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(71) Applicant: **Wang, Max**
Tai-Ping City,
Taichung Hsien (TW)

(72) Inventor: **Wang, Max**
Tai-Ping City,
Taichung Hsien (TW)

(74) Representative: **Hague, Alison Jane**
Frank B. Dehn & Co.
St Bride's House
10 Salisbury Square
London EC4Y 8JD (GB)

(54) Foldable umbrella frame

(57) A foldable umbrella frame includes a plurality of ribs (3) eachhaving a foldable portion that includes twopivoted segments (331,332) which extend along a centerline to terminate at two grip ends (333,334), and a reinforcing member (5) which has two gripped ends (515,516,525,526) firmly gripped in the grip ends (333,334) by virtue of malleating the grip ends (333,334), and an intermediate portion (517,527) that extends along the centerline and that has first and second surfaces (513,523,511,521) opposite to each other in the upright direction. The first surface (513,523) has a ridge region (514,524) which extends in the upright direction and along the centerline and which is formed by pressing the second surface (511,521) towards the first surface (513,523) and along the centerline so as to strengthen the structure of the ribs (3).

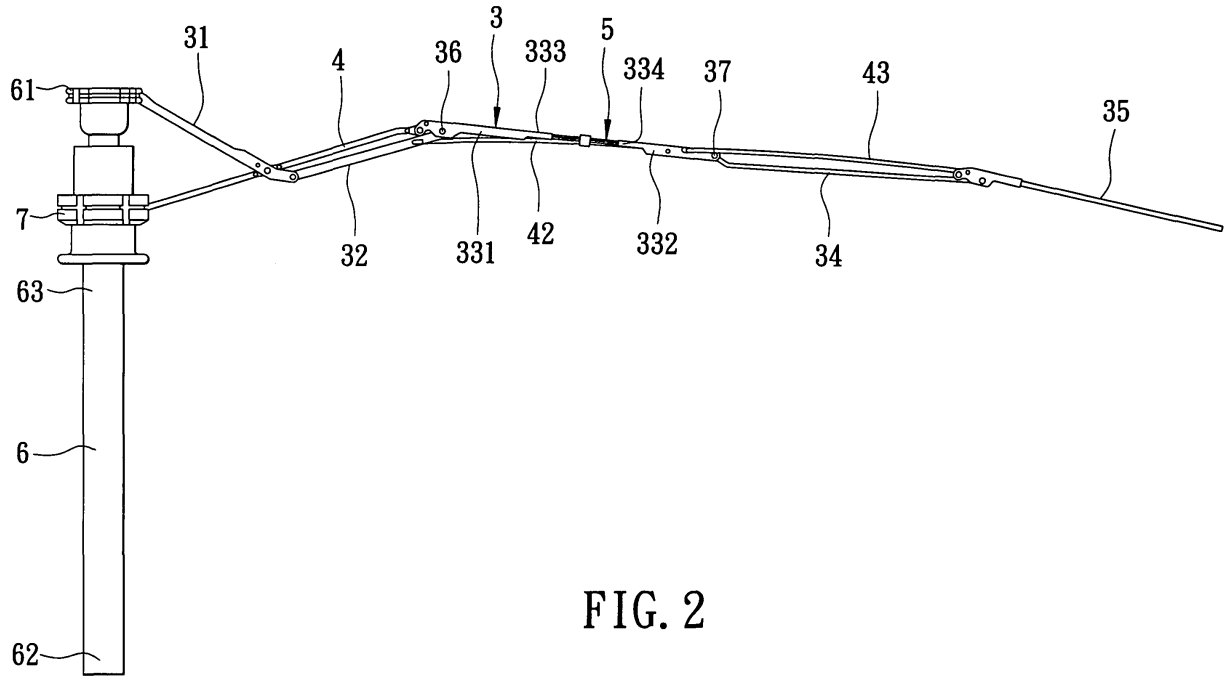

FIG. 2

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Description

[0001] This invention relates to a foldable umbrella frame, more particularly to a foldable umbrella frame with a plurality of reinforcing ribs to protect the same against bending and deformation.

[0002] Referring to Fig. 1, a conventional foldable umbrella frame is shown to include an elongate stem 10, a plurality of rib assemblies 1 each of which includes a proximate portion 11, a first strut 13, a second strut 14 and a distal portion 15 pivotally connected to one another, a plurality of linkage members 16 connected to the rib assemblies 1 to facilitate stretching and retracting of the rib assemblies, and a plurality of stretchers 12, each of which interconnects a runner 17 and the proximate portion 11 of the respective rib assembly 1 to stretch and retract the rib assembly 1 when the runner 17 is moved along the stem 10.

[0003] Most parts of the rib assemblies 1 and the stretchers 12 are generally made from an aluminum alloy material, and have a U-shaped cross-section so as to render the umbrella frame light-weighted. To increase the strength of the rib assemblies 1, the first strut 13 includes a reinforcing portion 133 which is gripped by two malleated grip ends 131, 132. However, such a construction does not have a sufficient strength so that the bending and deformation of the rib assemblies 1 are likely to occur.

[0004] The object of the present invention is to provide a foldable umbrella frame which has reinforced ribs for effectively supporting an umbrella canopy and achieving an enhanced windproof effect.

[0005] According to this invention, the foldable umbrella frame includes an elongate stem extending along an axis in an upright direction, and having an upper end, a lower end, and a middle portion therebetween. A plurality of ribs are displaced angularly from one another about the axis. Each of the ribs includes a first proximate portion pivotally mounted on the upper end of the stem, a first distal portion opposite to the first proximate portion in a radial direction relative to the axis, and a foldable portion interposed between the first proximate and distal portions. A runner is sleeved on and is slidable along the middle portion of the stem. A plurality of stretchers are displaced angularly from one another about the axis. Each of the stretchers includes a second proximate portion and a second distal portion pivotally mounted on the runner and the foldable portion, respectively, to stretch or retract a respective one of the ribs when the runner is moved along the middle portion of the stem.

[0006] The foldable portion of each of the ribs includes two pivoted segments which extend along a centerline in the radial direction to terminate at two grip ends that are spaced apart from each other, and which extend respectively from first and second pivoted junctures towards each other, the first and second pivoted junctures being proximate to the first proximate and distal portions, respectively, and a reinforcing member including a first half unit which has two gripped ends that are opposite to each other along the centerline, and that are firmly gripped in the grip ends by virtue of malleating the grip ends, and an intermediate portion that extends along the centerline and that has first and second surfaces opposite to each other in the upright direction. The first surface has a ridge region which extends in the upright direction and along the centerline and which is formed by pressing the second surface towards the first surface and along the centerline.

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

Fig. 1 is a partial schematic view of a conventional foldable umbrella frame in a stretched state;
Fig. 2 is a partial schematic view of the preferred embodiment of a foldable umbrella frame according to this invention when stretched;
Fig. 3 is an enlarged view of a reinforcing member of a rib of the preferred embodiment; and
Fig. 4 is a partly cross-sectional view of the reinforcing member taken along lines 4-4 of Fig. 3.

[0008] Referring to Fig. 2, the preferred embodiment of a foldable umbrella frame according to the present invention is shown to comprise an elongate stem 6 extending along an axis in an upright direction, and having an upper end 61, a lower end 62, and a middle portion 63 therebetween, a runner 7 sleeved on and slidable along the middle portion 63 of the stem 6, a plurality of ribs 3 displaced angularly from one another about the axis, and a plurality of stretchers 4 displaced angularly from one another about the axis.

[0009] Each of the ribs 3 includes a first proximate portion 31 pivotally mounted on the upper end 61 of the stem 6, a first distal portion 35 opposite to the first proximate portion 31 in a radial direction relative to the axis, and a foldable portion interposed between the first proximate and distal portions 31, 35. The foldable portion includes a first strut 32 which is pivotally connected to the first proximate portion 31, a second strut 34 which is pivotally connected to the first distal portion 35, two pivoted segments 331, 332 which are pivotally connected to the first and second struts 32, 34 at first and second pivoted junctures 36, 37, respectively, and a reinforcing member 5. The pivoted segments 331, 332 extend respectively from the first and second pivoted junctures 36, 37 towards each other, and along a centerline in the radial direction to terminate at two grip ends 333, 334 which are spaced apart from each other. Each of the first proximate portion 31, the first strut 32, and the pivoted segments 331, 332 has a U-shaped cross-section, and is made from an aluminum alloy material so as to render the rib 3 relatively light-weighted.

[0010] Each of the stretchers 4 includes a second proximate portion and a second distal portion pivotally mount-

ed on the runner 7 and the pivoted segment 331 of the foldable portion, respectively, to stretch or retract the respective rib 3 when the runner 7 is moved along the middle portion 63 of the stem 6. A first linkage member 42 is connected between the first strut 32 and the pivoted segment 332, and a second linkage member 43 is connected between the pivoted segment 332 and the first distal portion 35 so as to facilitate stretching and retracting of the respective rib 3.

[0011] With reference to Figs. 3 and 4, the reinforcing member 5 includes first and second half units 51, 52 of the same construction, and made from a rigid metal material. Each of the first and second half units 51, 52 has two gripped ends 515, 516 and 525, 526 which are opposite to each other along the centerline and which are firmly gripped in the grip ends 333, 334 by virtue of malleating the grip ends 333, 334, and an intermediate portion 517, 527 which extends along the centerline and which has first and second surfaces 513, 511 and 523,521 opposite to each other in the upright direction. The first surface 513, 523 has a ridge region 514, 524 which extends in the upright direction and along the centerline and which is formed by pressing the second surface 511, 521 towards the first surface 513, 523 and along the centerline. In assembly, the second surface 521 of the second half unit 52 is bonded to the second surface 511 of the first half unit 51 to define a bonding plane such that the first and second half units 51, 52 are in symmetry relative to the bonding plane.

[0012] As illustrated, due to the provision of the ridge regions 514, 524, the structure of the reinforcing member 5 is strengthened so as to increase the windproof effect of the umbrella frame and to effectively support an umbrella canopy (not shown).

Claims

1. A foldable umbrella frame comprising:

an elongate stem (6) extending along an axis in an upright direction, and having an upper end (61), a lower end (62), and a middle portion (63) therebetween;

a plurality of ribs (3) displaced angularly from one another about the axis, each of said ribs (3) including a first proximate portion (31) pivotally mounted on said upper end (61) of said stem (6), a first distal portion (35) opposite to said first proximate portion (31) in a radial direction relative to the axis, and a foldable portion interposed between said first proximate and distal portions (31,35);

a runner (7) sleeved on and slidable along said middle portion (63) of said stem (6); and

a plurality of stretchers (4) displaced angularly from one another about the axis, each of said stretchers (4) including a second proximate portion and a second distal portion pivotally mounted on said runner (7) and said foldable portion, respectively, to stretch or retract a respective one of said ribs (3) when said runner (7) is moved along said middle portion (63) of said stem (6), **characterized in that**:

said foldable portion of each of said ribs (3) including

two pivoted segments (331,332) which extend along a centerline in the radial direction to terminate at

two grip ends (333,334) that are spaced apart from each other, and which extend respectively from first and second pivoted junctures (36,37) towards each other, said first and second pivoted junctures (36, 37) being proximate to said first proximate and distal portions (31,35), respectively, and

a reinforcing member (5) including a first half unit (51) which has two gripped ends (515,516) that are opposite to each other along the centerline, and that are firmly gripped in said grip ends (515,516) by virtue of malleating said grip ends (515,516), and an intermediate portion (517) that extends along the centerline and that has first and second surfaces (513,511) opposite to each other in the upright direction, said first surface (513) having a ridge region (514) which extends in the upright direction and along the centerline and which is formed by pressing said second surface (511) towards said first surface (513) and along the centerline.

2. The foldable umbrella frame of Claim 1, **characterized in that** each of said pivoted segments (331,332) has a U-shaped cross-section, and is made from an aluminum alloy material, said reinforcing member (5) being made from a rigid metal material.

3. The foldable umbrella frame of Claim 1 or 2, **characterized in that** said reinforcing member (5) further includes a second half unit (52) which has the same construction as that of said first half unit (51), said second half unit (52) having a second surface (521) bonded to said second surface (511) of said first half unit (51) to define a bonding plane such that said first and second half units (51,52) are in symmetry relative to the bonding plane.

4. The foldable umbrella frame of Claim 1, 2 or 3, **characterized in that** said foldable portion of each of said ribs (3) includes a first strut (32) pivotally mounted to said first proximate portion (31) and one of said pivoted segments (331) at said first pivoted juncture

(36), and a second strut (34) pivotally mounted to said first distal portion (35) and the other one of said pivoted segments (332) at said second pivoted juncture (37).

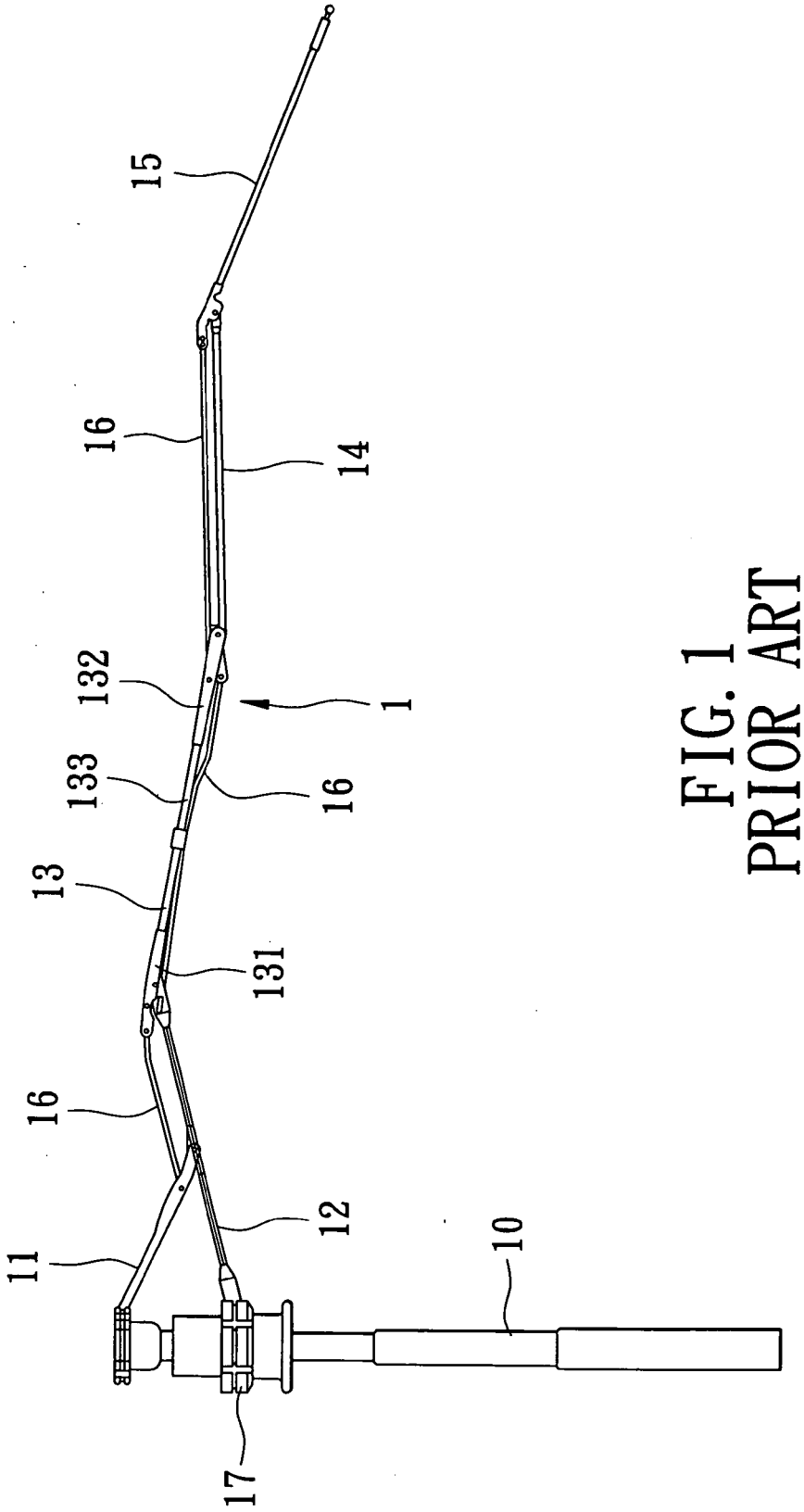

FIG. 1
PRIOR ART

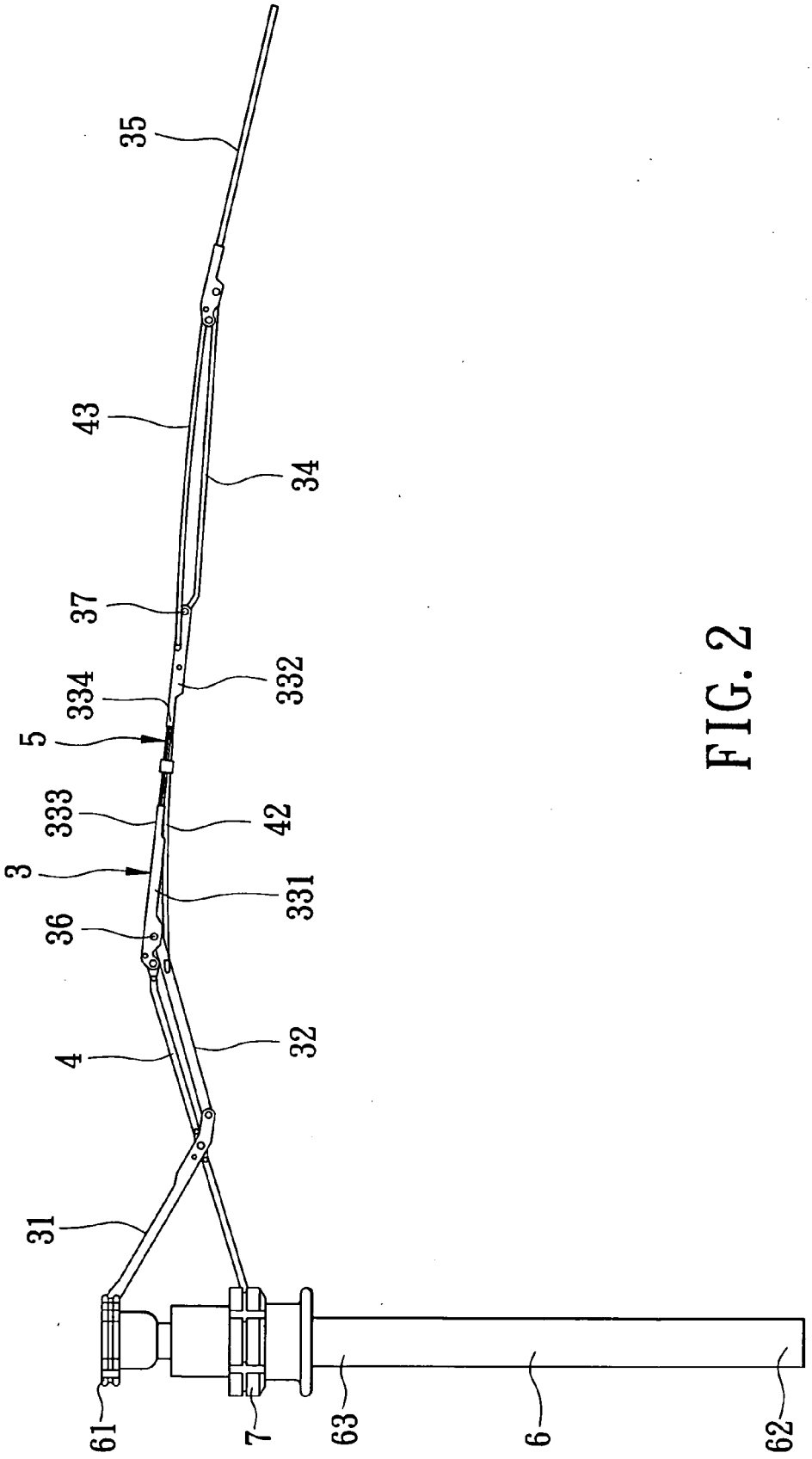

FIG. 2

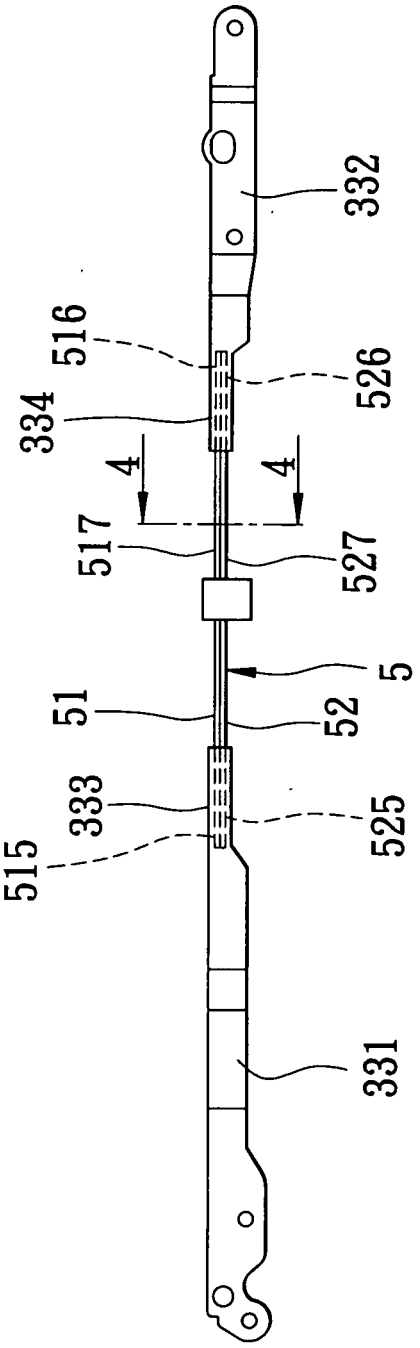

FIG. 3

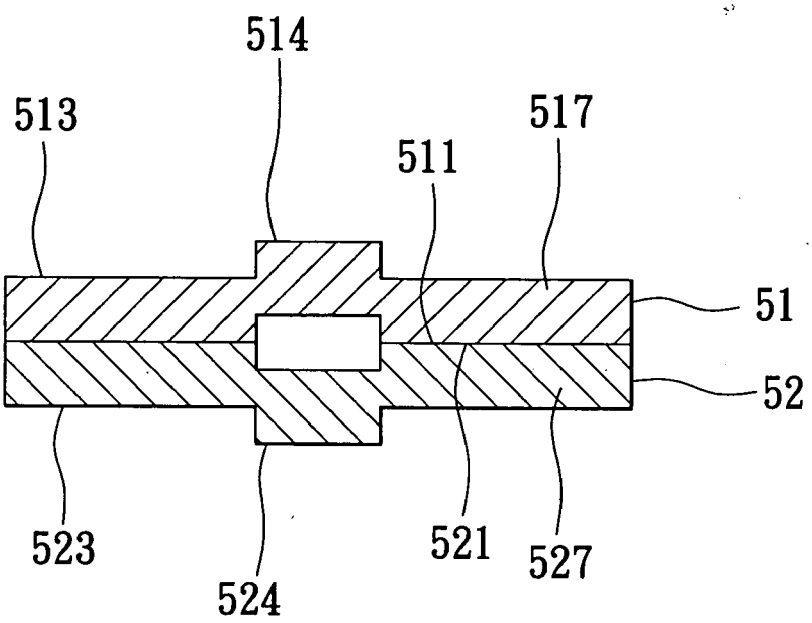

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 25 1780

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	US 2004/123888 A1 (LIU FU-TIEN ET AL) 1 July 2004 (2004-07-01) * abstract * * paragraphs [0019], [0020] * * figures 1,3-5 *	1,2,4 3	INV. A45B25/02
Y	US 943 068 A (A.FRIEDLAENDER) 14 December 1909 (1909-12-14) * the whole document *	1,2,4	
A	US 5 842 493 A (YAKUBISIN ET AL) 1 December 1998 (1998-12-01) * the whole document *	1-4	
A	US 6 497 242 B1 (LIN CHUNG-KUANG ET AL) 24 December 2002 (2002-12-24) * figures 2-5 * * column 3, line 62 - column 4, line 6 *	2	
A	US 5 063 953 A (WU ET AL) 12 November 1991 (1991-11-12) * column 1, line 65 - column 3, line 5 * * figures 1-3,6,7,12 *	1-4	TECHNICAL FIELDS SEARCHED (IPC) A45B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 September 2006	Witkowska-Piela, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 25 1780

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82