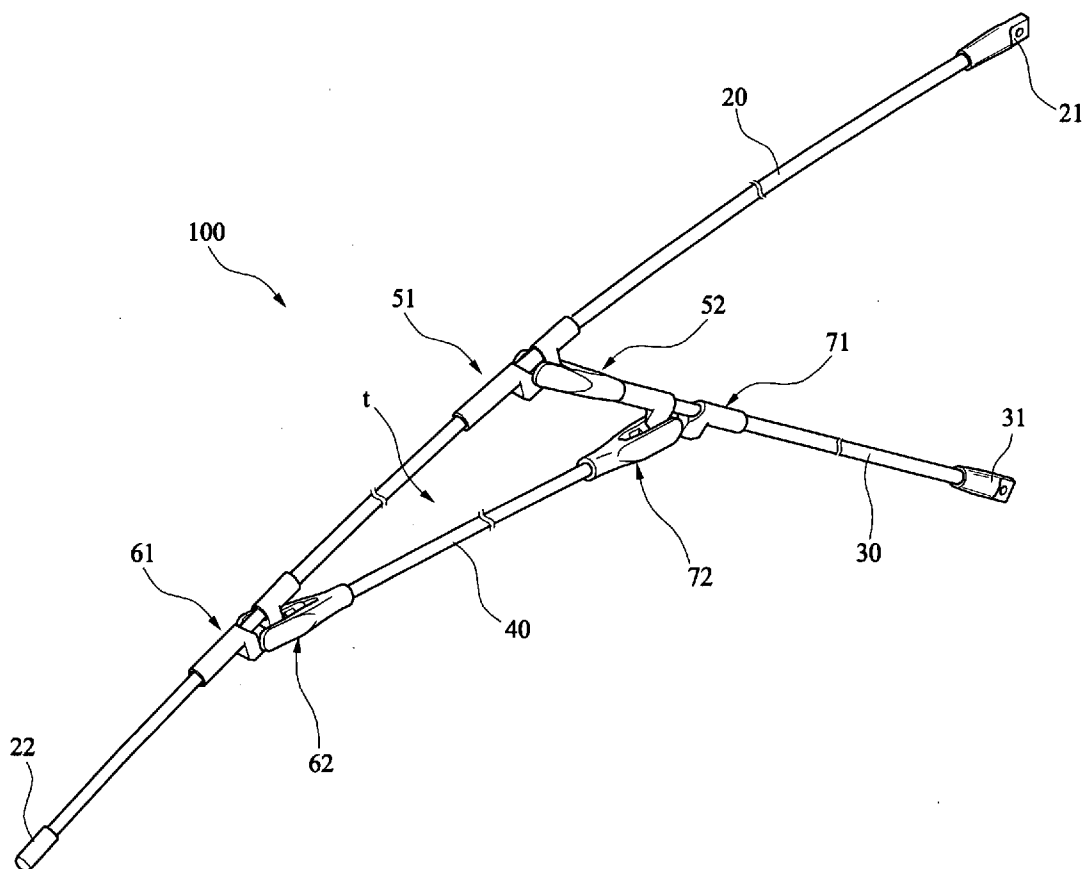




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(19) **United States**(12) **Patent Application Publication**
You(10) **Pub. No.: US 2011/0108074 A1**(43) **Pub. Date: May 12, 2011**(54) **WINDPROOF UMBRELLA**(76) Inventor: **Ching-Chuan You, Taipei (TW)**(21) Appl. No.: **12/591,174**(22) Filed: **Nov. 12, 2009****Publication Classification**(51) **Int. Cl.**
A45B 25/06 (2006.01)
A45B 11/00 (2006.01)(52) **U.S. Cl.** **135/20.1; 135/31**(57) **ABSTRACT**

A windproof umbrella includes a shank (10); a runner (12) on the shank (10); ribs (20); a canopy (101); stretchers (30); U-shaped first joints (51) each secured onto the rib (20); U-shaped second joints (61) each slidably put on the rib (20); U-shaped third joints (71) each secured onto the stretcher (30); auxiliary rods (40); and sets of first, second, and third pivotal members (52, 62, and 72). The first pivotal member (52) is formed at the other end of the stretcher (30) and is pivotably connected to the first joint (51). The second pivotal member (62) is formed at one end of the auxiliary rod (40) and is pivotably connected to the second joint (61). The third pivotal member (72) is formed at the other end of the auxiliary rod (40) and is pivotably connected to the third joint (71). In response to strong wind, the second joint (61) slides to change an angle between the rib (20) and the stretcher at the first joint (51). Therefore, the wind escape capability of windproof umbrella (1) of the invention is greatly increased.



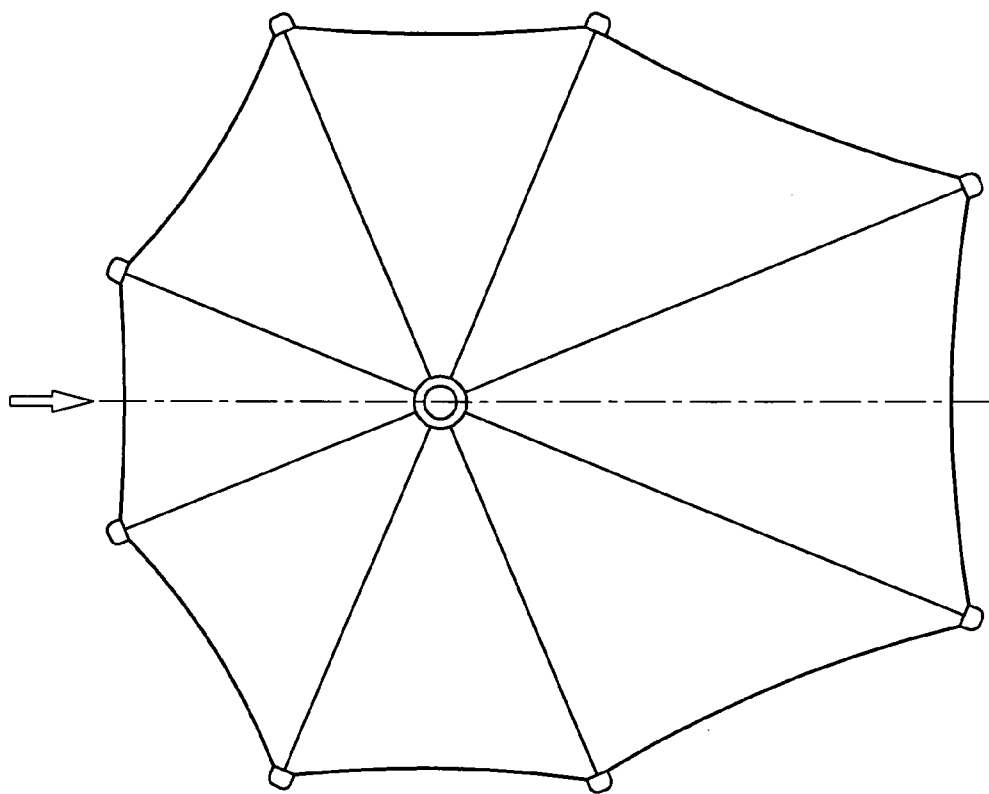


FIG.1(PRIOR ART)

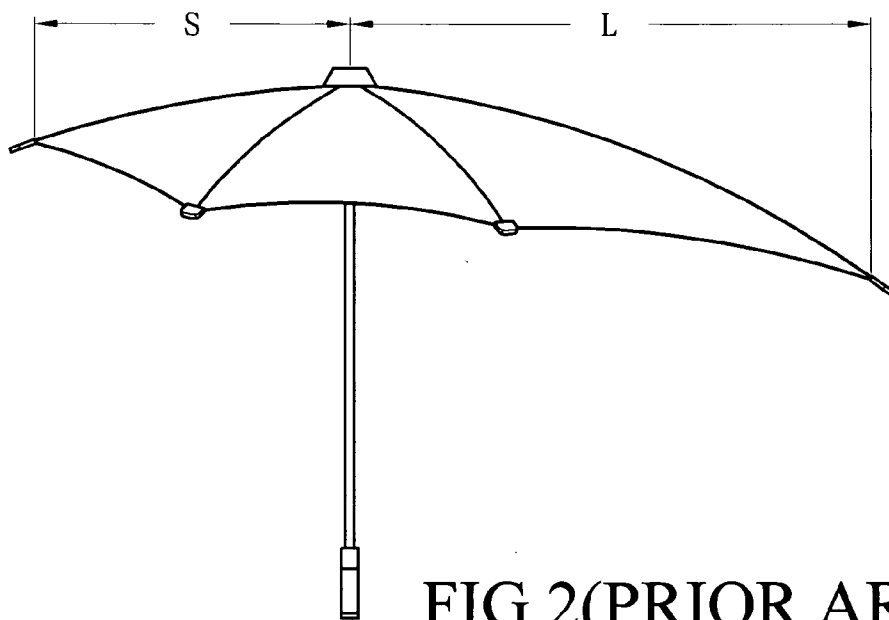


FIG.2(PRIOR ART)

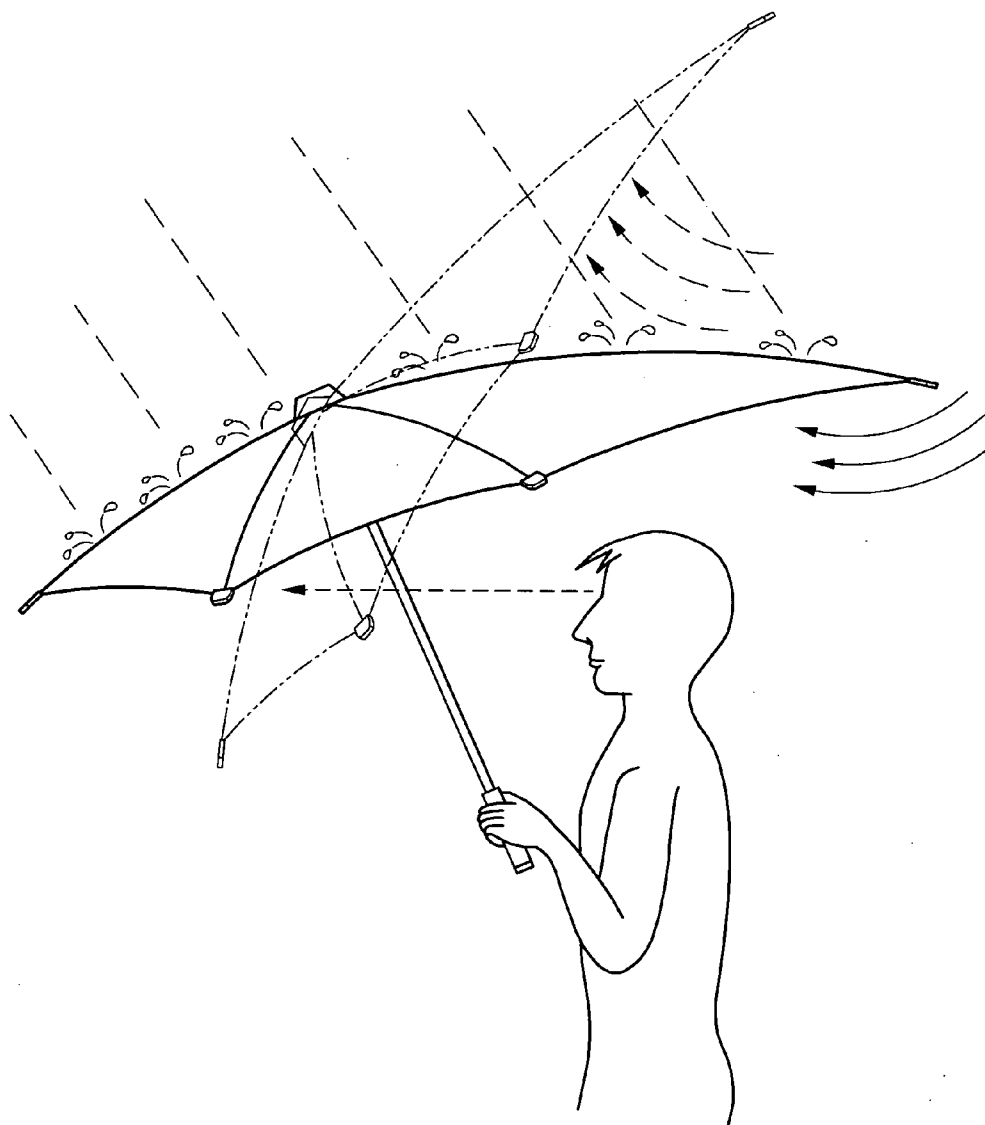


FIG. 3(PRIOR ART)

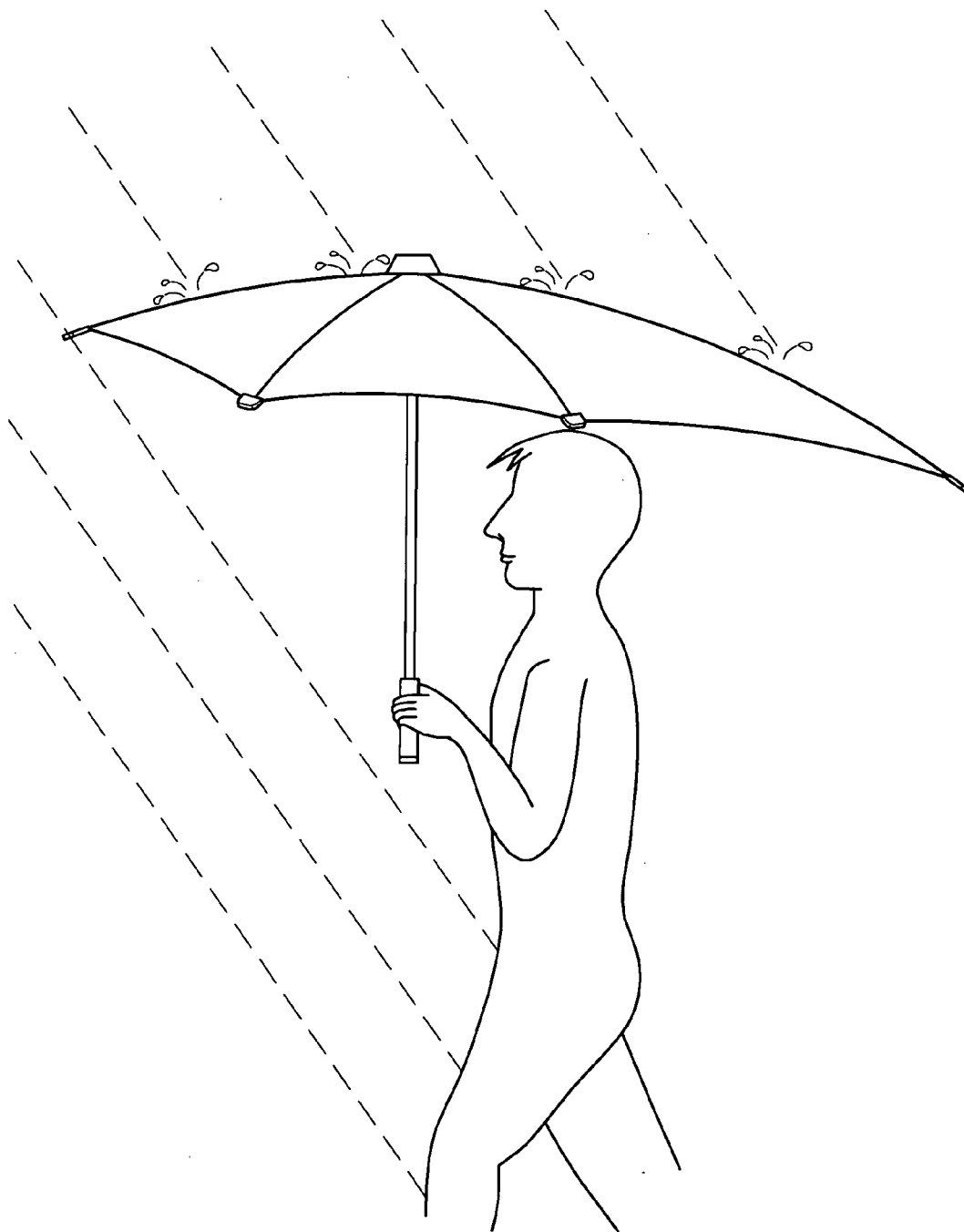


FIG.4(PRIOR ART)

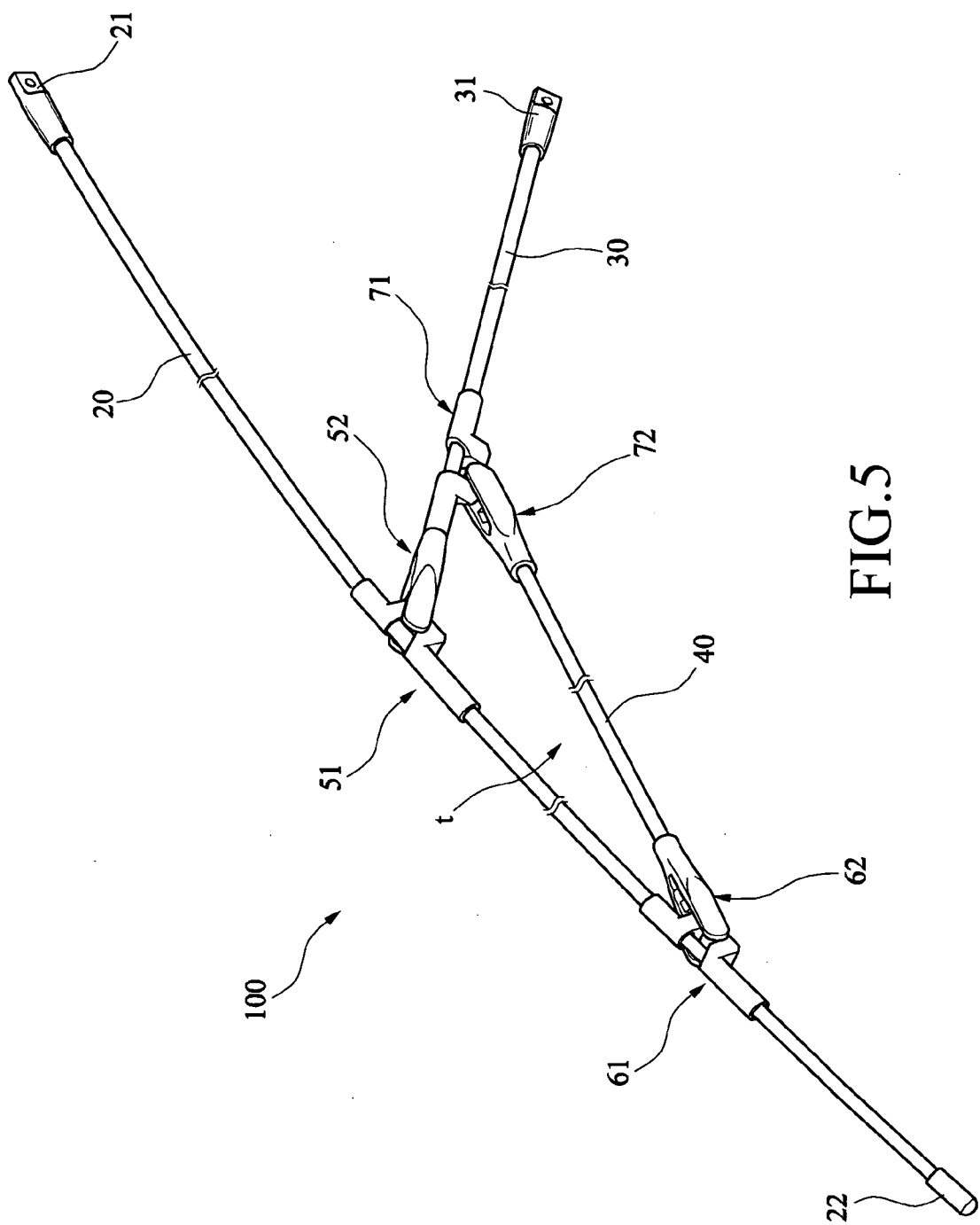


FIG. 5

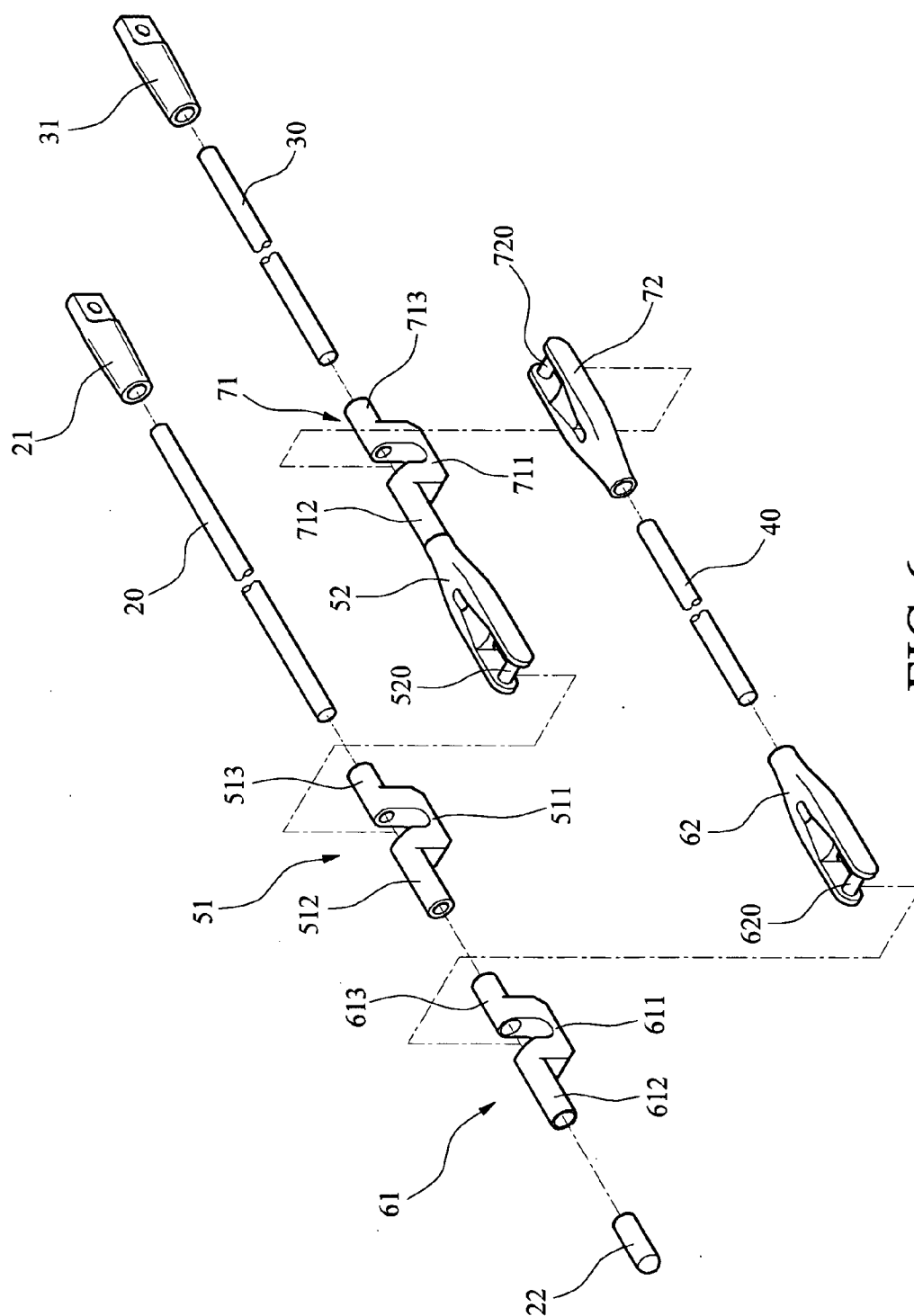


FIG. 6

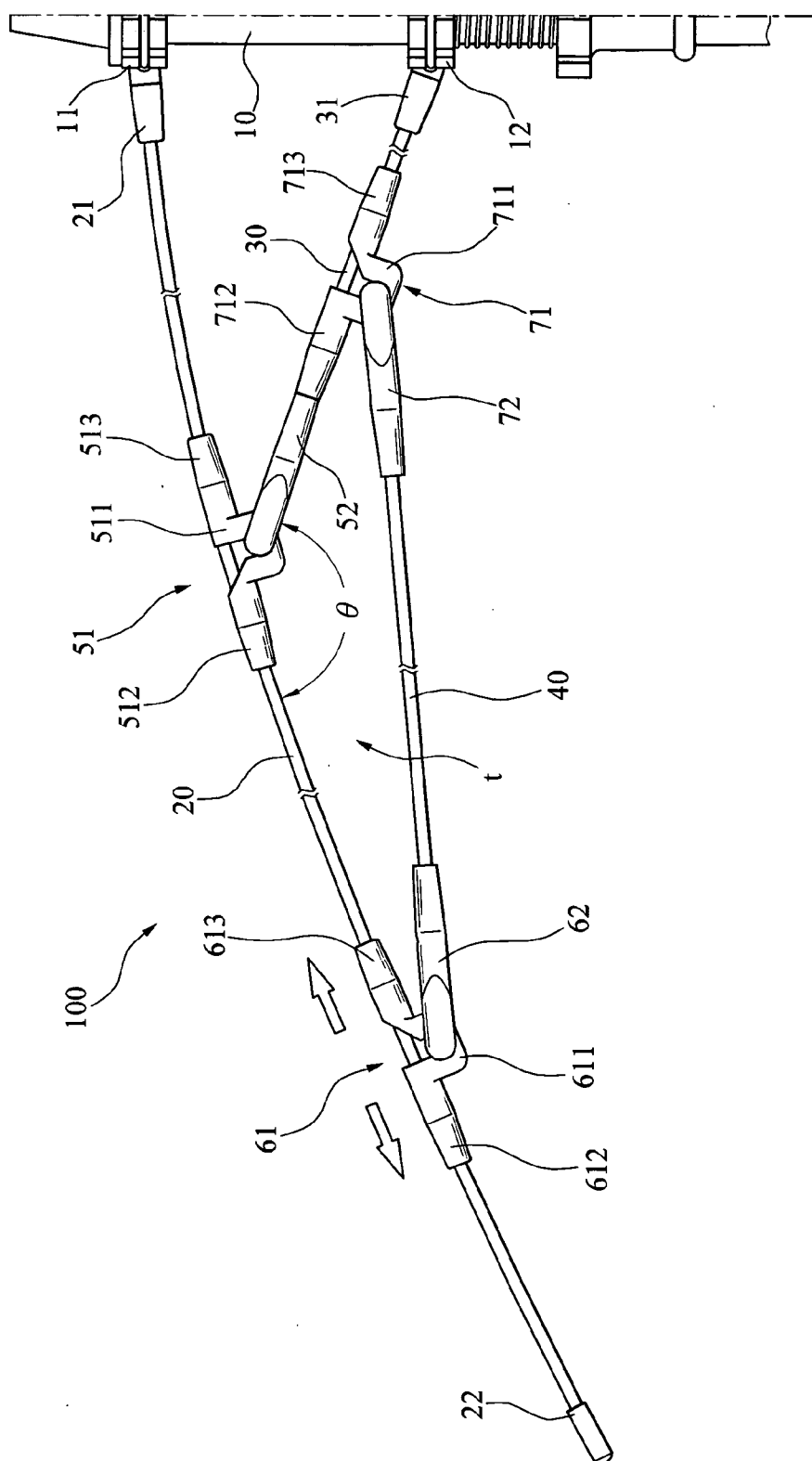


FIG. 7

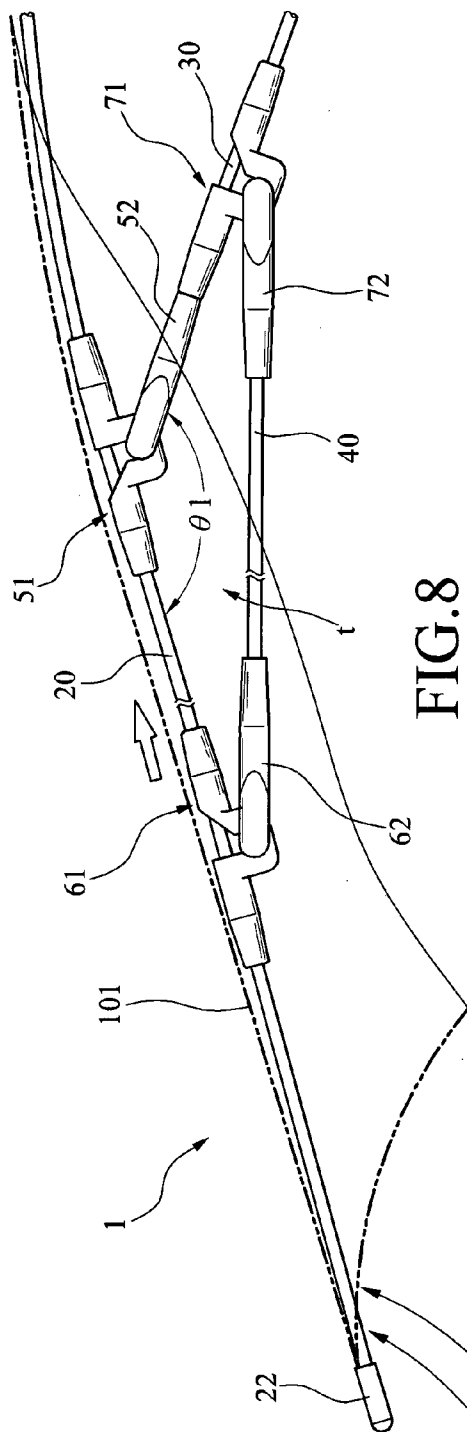


FIG. 8

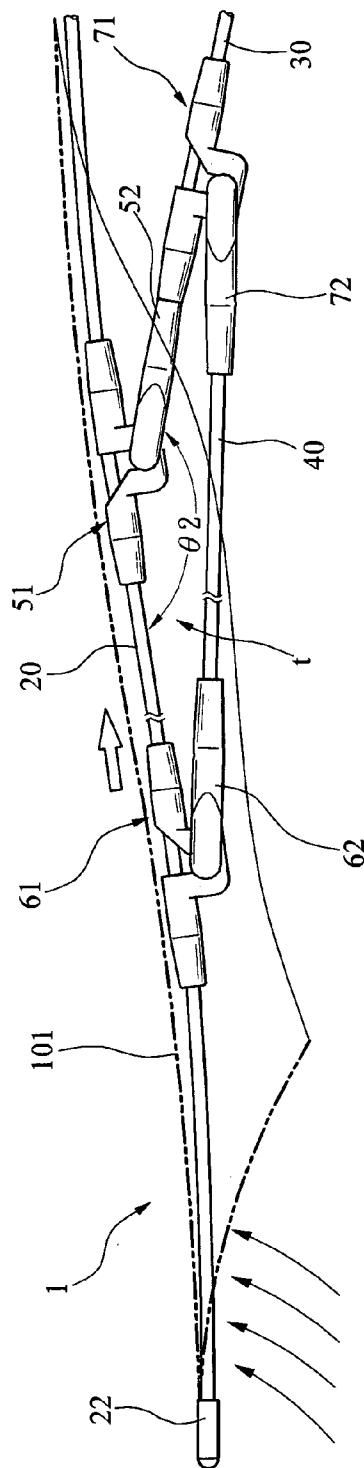


FIG. 9

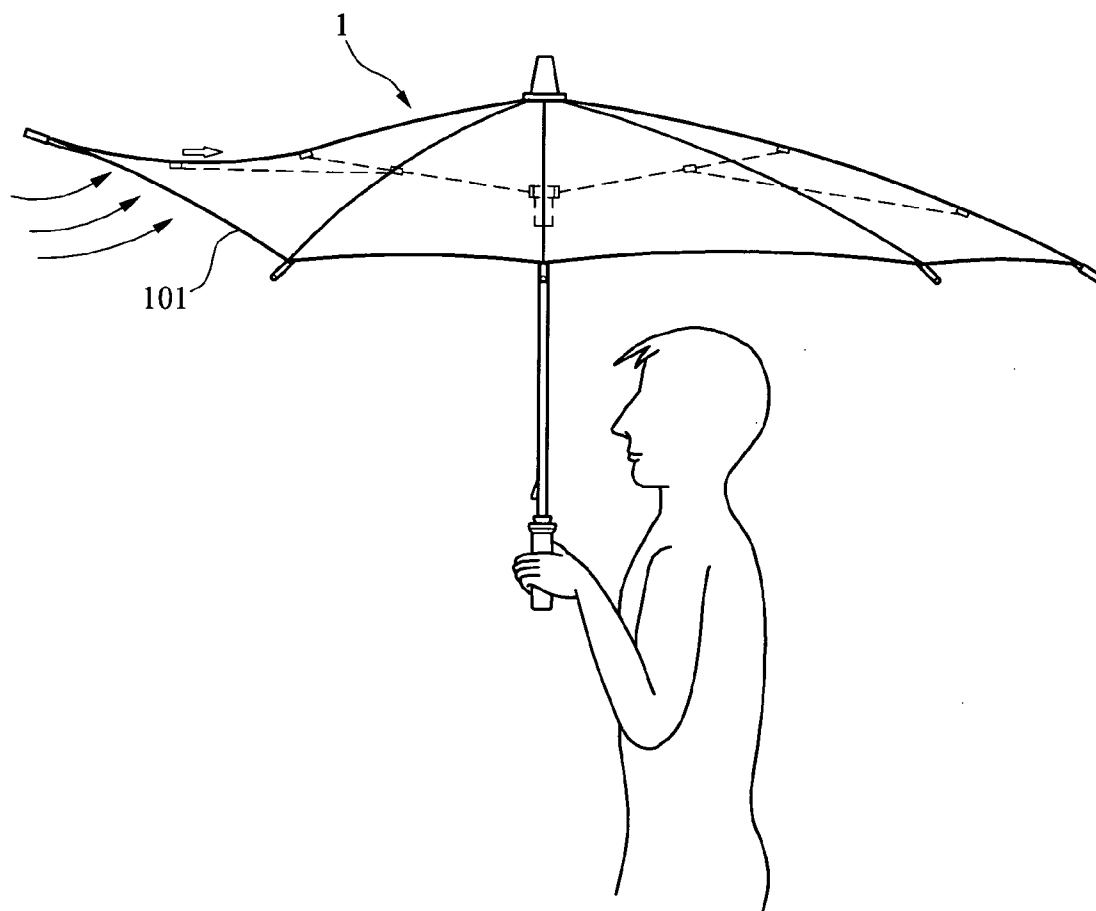


FIG.10

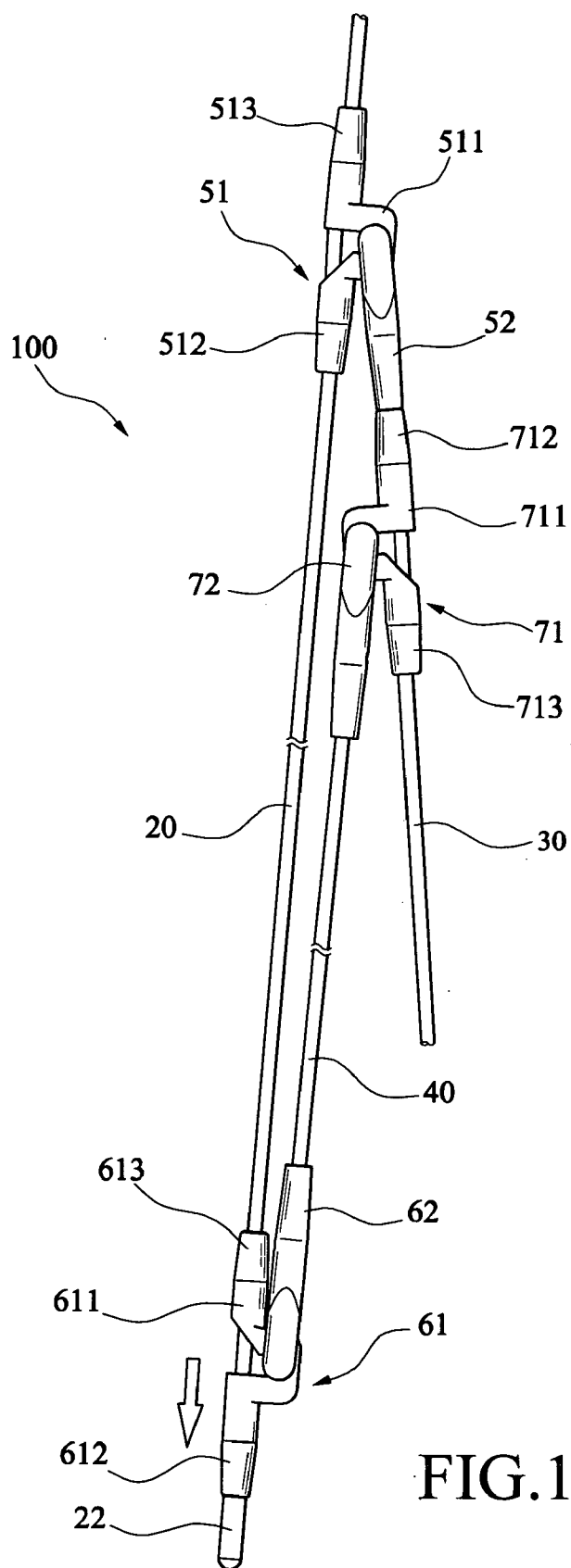


FIG.11

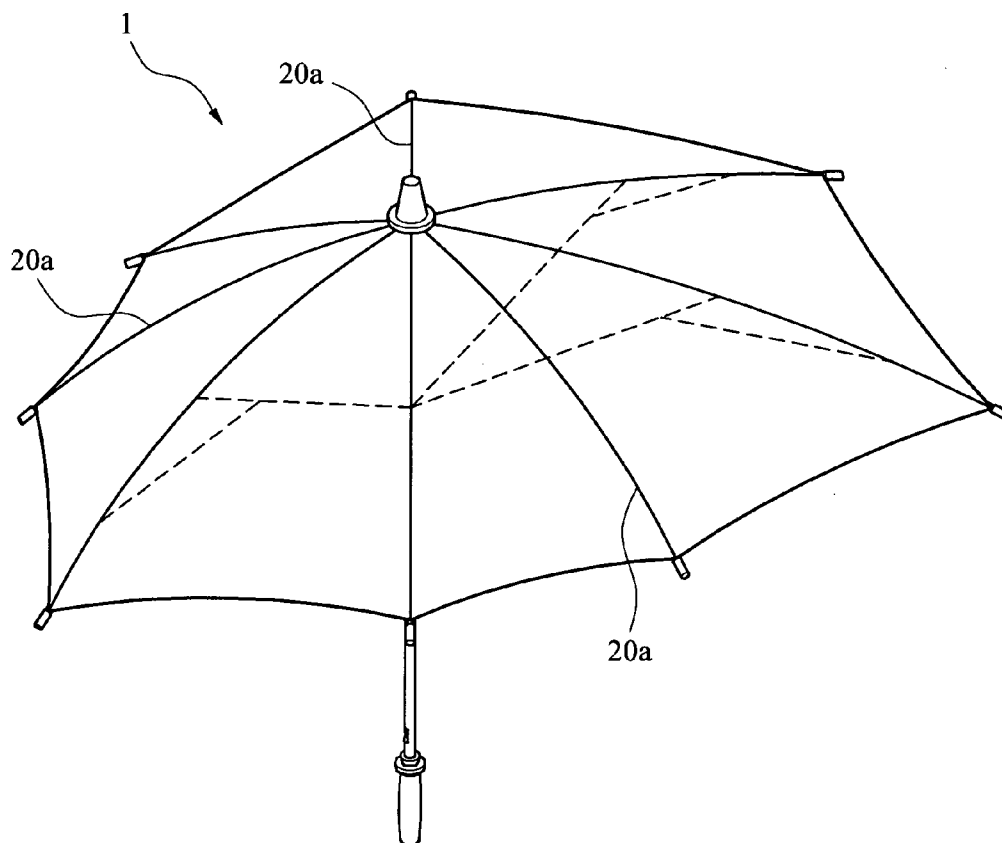


FIG.12

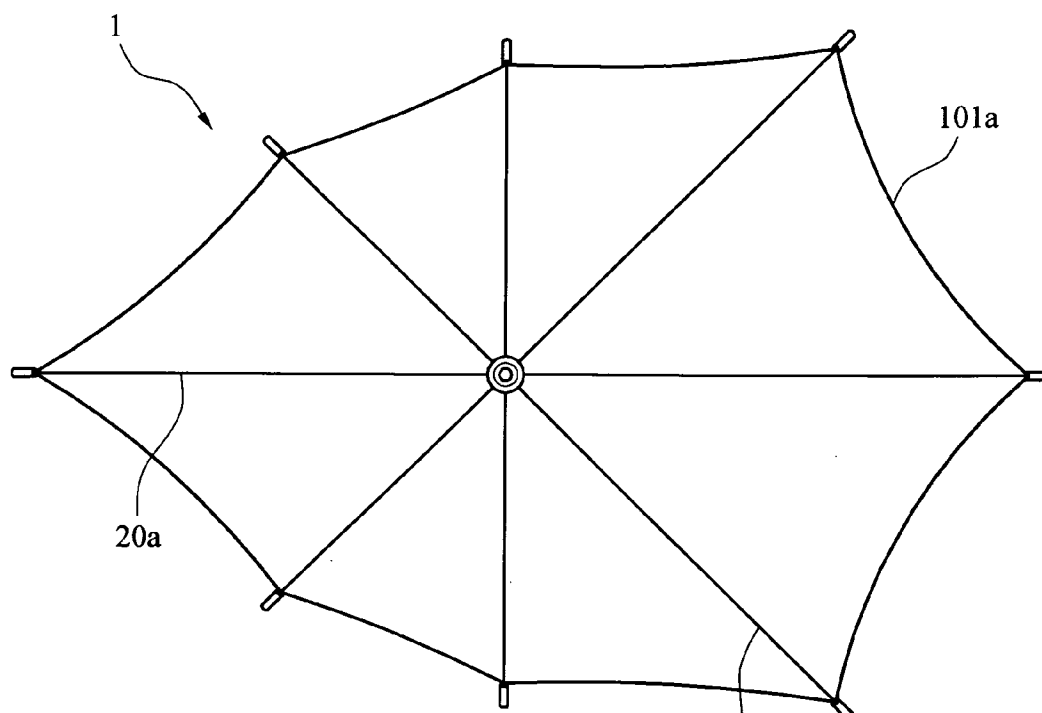


FIG.13

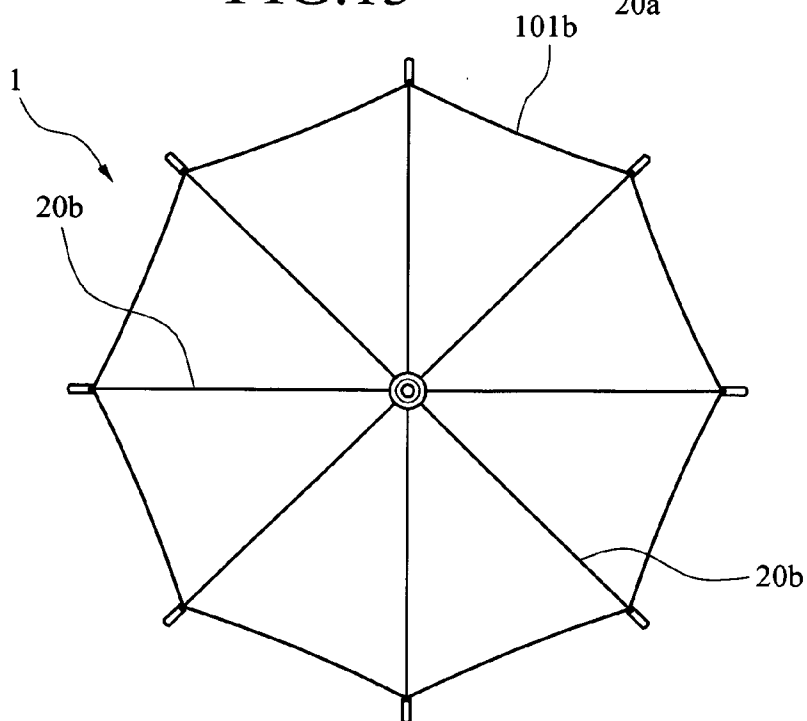


FIG.13A

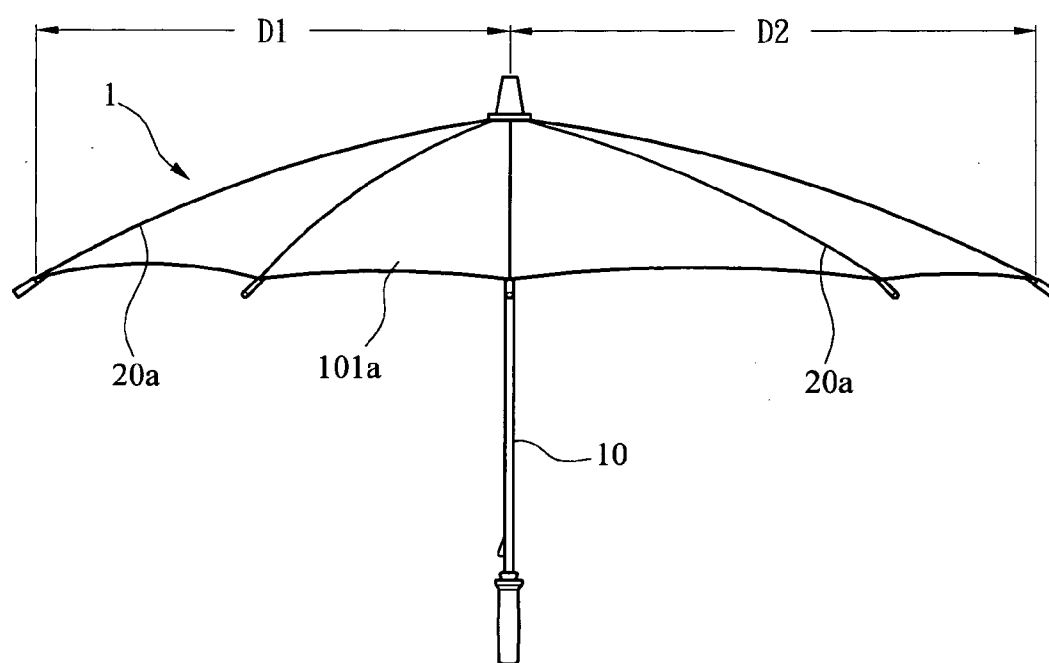


FIG.14

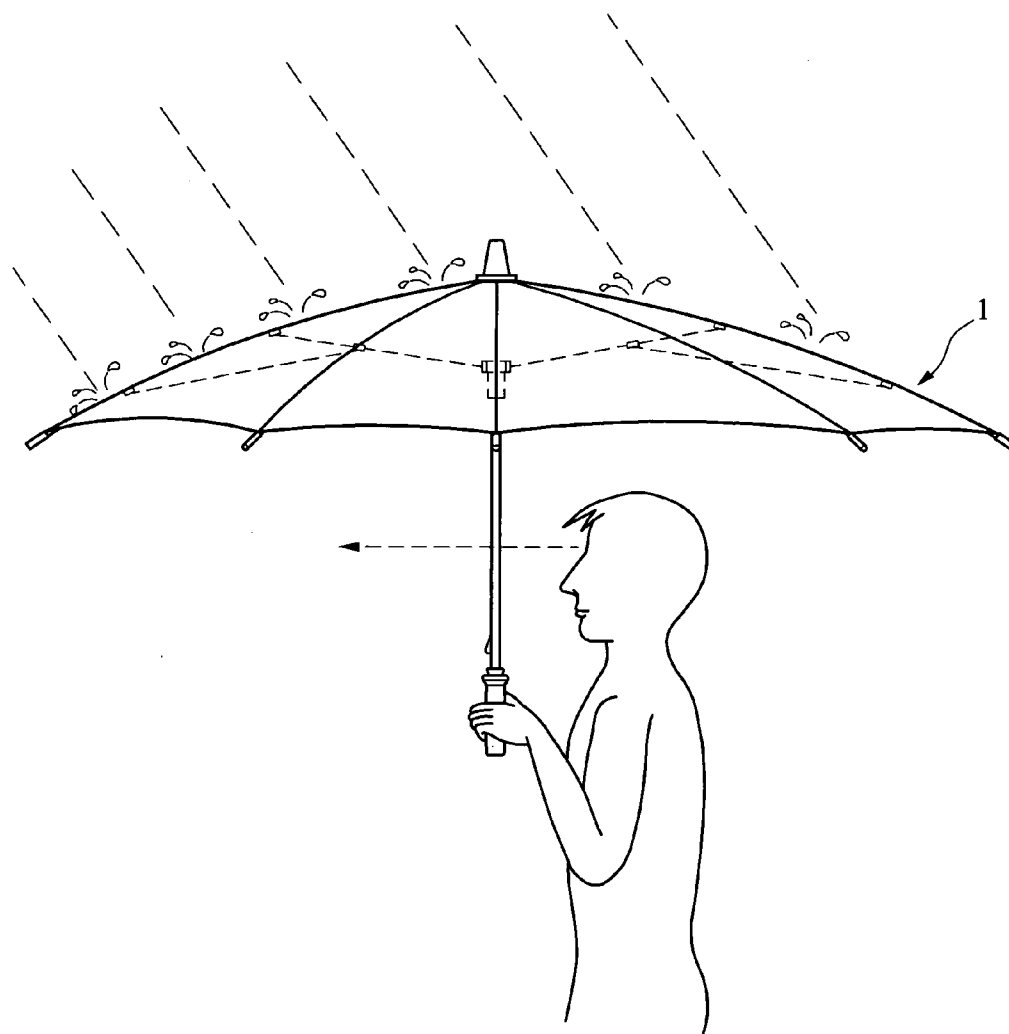


FIG.15

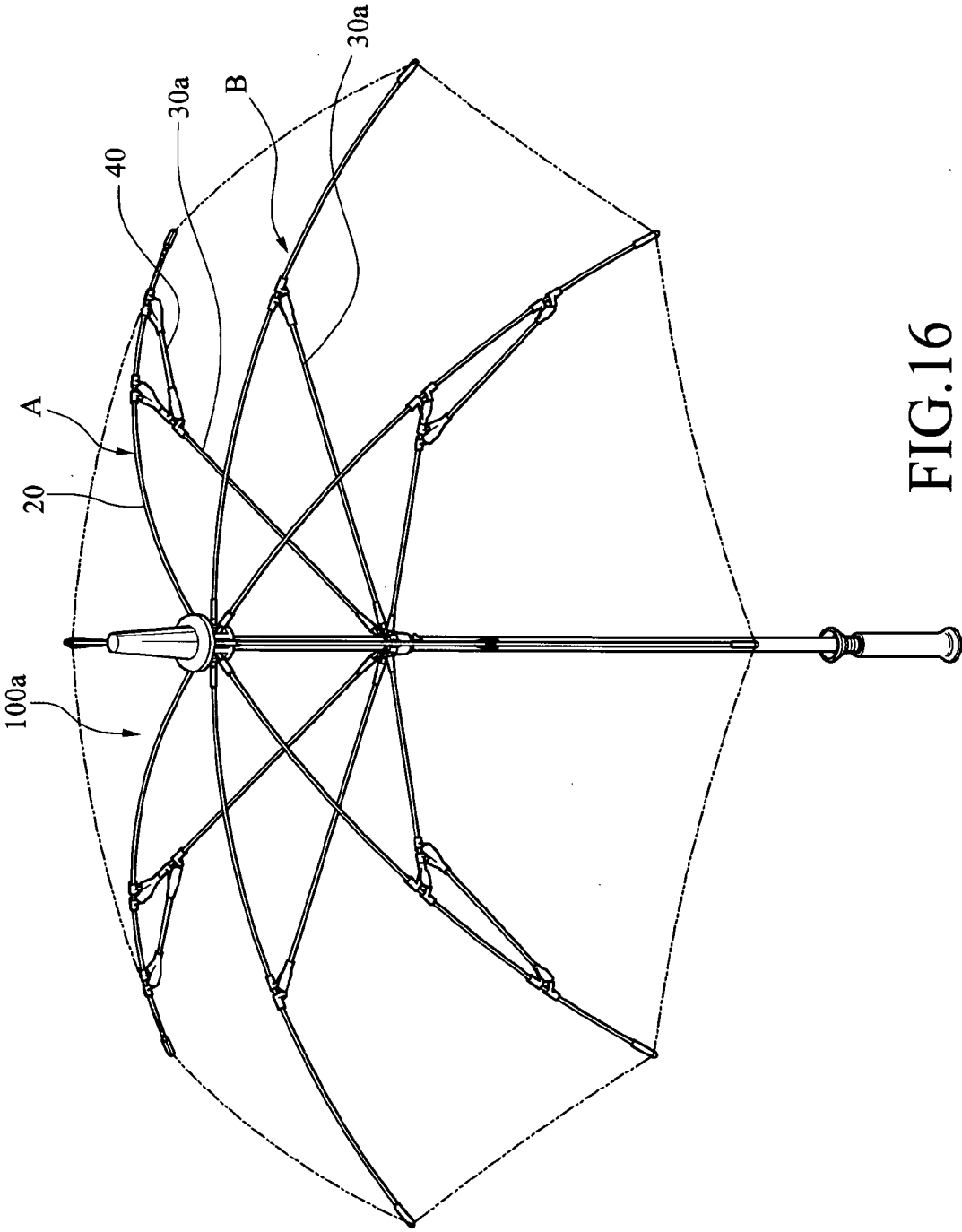


FIG.16

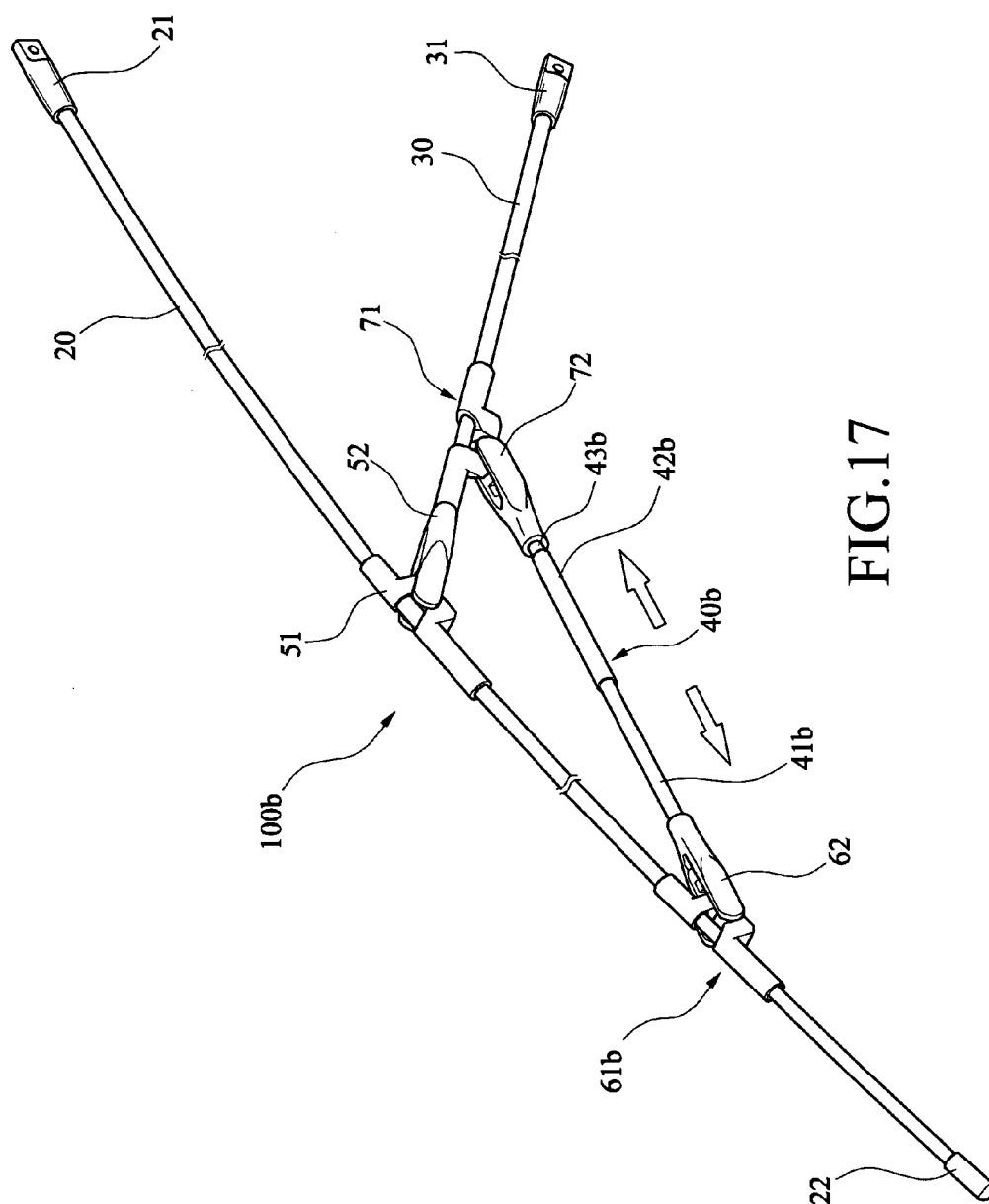
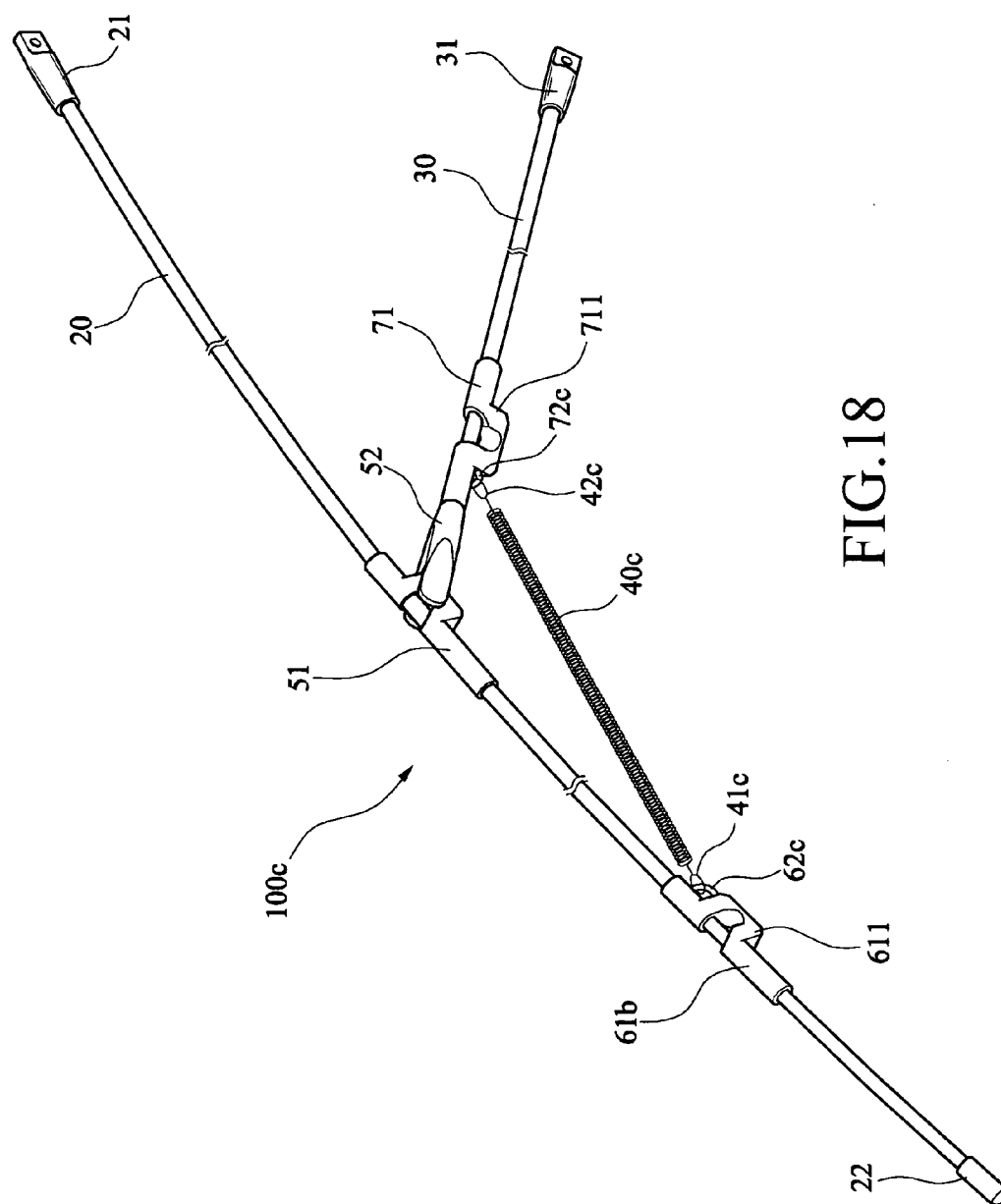


FIG.17



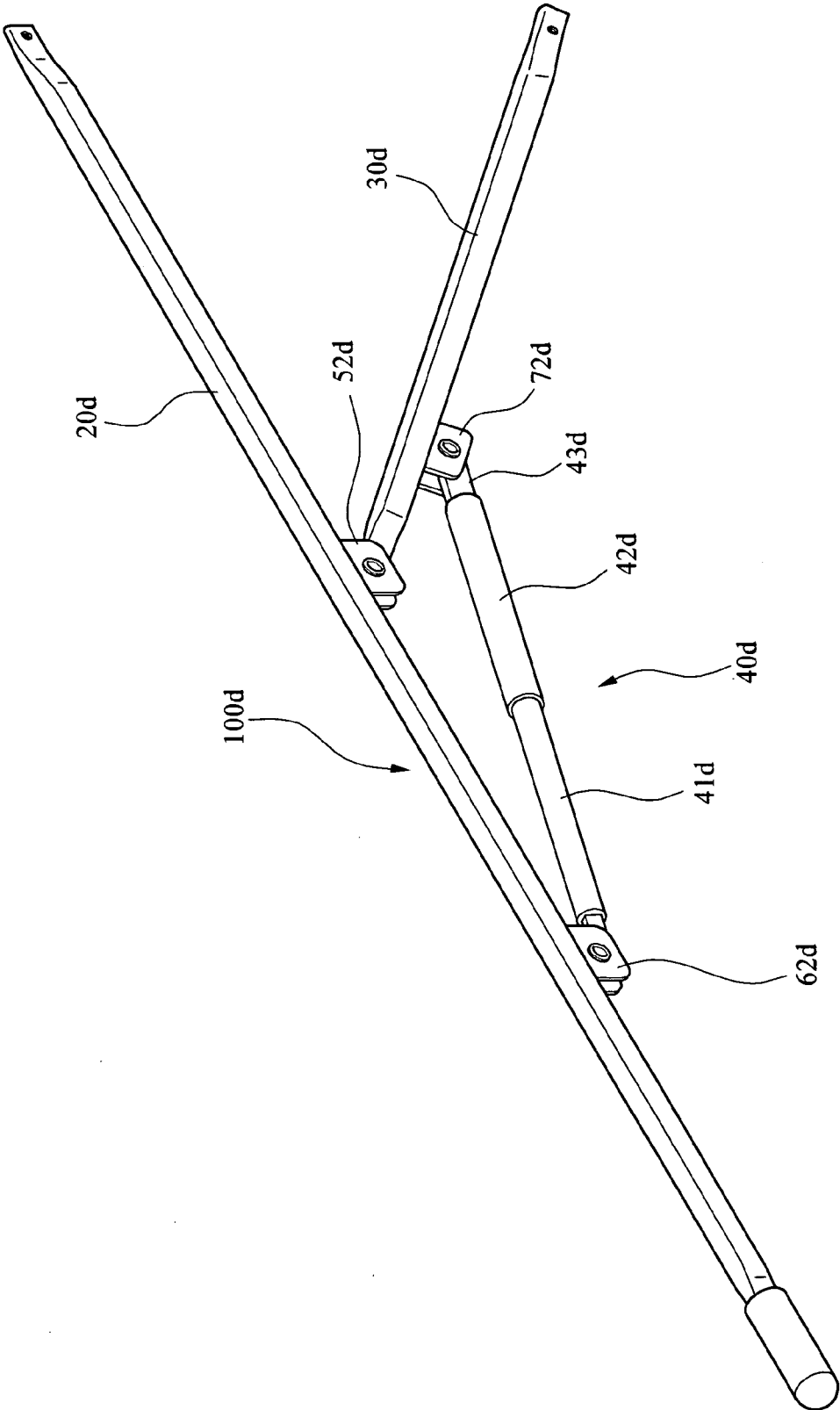


FIG.19

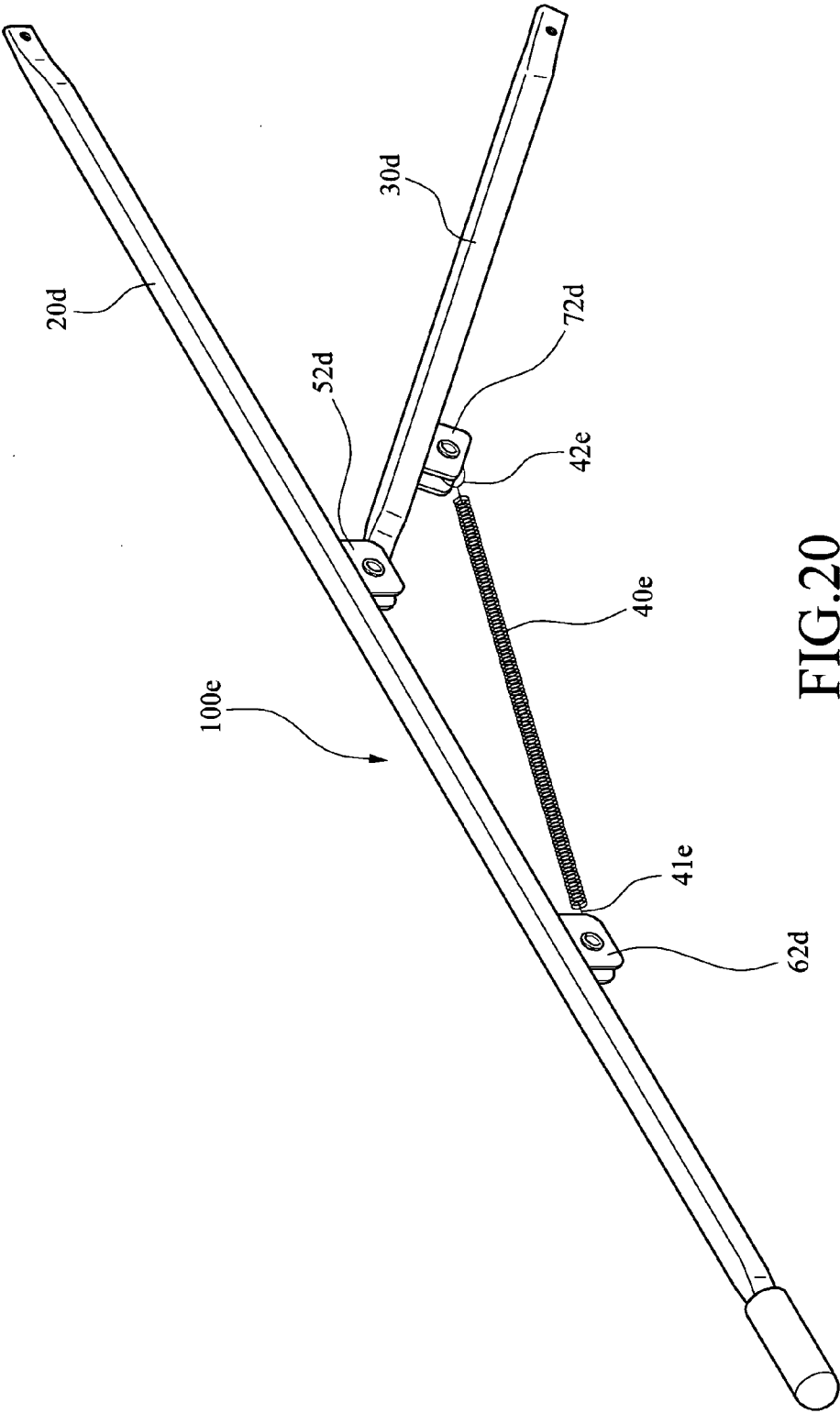


FIG. 20

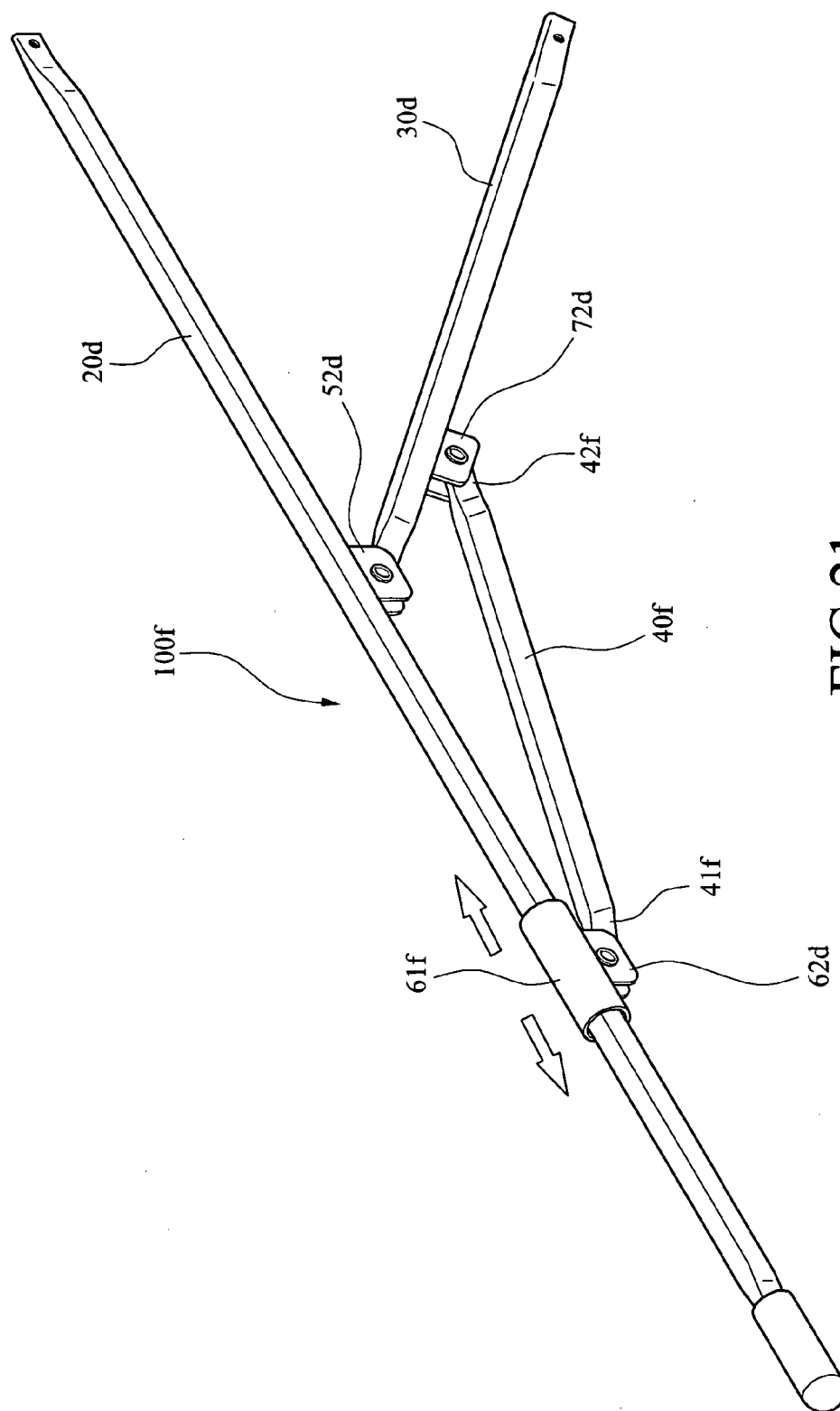


FIG. 21

WINDPROOF UMBRELLA

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The invention relates to umbrellas and more particularly to a windproof umbrella with improved characteristics.

[0003] 2. Description of Related Art

[0004] Conventionally, umbrellas are classified as symmetrical ones having a circular canopy with a shank extending downward from a center of the canopy and non-symmetrical ones having a non-circular canopy with a shank extending downward from a non-central position of the canopy as shown in FIG. 1. As shown in FIG. 2, canopy area to the left of the shank has a length S and canopy area to the right of the shank has a length L greater than length S.

[0005] Typical symmetrical umbrellas are not capable of withstanding strong wind which exerts a force against the inner surface of canopy. Thus, it is often that the canopy inverts from its normal operable position to an outwardly convex or bowed position. For typical non-symmetrical umbrellas, they even provide little resistance to inversion due to high wind. Typically, a person may hold a non-symmetrical umbrella obliquely with canopy area having a shorter length S in the front when high wind is blowing (i.e., exerts a force against the inner surface of canopy area having a greater length L) and heavy rain is falling in an angle with respect to the person. However, this umbrella holding manner has the danger of blocking view while walking as shown in FIG. 3. When heavy rain is falling in an angle with respect to the person holding umbrella, rain may hit the lower body as shown in FIG. 4. This is not desirable.

[0006] There have been numerous suggestions in prior patents for windproof umbrella. For example, U.S. Pat. No. 6,715,504 discloses a stick umbrella with reinforced frame. The windproof umbrella comprises a number of sets of rib A and rib B being alternate therewith. For rib A, a cord 32 is provided between a middle position of a stretcher and an outer position of main ribs 2. For rib B, a movable joint 31 is provided at an outer end of stretcher 3 to be positioned on the main ribs 2 between two fixed rings 21. When upward wind occurs, ribs A are held tight by the cords 32 and ribs B move upward or downward as the movable joints 31 move between the fixed rings 21 to escape the strong wind. As a result, an inversion of the umbrella is avoided.

[0007] However, in fact when upward wind occurs suddenly, ribs A are held tight by the cords 32 and ribs B do not move upward or downward as ribs B and ribs A are held firmly together with overall extended canopy and further, the movable joints 31 move between a small gap range of the fixed rings 21. Hence, its claimed advantage of escaping strong wind is not obtained.

[0008] Thus, it is desirable to provide a novel windproof umbrella in order to overcome the inadequacies of the prior art.

SUMMARY OF THE INVENTION

[0009] It is therefore one object of the invention to provide a improved windproof umbrella comprising a shank; a runner on the shank; a plurality of ribs; a canopy; a plurality of stretchers; a plurality of U-shaped first joints each secured onto the rib; a plurality of U-shaped second joints each slidably put on the rib; a plurality of U-shaped third joints each secured onto the stretcher; a plurality of auxiliary rods; and a

plurality of sets of first, second, and third pivotal members. The first pivotal member is formed at the other end of the stretcher and is pivotably connected to the first joint. The second pivotal member is formed at one end of the auxiliary rod and is pivotably connected to the second joint. The third pivotal member is formed at the other end of the auxiliary rod and is pivotably connected to the third joint. In response to strong wind, the second joint slides to change an angle between the rib and the stretcher at the first joint with the frame being flexibly deformed. By utilizing the invention, the following advantages including sufficient wind escape and durability can be obtained.

[0010] It is another object of the invention to provide a non-symmetrical windproof umbrella. Advantageously, view is not blocked and rain is prevented from falling on a person when the umbrella is held by the person with heavy rain falling. This is because the person is substantially under a center of the umbrella. Moreover, the umbrella holding is stable since wind force exerted on the umbrella is substantially uniform with respect to canopy area to the left of the shank having a first length and canopy area to the right of the shank having a second length. The umbrella holding is stable since force exerted on the umbrella is substantially uniform. It is still another object of the invention to provide a improved windproof umbrella having the advantage of being capable of smoothly closing the umbrella due to pivotal capability of the pivotal members and sliding capability of the joint.

[0011] The above and other objects, features and advantages of the invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a top plan view of a conventional non-symmetrical umbrella;

[0013] FIG. 2 is a side elevation of the umbrella of FIG. 1;

[0014] FIG. 3 is a side elevation of the umbrella of FIG. 1 being held obliquely when high wind is blowing and heavy rain is falling in an angle with respect to the person;

[0015] FIG. 4 is a side elevation of the umbrella of FIG. 1 being held obliquely when heavy rain is falling in an angle with respect to the person;

[0016] FIG. 5 is a perspective view of a portion of frame of a first preferred embodiment of windproof umbrella according to the invention in an open condition;

[0017] FIG. 6 is an exploded view of the windproof umbrella of FIG. 5;

[0018] FIG. 7 is a side elevation of the frame and shank of the windproof umbrella of FIG. 5;

[0019] FIG. 8 is a view similar to FIG. 7 when wind is blowing;

[0020] FIG. 9 is a view similar to FIG. 8 when high wind is blowing;

[0021] FIG. 10 is a side elevation of the windproof umbrella of FIG. 5 being held by a person when high wind is blowing;

[0022] FIG. 11 is a side elevation of the frame of FIG. 5 in a closed condition;

[0023] FIG. 12 is a perspective view of a non-symmetrical windproof umbrella having a frame constructed according to the first preferred embodiment of the invention;

[0024] FIG. 13 is a top plan view of the windproof umbrella of FIG. 12;

[0025] FIG. 13A is a top plan view of a symmetrical windproof umbrella having a frame constructed according to the first preferred embodiment of the invention;

[0026] FIG. 14 is a side elevation of the non-symmetrical, windproof umbrella of FIG. 12 in an open condition;

[0027] FIG. 15 is a side elevation of the non-symmetrical windproof umbrella of FIG. 12 being held by a person when heavy rain is falling;

[0028] FIG. 16 is a perspective view of a second preferred embodiment of windproof umbrella according to the invention in an open condition;

[0029] FIG. 17 is a perspective view of a portion of frame of a third preferred embodiment of windproof umbrella according to the invention in an open condition;

[0030] FIG. 18 is a perspective view of a portion of frame of a fourth preferred embodiment of windproof umbrella according to the invention in an open condition;

[0031] FIG. 19 is a perspective view of a portion of frame of a fifth preferred embodiment of windproof umbrella according to the invention in an open condition;

[0032] FIG. 20 is a perspective view of a portion of frame of a sixth preferred embodiment of windproof umbrella according to the invention in an open condition; and

[0033] FIG. 21 is a perspective view of a portion of frame of a seventh preferred embodiment of windproof umbrella according to the invention in an open condition.

DETAILED DESCRIPTION OF THE INVENTION

[0034] Referring to FIGS. 5 to 8, a windproof umbrella in accordance with a first preferred embodiment of the invention comprises the following components as discussed in detail below.

[0035] Frame 100 of the windproof umbrella comprises a central shank 10, a plurality of ribs 20, a plurality of stretchers 30, and a plurality of auxiliary rods 40. A canopy 101 is covered over the frame 100 (see FIG. 8).

[0036] The shank 10 comprises an upper hub 11 with the ribs 20 radially extending therefrom, and a spring biased runner 12 under the hub 11 with the stretchers 30 radially extending therefrom.

[0037] The rib 20 comprises, between its releasable first cup 21 at one end and a releasable second cup 22 at the other end, a first joint 51 proximate to the first cup 21 and a second joint 61 proximate to the second cup 22. The first cup 21 is pivotably connected to the hub 11. The first joint 51 comprises a U-shaped member 511, a first hollow member 512 extending from one end of the U-shaped member 511, and a second hollow member 513 extending from the other end of the U-shaped member 511. Likewise, the second joint 61 comprises a U-shaped member 611, a first hollow member 612 extending from one end of the U-shaped member 611, and a second hollow member 613 extending from the other end of the U-shaped member 611.

[0038] The rib 20 passes through the second hollow member 513, the first hollow member 512, the second hollow member 613, and the first hollow member 612 to have the other end fitted into the second cup 22. One end of the rib 20 is fitted into the first cup 21. The coupling of the rib 20 and both the second hollow member 513 and the first hollow member 612 is fixed, i.e., the first joint 51 is fixed. The second joint 61 is adapted to slide along the rib 20, i.e., sliding along both the second hollow member 613 and the first hollow member 612.

[0039] The stretcher 30 comprises a separate cup element 31 pivotably connected to the runner 12. One end of the stretcher 30 is fastened in the cup element 31. A third joint 71 comprises a U-shaped member 711, a first hollow member 712 extending from one end of the U-shaped member 711, and a second hollow member 713 extending from the other end of the U-shaped member 711. The stretcher 30 passes through the second hollow member 713 and the first hollow member 712 to have its other end fastened in one end of a first pivotal member 52.

[0040] The bifurcated first pivotal member 52 has a transverse bar 520 at the other end pivotably fitted in the U-shaped member 511 of the first joint 51. The auxiliary rod 40 has one end fastened in the other end of a third pivotal member 72 and the other end fastened in one end of a second pivotal member 62. The bifurcated third pivotal member 72 has a transverse bar 720 at one end pivotably fitted in the U-shaped member 711 of the third joint 71. The bifurcated second pivotal member 62 has a transverse bar 620 at the other end pivotably fitted in the U-shaped member 611 of the second joint 61. An angle θ is formed between the rib 20 and the stretcher 30 at the first joint 51 (see FIG. 7).

[0041] Referring to FIGS. 8 to 10, wind escaping operation of the invention will be described in detail below. In FIG. 8, strong wind exerts a force against the inner surface of the canopy 101. And in turn, the ribs 20 bend upward, i.e., slightly bowed. Most portion of the wind may flow toward the canopy 101 to escape. The angle may become θ_1 greater than θ of FIG. 7 as the first pivotal member 52 pivots about the first joint 51. Further, the third pivotal member 72 may also pivot about the stretcher 30 to decrease an angle of the auxiliary rod 40 with respect to the stretcher 30. And in turn, the second joint 61 slides along the rib 20 toward the first joint 51 as indicated by arrow above the second joint 61. The auxiliary rods 40 can provide additional support to the ribs 20 in order to withstand exerted force and thus prevent the ribs 20 and the canopy 101 from being inverted when high wind is blowing.

[0042] In FIG. 9, stronger wind exerts a force against the inner surface of the canopy 101. And in turn, the ribs 20 further bend upward. The angle may become θ_2 greater than θ_1 of FIG. 8 as the first pivotal member 52 pivots about the first joint 51.

[0043] It is contemplated by the invention that a triangle t is formed with the first joint 51 as the first vertex, the second joint 61 as the second vertex, and the third joint 71 as the third vertex. Also, the triangle t may change three angles thereof in response to wind strength. In short, angle θ may become greater θ_1 as wind strength increases and angle θ_1 may further become even greater θ_2 as wind strength further increases. This has the benefit of reducing force exerted upon the frame 100 (particularly the ribs 20). Also, the auxiliary rods 40 can share force exerted upon the ribs 20. The ribs 20 and thus windproof umbrella 1 may flexibly deform when high wind is blowing (see FIG. 10). This is because of the umbrella 1 being done by the way of the smoothly and simultaneously co-related pivotal motions among the bifurcated first pivotal member 52, the bifurcated second pivotal member 62 and the bifurcated third pivotal member 72 with respect to U-shaped members 511, 611, and 711, respectively. Therefore, the wind escape capability of windproof umbrella 1 of the invention is greatly increased.

[0044] Referring to FIG. 11, a person may pull down the runner 12 of FIG. 7, the stretchers 30 then pivot toward the ribs 20, the auxiliary rods 40 also pivot toward the ribs 20, the

second joints **61** slide toward the second cups **22**, and finally the second joints **61** are stopped by the second cups **22**. This finishes the smoothly closing of the umbrella **1** due to the reason as mentioned in above paragraph. The concave portions (i.e., U-shaped members **511**, **611**, and **711**) of the first joint **51**, the second joint **61**, and the third joint **71** provide a sufficient space for the first pivotal member **52**, the second pivotal member **62**, and the third pivotal member **72** to pivot therein respectively. That is, almost 180 degrees pivotal angle. It is seen that the stretcher **30**, the auxiliary rod **40**, and the rib **20** almost parallel each other when the umbrella **1** is completely closed, as shown in FIG. **11**.

[0045] Referring to FIGS. **12** and **13**, length of the ribs **20a** are not the same with an irregular shaped canopy **101a** covered thereon.

[0046] Referring to FIG. **13A**, length of the ribs **20b** are the same with a regular shaped canopy **101b** covered thereon.

[0047] Referring to FIG. **14** in conjunction with FIGS. **12** and **13** again, top of the shank **10** is secured to a center of the canopy **101a** (see FIGS. **12** and **13**) or a center of the canopy **101b** (see FIG. **13A**). As shown in FIG. **14**, canopy area to the left of the shank **10** has a left part **D1** and canopy area to the right of the shank **10** has a right part **D2** greater than length **D1**. The areas against the wind of the part **D1**, **D2** are average make easy to stably hold the shank **10** of the umbrella **1**.

[0048] Referring to FIG. **15** in conjunction with FIG. **14**, it shows the non-symmetrical windproof umbrella **1** of the invention being held by a person when heavy rain is falling. Advantageously, view is not blocked by the umbrella **1**, the person is substantially under a center of the umbrella **1** to prevent the rain from falling thereon, and the umbrella holding is stable since force exerted on the umbrella **1** is substantially uniform with respect to canopy area to the left of the shank **10** having a length **D1** and canopy area to the right of the shank **10** having a length **D2**.

[0049] Referring to FIG. **16**, a second preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The characteristics of the second preferred embodiment are detailed below. The ribs **20** of the frame **100a** are comprised of a number of sets of rib **A** and a number of sets of rib **B** being alternate therewith. The sets of rib **A** are constructed the same as that described with respect to the first preferred embodiment. The sets of rib **B** are constructed different from that described with respect to the first preferred embodiment by eliminating the auxiliary rods **40**. That is, the sets of rib **B** are constructed the same as the frame of conventional umbrella. The advantages of the second preferred embodiment are substantially the same as the first preferred embodiment.

[0050] Referring to FIG. **17**, a third preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The characteristics of the frame **100b** of the third preferred embodiment are detailed below. The second joint **61b** is fixed. The auxiliary rod **40b** is telescopic and comprises an inner tube **41b** having one end fixedly connected to the second pivotal member **62**, and an outer tube **42b** slidably put on the inner tube **41b** as indicated by two opposite arrows, the outer tube **42b** having a reduced diameter end **43b** fixedly connected to the third pivotal member **72**. The advantages of the third preferred embodiment are substantially the same as the first preferred embodiment.

[0051] Referring to FIG. **18**, a fourth preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The characteristics of the frame **100c** of

the fourth preferred embodiment are detailed below. The auxiliary rod is replaced by a torsion spring **40c** having one end **41c** anchored at a hole **62c** formed at a second joint **61b** and the other end **42c** anchored at a hole **72c** formed at a third joint **71**. The advantages of the fourth preferred embodiment are substantially the same as the first preferred embodiment.

[0052] It is noted that the frames **100**, **100a**, **100b**, and **100c** are made of FRP (fiber reinforced plastic) and the joints and the pivotal members are made of plastic in the first, second, third, and fourth preferred embodiments.

[0053] Referring to FIG. **19**, a fifth preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The fifth preferred embodiment is a modification of the third preferred embodiment. The characteristics of the frame **100d** of the third preferred embodiment are detailed below. The U-shaped first joint is replaced by a bifurcated first joint **52d**. The U-shaped second joint is replaced by a bifurcated second joint **62d**. The U-shaped third joint is replaced by a bifurcated third joint **72d**. The telescopic auxiliary rod **40d** comprises an inner tube **41d** having one end pivotably connected to the second joint **62**, and an outer tube **42d** slidably put on the inner tube **41d**, the outer tube **42d** having a reduced diameter end **43b** pivotably connected to the third joint **72**. The first joint is replaced by a bifurcated first joint **52d** with one end of a shank **30d** pivotably connected thereto. The advantages of the fifth preferred embodiment are substantially the same as the first preferred embodiment.

[0054] Referring to FIG. **20**, a sixth preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The sixth preferred embodiment is a modification of the fourth preferred embodiment. The characteristics of the frame **100d** of the sixth preferred embodiment are detailed below. A torsion spring **40e** has one end **41e** anchored at a bifurcated second joint **62d** and the other end **42e** anchored at a bifurcated third joint **72d**. The first joint is replaced by a bifurcated first joint **52d** with one end of a shank **30d** pivotably connected thereto. The advantages of the sixth preferred embodiment are substantially the same as the first preferred embodiment.

[0055] Referring to FIG. **21**, a seventh preferred embodiment of windproof umbrella according to the invention in an open condition is shown. The seventh preferred embodiment is a modification of the fifth preferred embodiment. The characteristics of the frame **100f** of the seventh preferred embodiment are detailed below. The telescopic auxiliary rod is replaced by a fixed auxiliary rod **40f**. The second joint is replaced by a sliding tube **61f** put on the rib **20d**. That is, the sliding tube **61f** can slide with respect to the rib **20d** as indicated by two opposite arrows. One end **41f** of the fixed auxiliary rod **40f** is pivotably connected to a second bifurcated joint **62d** formed on a bottom of the sliding tube **61f** and the other end thereof is pivotably connected to a third bifurcated joint **72d** formed on a stretcher **30d**. The stretcher **30d** has one end pivotably connected to a first bifurcated joint **52d** formed on the rib **20d**. The advantages of the seventh preferred embodiment are substantially the same as the first preferred embodiment.

[0056] Preferably, each of the rib **20d**, the stretcher **30d**, and the auxiliary rod **40f** has a section of U and is formed of iron plate.

[0057] While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those

skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A windproof umbrella comprising:
 - a shank (10) having an upper hub (11) and a lower runner (12) slidably put on the shank (10);
 - a plurality of ribs (20) extending outwardly in a radial direction from the hub (11);
 - a canopy (101) secured in covering relation on the ribs (20);
 - a plurality of stretchers (30) having one end pivotably connected to the runner (12);
 - a plurality of first joints (51) each secured onto the rib (20) and being proximate to the hub (11), the first joint (51) comprising a U-shaped member (511);
 - a plurality of second joints (61) each slidably put on the rib (20) and being distal from the hub (11), the second joint (61) comprising a U-shaped member (611);
 - a plurality of third joints (71) each secured onto the stretcher (30) and comprising a U-shaped member (711);
 - a plurality of auxiliary rods (40); and
 - a plurality of sets of first, second, and third pivotal members (52, 62, and 72),
 wherein the first pivotal member (52) of each set is formed at the other end of the stretcher (30) and is pivotably connected to the U-shaped member (511) of the first joint (51);
 - wherein the second pivotal member (62) of each set is formed at one end of the auxiliary rod (40) and is pivotably connected to the U-shaped member (611) of the second joint (61); and
 - wherein the third pivotal member (72) of each set is formed at the other end of the auxiliary rod (40) and is pivotably connected to the U-shaped member (711) of the third joint (71).
2. The windproof umbrella of claim 1, wherein the first joint (51) further comprises a first hollow member (512) extending from one end of the U-shaped member (511), and a second hollow member (513) extending from the other end of the U-shaped member (511); the second joint (61) further comprises a first hollow member (612) extending from one end of the U-shaped member (611), and a second hollow member (613) extending from the other end of the U-shaped member (611); the rib (20) fixedly passes through the second hollow member (513) and the first hollow member (512); and the rib (20) passes through the second hollow member (613) and the first hollow member (612) with both the first and second hollow members (612, 613) being slidable thereon.
3. The windproof umbrella of claim 1, wherein the third joint (71) further comprises a first hollow member (712) extending from one end of the U-shaped member (711), and a second hollow member (713) extending from the other end of the U-shaped member (711); and the stretcher (30) fixedly passes through the second hollow member (713) and the first hollow member (712).
4. The windproof umbrella of claim 1, wherein lengths of the ribs (20) are the same.
5. The windproof umbrella of claim 1, wherein lengths of the ribs (20) are different.
6. The windproof umbrella of claim 1, wherein a triangle (t) is formed with the first joint (51) as the first vertex, the second joint (61) as the second vertex, and the third joint (71) as the third vertex, the triangle (t) may change three angles thereof

in response to wind, the second joint (61) slides to change an angle (θ) between the rib (20) and the stretcher (30) at the first joint (51).

7. A windproof umbrella comprising:
 - a shank (10) having an upper hub (11) and a lower runner (12) slidably put on the shank (10);
 - a plurality of ribs (20) extending outwardly in a radial direction from the hub (11);
 - a canopy (101) secured in covering relation on the ribs (20);
 - a plurality of stretchers (30) having one end pivotably connected to the runner (12);
 - a plurality of first joints (51) each secured onto the rib (20) and being proximate to the hub (11), the first joint (51) comprising a U-shaped member (511);
 - a plurality of second joints (61b) each secured onto the rib (20) and being distal from the hub (11), the second joint (61b) comprising a U-shaped member (611);
 - a plurality of third joints (71) each secured onto the stretcher (30) and comprising a U-shaped member (711);
 - a plurality of extensible auxiliary members (40); and
 - a plurality of sets of first, second, and third pivotal members (52, 62, and 72),
 wherein the first pivotal member (52) of each set is formed at the other end of the stretcher (30) and is pivotably connected to the U-shaped member (511) of the first joint (51);
 - wherein the second pivotal member (62) of each set is formed at one end of the auxiliary member (40) and is pivotably connected to the U-shaped member (611) of the second joint (61b); and
 - wherein the third pivotal member (72) of each set is formed at the other end of the auxiliary member (40) and is pivotably connected to the U-shaped member (711) of the third joint (71).
8. The windproof umbrella of claim 7, wherein the auxiliary member (40) is a telescopic member (40b) comprising an inner tube (41b) having one end fixedly connected to the second pivotal member (62), and an outer tube (42b) slidably put on the inner tube (41b), the outer tube (42b) having a reduced diameter end (43b) fixedly connected to the third pivotal member (72).
9. The windproof umbrella of claim 7, wherein the auxiliary member (40) is an elastic member (40c) having one end (41c) anchored at a hole (62c) formed at the second joint (61b) and the other end (42c) anchored at a hole (72c) formed at the third joint (71).
10. The windproof umbrella of claim 7, wherein lengths of the ribs (20) are the same.
11. The windproof umbrella of claim 7, wherein lengths of the ribs (20) are different.
12. The windproof umbrella of claim 7, wherein a triangle (t) is formed with the first joint (51) as the first vertex, the second joint (61b) as the second vertex, and the third joint (71) as the third vertex, the triangle (t) may change three angles thereof in response to wind, the second joint (61b) slides to change an angle (θ) between the rib (20) and the stretcher (30) at the first joint (51).
13. A windproof umbrella comprising:
 - a shank (10) having an upper hub (11) and a lower runner (12) slidably put on the shank (10);
 - a plurality of ribs (20d) extending outwardly in a radial direction from the hub (11);

a canopy (101) secured in covering relation on the ribs (20d);
a plurality of bifurcated first joints (52d) each secured onto the rib (20d) and being proximate to the hub (11);
a plurality of stretchers (30d) having one end pivotably connected to the runner (12) and the other end pivotably connected to the first joint (52d);
a plurality of sliding tubes (61f) each slidably put on the rib (20d) and being distal from the hub (11);
a plurality of bifurcated second joints (62d) each formed on the sliding tube (61f);
a plurality of bifurcated third joints (72d) each secured onto the stretcher (30d); and
a plurality of auxiliary rods (40f) having one end (41f) pivotably connected to the second bifurcated joint (62d) and the other end pivotably connected to the third joint (72d).

14. The windproof umbrella of claim 13, wherein each of the rib (20d), the stretcher (30d), and the auxiliary rod (40f) has a section of U and is formed of iron plate.

15. The windproof umbrella of claim 13, wherein lengths of the ribs (20) are the same.

16. The windproof umbrella of claim 13, wherein lengths of the ribs (20) are different.

17. The windproof umbrella of claim 13, wherein a triangle (t) is formed with the first joint (52d) as the first vertex, the second joint (62d) as the second vertex, and the third joint (72d) as the third vertex, the triangle (t) may change three angles thereof in response to wind, the second joint (62d) slides to change an angle (θ) between the rib (20d) and the stretcher (30d) at the first joint (52d).

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