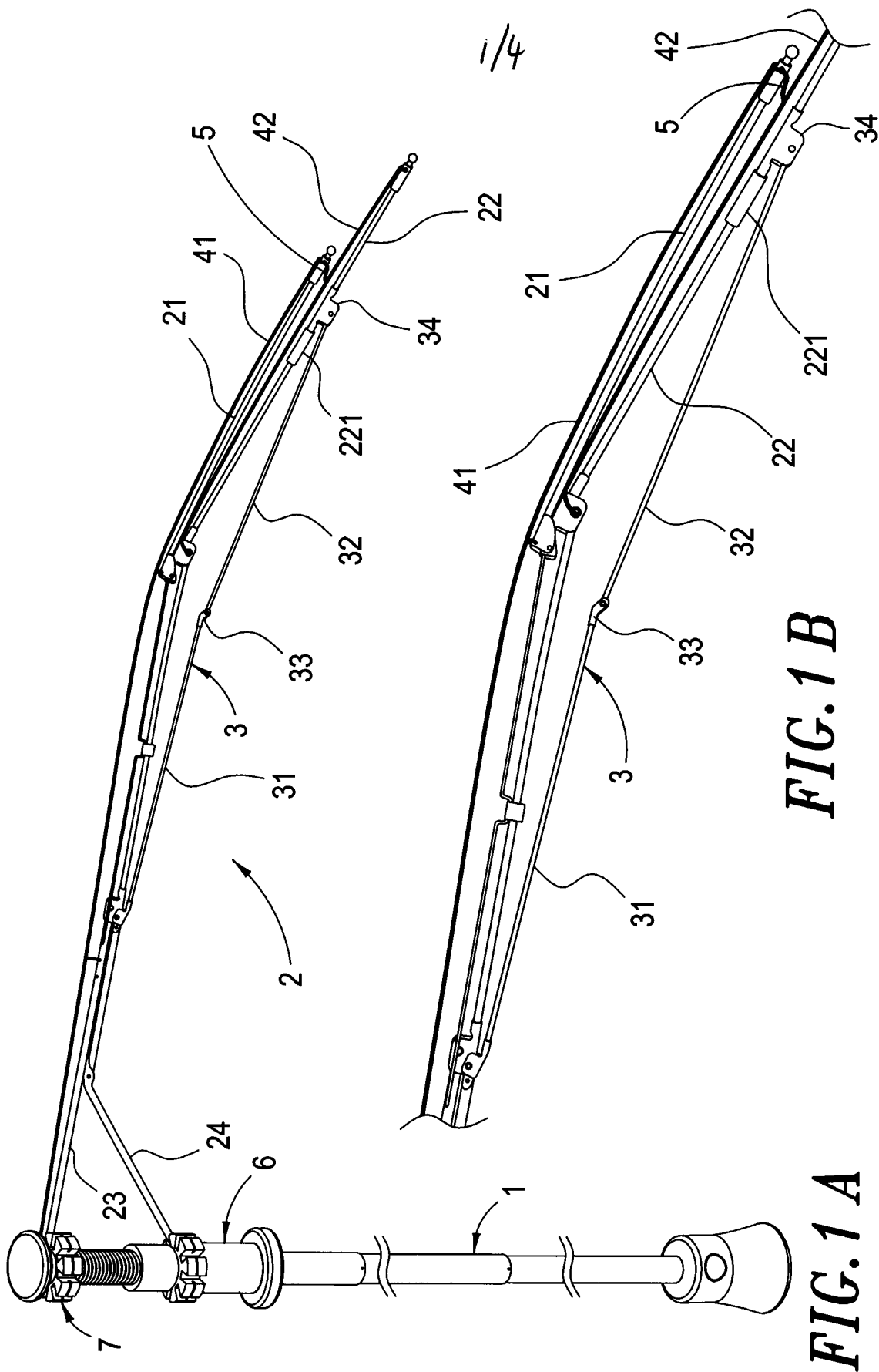


FIG. 1 B

FIG. 1 A

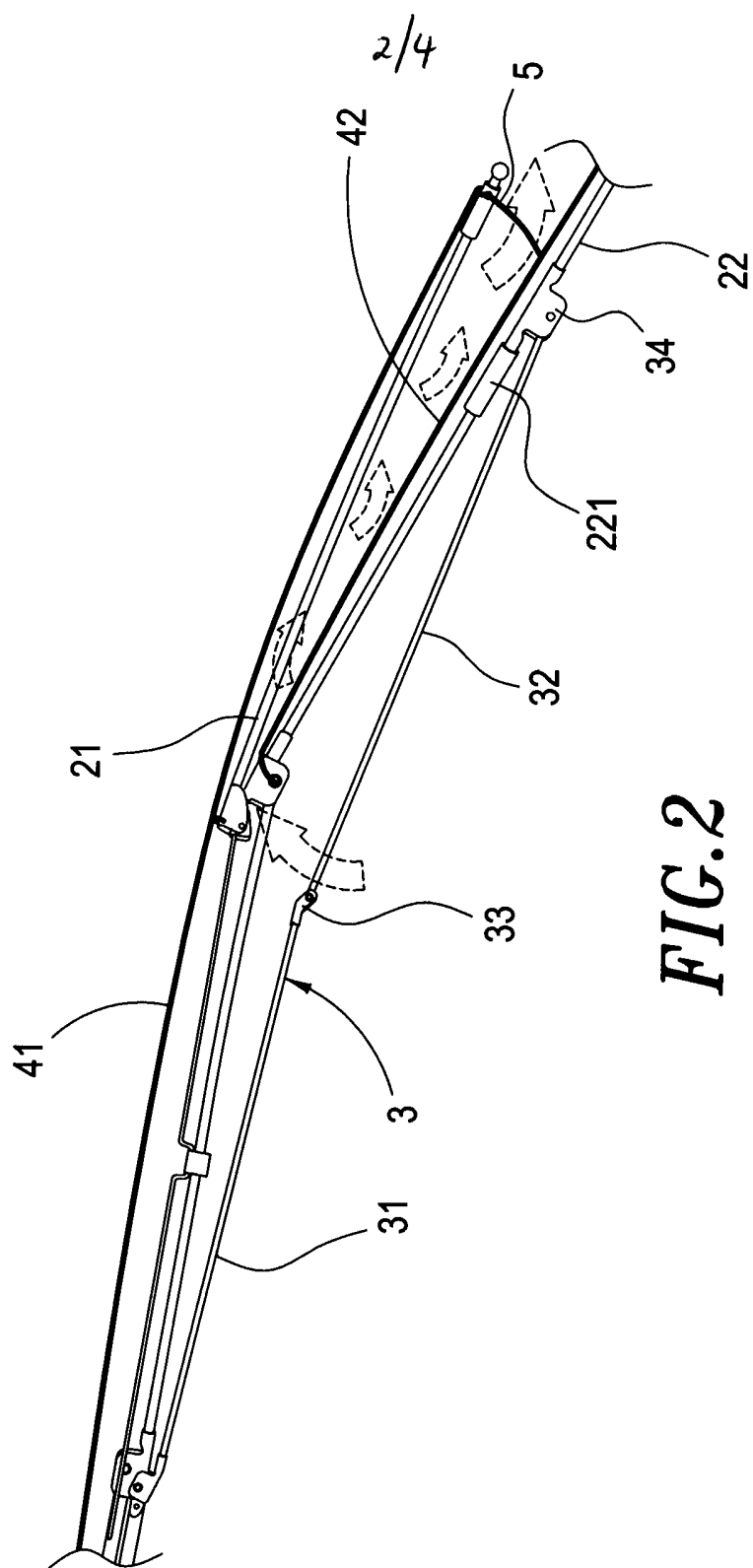


FIG. 2

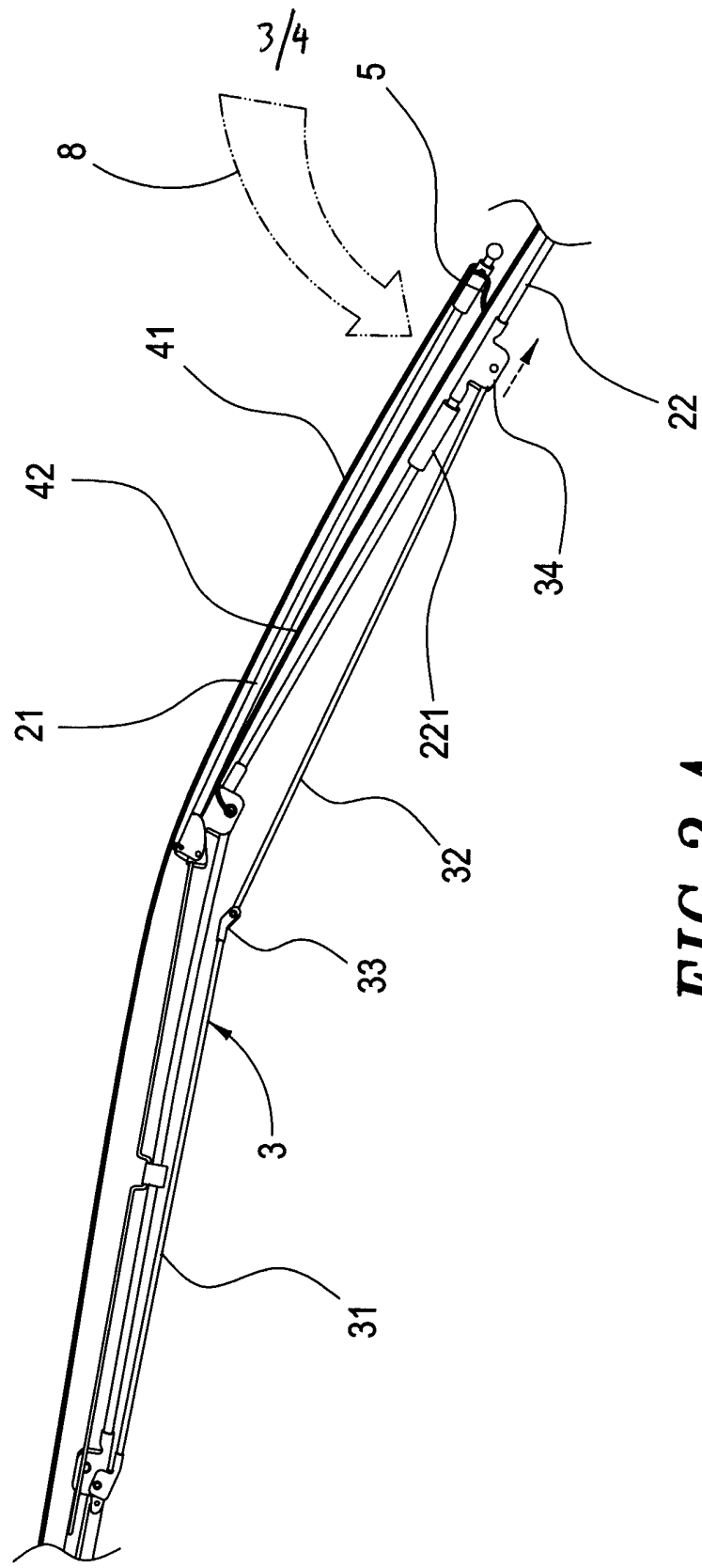


FIG.3 A

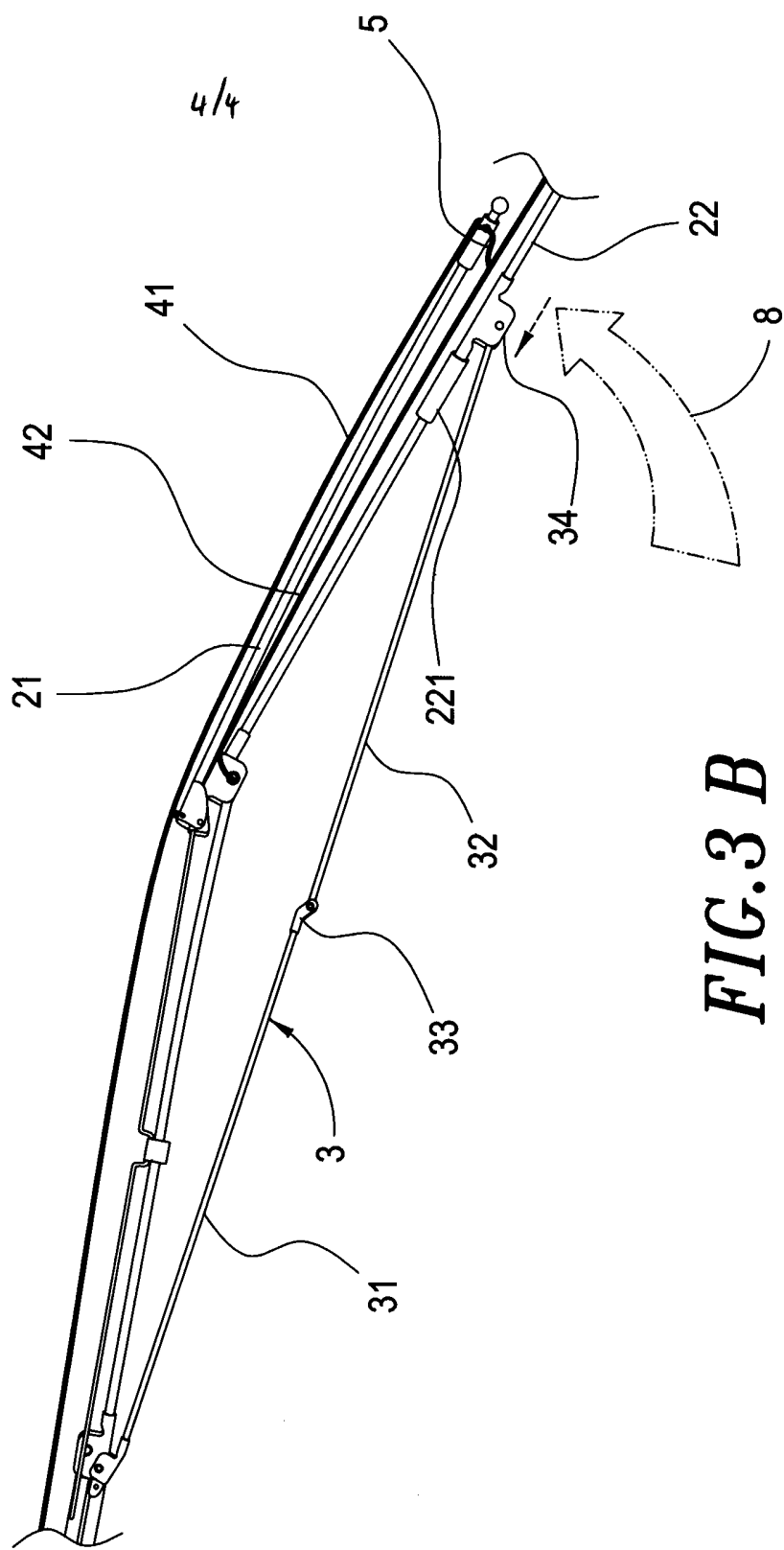


FIG. 3 B

Reinforced Structure for Collapsible and Wind Resistible Umbrella

BACKGROUND OF THE INVENTION

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1. Field of the invention

The present invention relates to a reinforced structure for collapsible and wind resistible umbrella, and more particularly, to a structure for a collapsible umbrella whose multi-sectionalized main rib has an auxiliary rib bridging between the front end of last section of the main rib and the second section of the main rib such that the umbrella is strongly structured wind resistible.

2. Description of the Prior Art

An umbrella is one of the important accoutrements. In a sunny day, it may be employed as a parasol to shade harmful ultra violet ray, while in a rainy day, it is used to keep away the rain drips from the user's body so as to protect the user clean and healthy. Either the umbrella or the parasol was prevalent in bygone time, it still prevails in the present day, and surely it will be necessary in the future.

There are many types of umbrellas selective in the market, such as a normal type, a two-fold type, a three-fold type etc., all serve the user with their portability. However, in the

structure of a multi-collapsible umbrella, too many nodes for supporting umbrella ribs may results in weakening the mechanical strength to withstand the wind pressure such that the umbrella is often collapsed and ruined by a strong wind
5 force and pouring rainfall notwithstanding the wind attacks the outer surface of the umbrella cover as a wind pressure, or attacks the inner surface thereof as an extract force.

It is what the reason the inventor of the present invention has endeavored for years by continuous research and
10 experimentation attempting to find out the remedy to rectify the inherent shortcomings of the conventional umbrella described above, and at last has succeeded in realizing the present invention.

15 SUMMARY OF THE INVENTION

These features and advantages of the present invention will be fully understood and appreciated from the following detailed description of the accompanying Drawings.

20 Accordingly, it is an object of the present invention to provide a reinforced structure for collapsible and wind resistible umbrella whose multi-sectionalized main rib has an auxiliary rib bridging between its front end of the first section and the second section of the main rib such that the
25 umbrella can be strongly structured wind resistible.

It is another object of the present invention that the last section of the main umbrella rib is divided into unequally length, and the first and second sub-sections almost paralleled laid such that two umbrella covers can be laid on it in a superposing configuration with a fissure formed there between so as to release the wind force thereby achieving the wind resistible structure.

It is one more object of the present invention that in the above mentioned structure a resilient band is provided with one end fastened to the end of the first sub-section of the main rib and the other end sewn to the second sub-section of the main rib such that the first and the second subsection of the main rib can be kept apart with an appropriate distance by the elastic force of a resilient band thereby protecting the first section of the main rib from being overturned by the strong wind force.

To achieve these and other objects mentioned above, the reinforced structure for collapsible and wind resistible umbrella is composed of a plurality of multi-sectionalized main umbrella ribs and auxiliary ribs, a first and a second umbrella covers, and a plurality of resilient bands. Wherein the last section of the main umbrella rib is divided into unequally length, almost paralleled laid first and second subsections. The former is shorter in length and is laid above the latter. The auxiliary rib is bridging between the front end

of the first subsection and the second subsection. The first umbrella cover fixes its one end to an upper nest, while its other end is sewn onto the end of the first subsection of the main umbrella rib. The second umbrella cover fixes its one
5 end to the head terminal of the second subsection of the main umbrella rib, while its other end is fixed to the end of the second subsection of the main umbrella rib. In this manner the rear portion of the first umbrella cover is superposed over the front portion of the second umbrella cover leaving a fissure
10 there between so as to release the wind flow out there from.

The resilient band which fixes its one end to the end of the first subsection of the main umbrella rib and sews its other end onto the second umbrella cover can limit the separation between the two sub-sections of the main rib by its
15 resiliency so as to prevent overturning of the first subsection of the main rib. The auxiliary rib bridging between the front end of the first section of the main rib and the second section of main rib can strongly enhance the umbrella structure to resist a violent wind attack.

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BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1A and 1B are partial schematic views of the reinforced structure for collapsible and wind resistible
25 umbrella according to the present invention;

Fig. 2 is an illustrative view showing how the umbrella of the present invention releases the wind force; and

Figs. 3A and 3B are the illustrative views demonstrating the operation of the umbrella structurally acting against the
5 wind attack in an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figs. 1A and 1B, the wind resistible umbrella
10 of the present invention comprises a telescoping backbone 1, an upper nest 7, a lower nest 6, a plurality of multi-sectionalized main ribs 2, a plurality of auxiliary ribs 3, a first umbrella cover 41, a second umbrella cover 42, and a plurality of resilient bands.

15 The telescoping backbone 1 which being used to sustain the whole weight of the umbrella is formed of a plurality of telescoping tube sections.

The upper nest 7 is fixed to the cap of the umbrella on the top of the backbone 1.

20 The lower nest 6 is loosely sleeved over the backbone 1 to be slid up and down along it.

Each of the multi-sectionalized main umbrella ribs 2 is formed of several rib sections hinged together, wherein the last section is divided into unequally length, almost paralleled
25 laid first subsection 21 and second subsection 22. The former

is shorter in length than the latter and is laid above the latter.
A stopper 221 is provided at a proper position on the second
subsection 22. The uppermost sub-section 23 of the main
umbrella rib 2 is tightened to the upper nest 6 with its head
5 end and is supported by a brace 24 on the lower nest 5. By so
the multi-sectionalized main umbrella rib 2 is able to stretch
when the lower nest 6 moves up along the telescoping back
bone 1.

The auxiliary rib 3 is composed a first portion 31 and a
10 second portion 32. The first portion 31 is jointed to the front
end of the last section of the main umbrella rib 2 with its one
end, while its other end is formed into a hinge joint 33 and is
hinged with one end of the second auxiliary rib portion 32,
and the other end of the second auxiliary rib portion 32 is
15 terminated at a sleeve 34 which being sleeved over the second
subsection 22 of the main umbrella rib 2 such that the sleeve
34 is slid to and fro on the latter, with the stroke thereof
controlled and limited by the stopper 221.

The first umbrella cover 41 is sewn to the upper nest 6
20 with its one end, and is sewn to the end of the first subsection
21 of the main umbrella rib 2 with its other end.

The second umbrella cover 42 is sewn to the head
terminal of the second subsection 22 of the main umbrella rib
2 with its one end, and is sewn to the end of the second
25 subsection 22 of the main umbrella rib 2. In this manner the

front portion of the first umbrella cover 41 is superposed over the rear portion of the second umbrella cover 42 leaving a fissure there between so as to release the wind flowing out there from.

5 The resilient band 5 which fixes its one end to the end of the first subsection 21 of the main umbrella rib 2 and sews its other end onto the second umbrella cover 42 is elaborately intercalated and concealed in the fissure formed between the two covers 41, 42 so as to avoid spoiling the appearance of
10 the umbrella. As shown in Fig. 2, when the umbrella is subjected to a strong wind attack, the resiliency of the resilient band 5 can check the separation between the two subsections 21, 22 of the main umbrella rib 2 so as to prevent overturning of the first subsection 21 and recover its initial
15 state.

To understand how the umbrella structure of the present invention acts against the strong wind attack, reference can be made to Figs. 3A, 3B which show an embodiment of the present invention. As an wind force 8 downwardly attack the
20 umbrella to bend down the first subsection 21 of the main rib 2 the sleeve 34 to which the second portion 32 of the auxiliary rib 3 is terminated will receive a thrust force imparted from the first subsection 21, this thrust force is then successively imparted to the first portion 31 of the auxiliary
25 rib 3 and is acting as a compressive force to the first portion

31 to sustain the umbrella to protect it from being crashed downwardly. After the wind calms down, the first and second sub sections 21, 22 of the main umbrella rib 2 together with the auxiliary rib 3 recover their initial state. One the other
5 hand, in the case the wind force pulls up the umbrella, the second subsections 22 of the main rib 2 will be bent upwardly, this wind force imparted to the above mentioned sleeve 34, the second portion 32 (terminated to the sleeve 34), the first portion 31 of the auxiliary rib 3 will act as a tensile force to
10 the above structural components. The upward overturning and collapsing of the umbrella is prevented by checking excessive backward displacement of the sleeve 34 by the stopper 221 provided to the second subsection 22 of the main rib 2. After the wind calms down, the first and second subsections 21, 22
15 of the main umbrella rib 2 together with the auxiliary rib 3 recover their initial state. In this manner the damage to the main umbrella ribs and auxiliary ribs by the strong wind attack can be avoided so as o prolong the umbrella's lifetime.

In all, the reinforced structure for collapsible and wind
20 resistible umbrella disclosed herein has several noteworthy advantages compared to the conventional collapsible umbrella obtainable in the market, namely:

1.The elaborately designed jointing technique applied to joint umbrella main ribs and auxiliary ribs substantially
25 enhances the mechanical strength of the umbrella structure to

withstand the strong wind attack and avoid overturning of the whole umbrella due to bending stress even breaking the umbrella ribs.

2.The elaborate design idea that the last sections of the
5 main umbrella ribs to be divided into the shorter first subsections and the longer second subsections makes it possible to lay two umbrella covers leaving a fissure there between so as to release the wind flowing out there from thereby avoiding the damage to the umbrella by wind force.

10 3.The resilient band provided between the first subsection of the main rib and the second umbrella cover contributes to keeping a definite separation between the first and second subsections of the main rib section so as to prevent the umbrella from overturning.

15 Many changes and modifications in the above described embodiment of the invention can, of course, be carried out without departing from the scope thereof. Accordingly, to promote the progress in science and the useful art, the invention is disclosed and intended to be limited only by the
20 scope of the appended claims.

What is claimed is:

1.A reinforced structure for collapsible and wind resistible umbrella comprising:

5 a telescoping backbone, an upper nest, a lower nest, a plurality of multi-sectionalized main umbrella ribs, a plurality of auxiliary ribs, a first umbrella cover, a second umbrella cover, and a plurality of resilient bands, wherein each of the last section of said multi-sectionalized main
10 umbrella ribs is divided into almost paralleled laid shorter first subsection and longer second subsection, the former is laid above the latter, said first umbrella cover is covered over between said upper nest and said first subsection, and said second umbrella cover is covered over said second
15 subsection such that the front portion of said first umbrella cover is superposed over the rear portion of said second umbrella cover, furthermore, said auxiliary rib is composed of a first and a second portions, said first portion is jointed to the front end of the last section of said main umbrella rib
20 with its one end, while its other end is formed into a hinge joint and is hinged with one end of said second auxiliary rib portion, and the other end of said auxiliary rib portion is terminated at a sleeve which being sleeved over said second subsection of said main umbrella rib.

25 2.The reinforced structure of the umbrella as in claim 1,

wherein said sleeve to which said second auxiliary rib portion being terminated is capable of sliding sleeve over said second subsection of said main umbrella rib.

- 3.The reinforced structure of the umbrella as in claim 1,
5 wherein a stopper is provided for said second subsection of said main umbrella rib to control and limit the sliding stroke of said sleeve.



INVESTOR IN PEOPLE

Application No: GB0508086.6

Examiner: Mr Hal Young

Claims searched: 1-3

Date of search: 10 August 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A		GB2397015 A (HSEIH)
A		WO2002/062169 A1 (YUNG)
A		GB2359745 A (QURESHI)
A		GB2390016 A (HALL)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

A4B

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

A45B

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, JAPIO