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• **Chen, Chun-Tsai**  
**Panchiao City**  
**Taipei Hsien (TW)**

(72) Inventors:  
• **Su, Shui-Chuan**  
**Tainan (TW)**  
• **Chen, Chun-Tsai**  
**Panchiao City**  
**Taipei Hsien (TW)**

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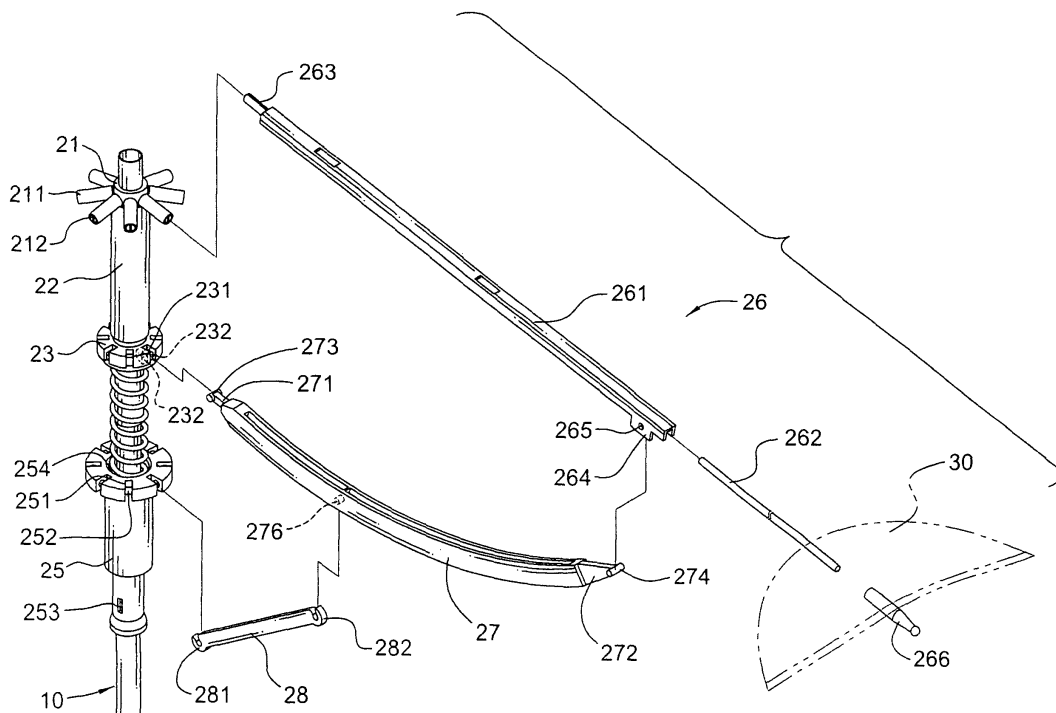
(71) Applicants:  
• **Su, Shui-Chuan**  
**Tainan (TW)**

(74) Representative: **Viering, Jentschura & Partner**  
**Steinsdorfstrasse 6**  
**80538 München (DE)**

(54) **Umbrella Skeleton**

(57) An umbrella skeleton has a major shaft (10) and an umbrella frame (20), and the umbrella frame (20) includes a connection member (21), a middle runner (23), a lower runner (25), a spring (24), a sleeve (22), multiple

ribs (26), multiple first stretchers (27) and second stretchers (28). Besides the normal function of the umbrella, the umbrella skeleton of this invention can be assembled by hand conveniently without any rivets and iron wires. Moreover, most elements can be made of plastic.



**FIG.1**

## Description

### 1. Field of the Invention

**[0001]** The present invention relates to an umbrella skeleton, and particularly relates to an umbrella skeleton that can be assembled by hand conveniently.

### 2. Description of Related Art

**[0002]** At present, the conventional umbrella has an umbrella skeleton and a water repellent fabric, as shown in Fig. 5; the umbrella skeleton comprises a major shaft (40) and an umbrella frame (50). A handle (not numbered) is formed at a lower end of the major shaft (40), and a button (not numbered) is provided above the handle. The umbrella frame (50) has an upper runner (51), a middle runner (52), a lower runner (53) mounted encircling the major shaft (10), and multiple ribs (54), first stretchers (55) and second stretchers (56). The ribs (54) are attached to the upper runner (51) by a steel wire (57). The middle runner (52) is mounted below the upper runner (51) and one end of each of the first stretchers (55) is attached to the middle runner (52) by a steel wire (57), and the other end of each of the stretchers (55) is pivotally connected to the ribs (51) by a rivet. With the water repellent fabric fitted to the skeleton, the umbrella is assembled to provide shelter from sunshine or rain. Coil springs (58) are mounted around the major shaft (40).

**[0003]** However, the conventional umbrella has some disadvantages

1. It is difficult to assemble: the ribs (54), the first stretchers (55), the second stretchers (56) are respectively fastened to the upper runner (51), the middle runner (52), and the lower runner (53) by the wires, and rivets are used for connecting the ribs (54), first and second stretchers (55,56), which is tedious and requires very nimble-fingered personnel.

2. Safety can not be ensured: distal ends of the iron wires are cut in manufacture which results in sharp tips that point outward, which is dangerous to the user.

3. Electroplating has pollution side effects: the iron wires require electroplating, which is toxic and causes environmental pollution.

4. Broken elements can not be replaced: once some elements of the umbrella are broken, it is virtually impossible for people to replace them without some special tools, and people normally throw away the whole umbrella, which is a waste of material.

5. Monotonous appearance of frame: For more than 100 years, umbrella frames have been either painted black or chromium plated steel. Ironically, despite huge variations in the appearance of the fabric, the user sees the frame rather than the fabric when the umbrella is actually in operation.

6. Corrosion: Despite electroplating of some components, inevitably the plating wears away after a certain amount of use of the umbrella, and, as the umbrella is commonly exposed to water, corrosion and seizing up of certain parts occurs.

**[0004]** Therefore, the invention provides an umbrella skeleton to mitigate or obviate the aforementioned problems.

**[0005]** The main objective of the present invention is to provide an umbrella skeleton to assemble conveniently, and eliminate environmental pollution resulting from electroplating processes.

**[0006]** The umbrella comprises a major shaft with a button provided in a lower part and an umbrella frame.

**[0007]** The umbrella frame has a connection member, a sleeve, a middle runner, a spring, a lower runner, multiple ribs, and first and second stretchers. The umbrella skeleton of this invention includes beneficial points:

1. convenient to assemble: the ribs are inserted in the connection member, the first stretchers are connected between the middle runner and the ribs, and the second stretchers are connected between the lower runner and the first stretchers, which is convenient to assemble.

2. Safety is enhanced: as no iron wires and rivets are used, the umbrella will constitute no hazard to users.

3. No environment pollution: elements of the umbrella of this invention are made of plastic, so electroplating is not required, which eliminates the environmental pollution encountered with the prior art.

4. Easy to replace the elements: If some elements are broken, it is easy for user to replace it by hand, instead of throwing away the whole umbrella.

5. Variety of type and color can be applied: manufacturers may cater to the customers by changing the color or type of the skeleton, thus making the umbrella more pleasing to the eye.

**[0008]** Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

### IN THE DRAWINGS

#### **[0009]**

Fig. 1 is a local exploded view of the umbrella skeleton in accordance with this invention;

Fig. 2 is a perspective view of the umbrella skeleton in accordance with this invention;

Fig. 3 is a local sectional view of the umbrella skeleton in accordance with this invention;

Fig. 4 is a plan view of the spreading umbrella in accordance with this invention; and

Fig. 5 is a plan view of the conventional umbrella skeleton in accordance with this invention.

**[0010]** With reference to Fig. 1, Fig. 2 and Fig. 4, an umbrella skeleton has a major shaft (10) and an umbrella frame (20) mounted over the major shaft (10).

**[0011]** A length of the major shaft (10) is fixed or adjustable as commonly found in umbrellas on the market. The major shaft (10) has a handle (11) in a lower end, and a button (12) provided on a lower part of the major shaft (10) and above the handle (11). The umbrella frame (20) includes a connection member (21), a sleeve (22), a middle runner (23), a spring (24), a lower runner (25), multiple ribs (26), multiple first stretchers (27), and multiple second stretchers (28), wherein the quantities of the ribs (26), the first stretchers (27), and the second stretchers (28) are the same.

**[0012]** The connection member (21) mounted at an upper end of the major shaft (10) has a plurality of flexible connection rods (211) corresponding to the ribs (26). Each connection rod (211) has an aperture (212) to receive the corresponding rib (26).

**[0013]** An upper part of the major shaft (10) is covered by the sleeve (22), and an upper end of the sleeve (22) is in close contact with the connection member (21).

**[0014]** The middle runner (23) is mounted around the major shaft (10) and below the sleeve (22), i.e. the sleeve (22) is mounted between the connection member (21) and the middle runner (23). The middle runner (23) has multiple first connection slots (231) defined equidistantly corresponding to the first stretchers (27). Every first connection slot (231) has two inner walls, and a first pivot hole (232) is defined in each inner wall.

**[0015]** The spring (24) is mounted around the major shaft (10) and below the middle runner (23).

**[0016]** The lower runner (25) is mounted around the major shaft (10) and below the spring (24). The lower runner (25) has multiple second connection slots (251) defined equidistantly corresponding to the second stretchers (28), and each second connection slot (251) has a first pivot rod (252). The lower runner (25) has a recess (254) defined in the top to secure a bottom of the spring (24). In a lower part of the lower runner (25) a clamp hole (253) is defined wherein the button (12) is mounted

**[0017]** As shown in Fig. 1, each rib (26) includes a tube (261), and a pole (262) hidden in the tube (261). The tube (261) has an inserted member (263) in a near end which is received in the aperture (212) of the connection rod (211), and two tabs (264) formed in a distal end, each of which has a second pivot hole (265), whereby the first stretcher (27) is pivotally mounted thereon. A sheath (266) is provided to cover the distal end of the pole (262), or the rib just is a simple long shaft instead.

**[0018]** Each first stretcher (27) is mounted between the middle runner (23) and the corresponding rib (26). The first stretcher (27) has a first pivot member (271) with a first pivot stub (273) formed at one end of the first

stretcher (27), and a second pivot member (272) with a second pivot stub (274) formed at the other end. The first pivot member (271) is received in the first connection slot (231), as shown in Fig. 1 and Fig. 3, and the first pivot stub (273) is pivotally inserted in the first pivot hole (232). The second pivot member (272) is pivotally mounted in the tabs (264) of the tube (261). The second pivot stub (274) is pivotally inserted in the second pivot holes (265). In addition, the first stretcher (27) has a channel (275) defined therein, and a second pivot rod (276) is mounted in the channel (275).

**[0019]** Each second stretcher (28) is mounted between the lower runner (25) and the corresponding first stretcher (27). A first hook member (281) is formed in one end of the second stretcher (28), and a second hook member (282) is formed in the other end. The first hook member (281) clips on the first pivot rod (252) of the lower runner (25), and the second hook member (282) clips on the second pivot rod (276) of the first stretcher (27), besides, the first and second hook members (281, 282) each have a flange formed therein to enhance the connection.

**[0020]** With reference to Fig. 1, Fig. 2 and Fig. 4, a water repellent fabric (30) is fitted over the ribs (26), and the umbrella can be used to provide protection from sunshine or rain. Firstly, the button (12) is pressed, which then escapes from the clamp hole (253), then the lower runner (25) is pushed upward, and the middle runner (23) is also pushed by the spring (24) upward. The first stretchers (27) push the ribs (26) to spread the water repellent fabric (30), and further the second stretchers (28) support the first stretchers (27). When the umbrella is retracted, the above motion is reversed, and the button (12) is secured in the clamp hole (253).

**[0021]** Besides the normal function of the umbrella, the umbrella skeleton of this invention can be assembled by hand conveniently without any rivets and iron wires which eliminates the corrosion found in prior art umbrellas. Furthermore, the sharp end points of the wires are a thing of the past, which enhances the safety. Moreover, most elements can be made of plastic, thus the electroplating step is omitted, which also prevents the pollution from electroplating processes. If any element of the skeleton is broken off, it is easy for users to buy the corresponding element to take place, instead of throwing away the whole umbrella. The manufacturers can also cater to the customers by changing the color or type of the skeleton.

## Claims

1. An umbrella skeleton comprising a major shaft (10) and an umbrella frame (20), wherein a button (12) is provided on a lower part of the major shaft (10); the umbrella frame (20) includes a connection member (21), a sleeve (22), a middle runner (23), a spring (24), a lower runner (25), multiple ribs (26), multiple first stretchers (27), and multiple second stretchers

(28), wherein the quantities of the ribs (26), the first stretchers (27), and the second stretchers (28) are the same;

the connection member (21) is mounted in an upper end of the major shaft; the middle runner (23) and the lower runner (25) are mounted around the major shaft (10) and below the connection member (21); a clamp hole (253) is defined in a lower part of the lower runner (25), the sleeve (22) is provided between the connection member (21) and the middle runner (23), and the spring (24) is mounted around the major shaft (10) and below the middle runner (23);

one near end of each rib (26) is received in the connection member (21), each first stretcher (27) is pivotally mounted between the middle runner (23) and a respective rib (26), and each second stretcher (28) is pivotally mounted between the lower runner (25) and a respective first stretcher (27).

2. The umbrella skeleton as claimed in claim 1, wherein the connection member has a plurality of flexible connection rods (211) corresponding to the ribs (26), and each connection rod (211) has an aperture (212) to receive a corresponding rib (26).

3. The umbrella skeleton as claimed in claim 1, wherein each first stretcher (27) has a first pivot member (271) with a first pivot stub (273) formed in one end of the first stretcher (27), a second pivot member (272) with a second pivot stub (274) formed in the other end; the middle runner (23) has multiple first connection slots (231) defined equidistantly corresponding to the first stretchers (27), each first connection slot (231) has two inner walls, and a first pivot hole (232) is defined between the inner walls; two tabs (264) formed in each rib (26), each of the tabs (264) has a second pivot hole (265), whereby a respective first stretcher is pivotally mounted thereon.

4. The umbrella skeleton as claimed in claim 1, wherein each second stretcher (28) is mounted between the lower runner (25) and a corresponding first stretcher (27); a first hook member (281) formed in one end of each second stretcher (28), and a second hook member (282) formed in the other end of each second stretcher (28), each first hook member (281) clips on a first pivot rod (252) of the lower runner (25), and each second hook member (282) clips on a second pivot rod (276) of the respective first stretcher (27).

5. The umbrella skeleton as claimed in claim 4 wherein each first and second hook member (281,282) respectively has a flange formed therein.

6. The umbrella skeleton as claimed in claim 1 wherein the lower runner (25) has a recess (254) defined in

a top face to secure a bottom of the spring (24).

7. The umbrella skeleton as claimed in claim 1, wherein each rib is a long shaft.

8. The umbrella skeleton as claimed in claim 1, wherein each rib (26) includes a tube (261), and a pole (262) hidden in the tube (261), the tube (261) has an inserted member (263) in one end which is received in the aperture (212) of the connection rod, and two tabs (264) are formed in the other end of the tube (261).

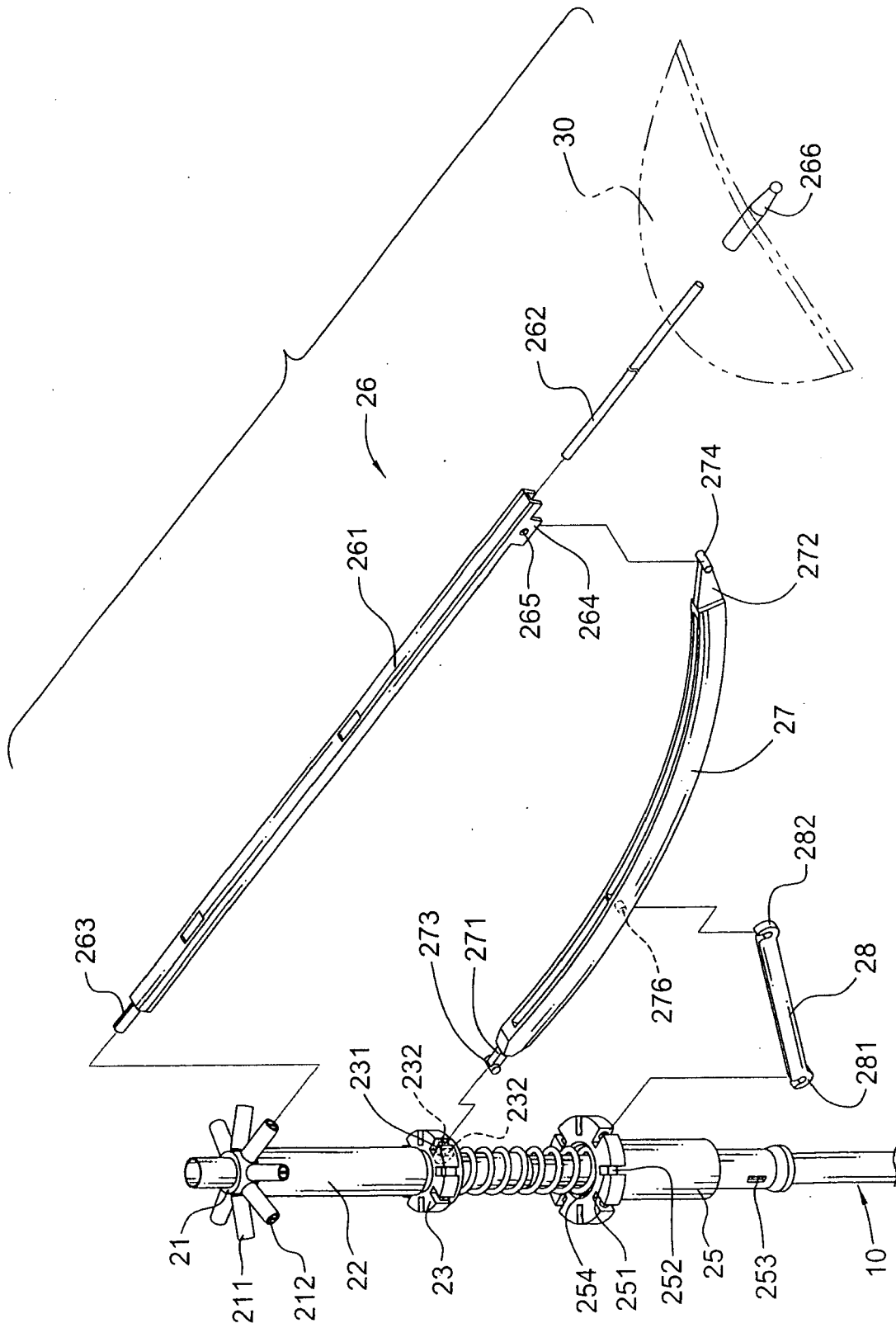


FIG.1

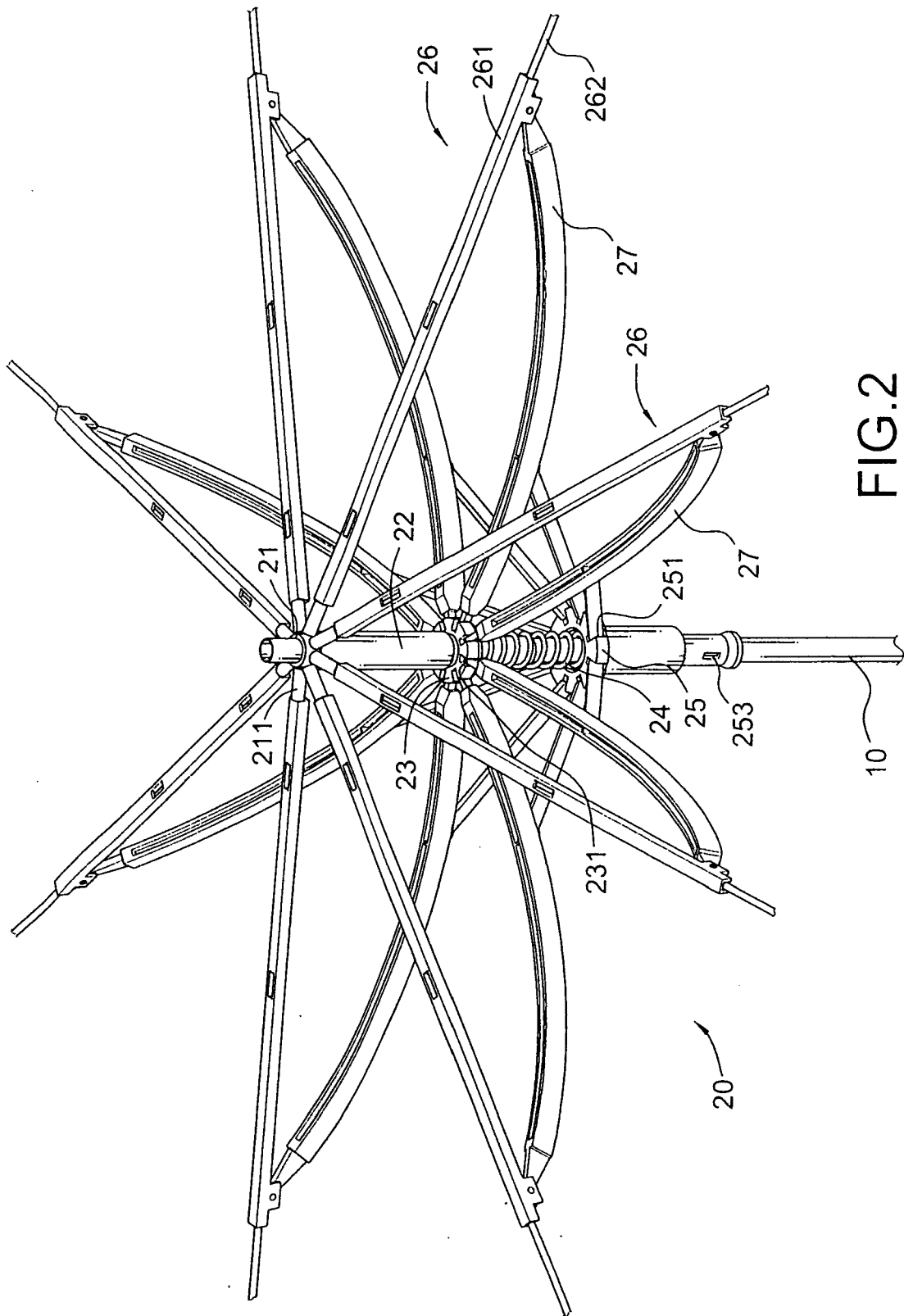


FIG.2

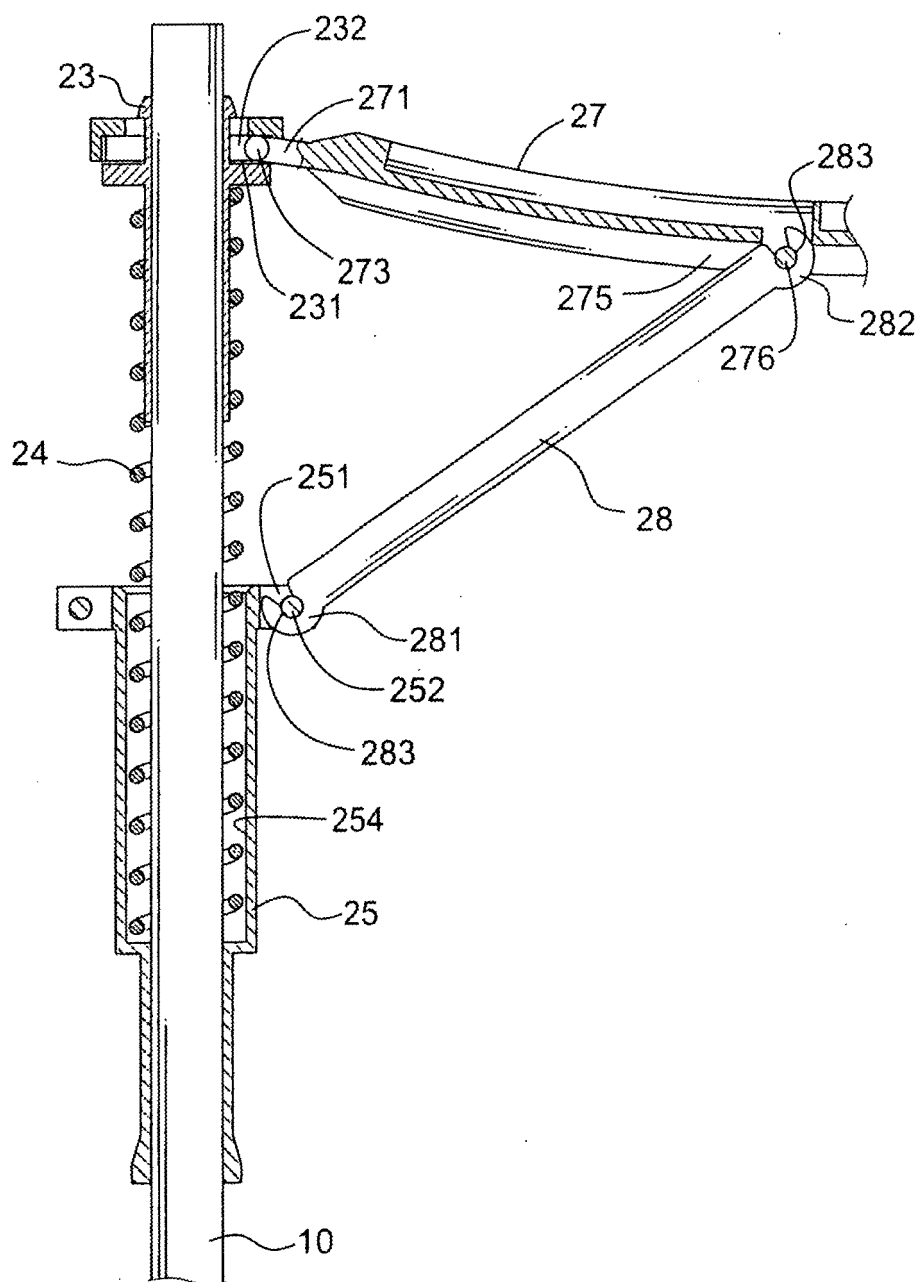


FIG.3

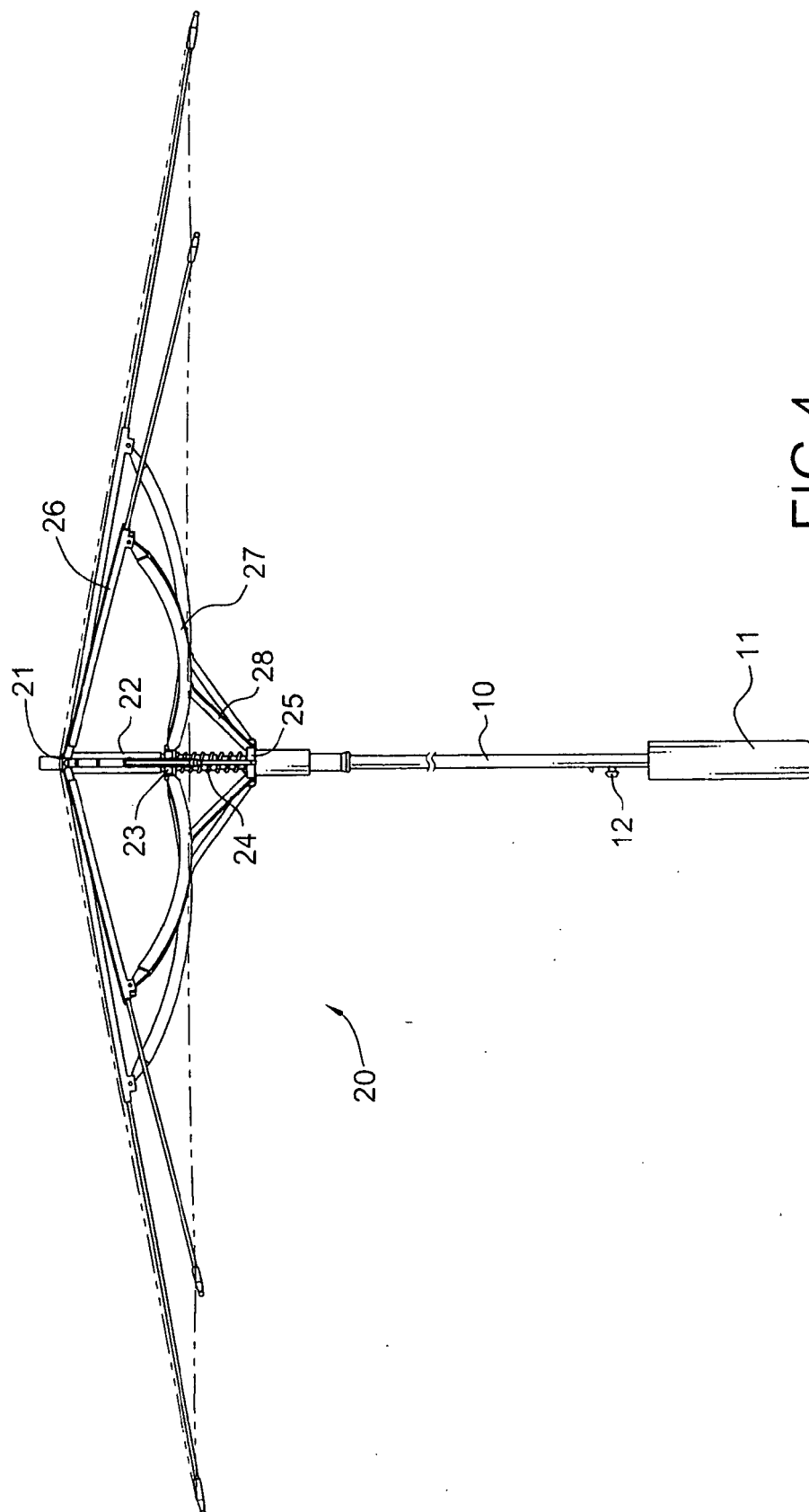


FIG. 4



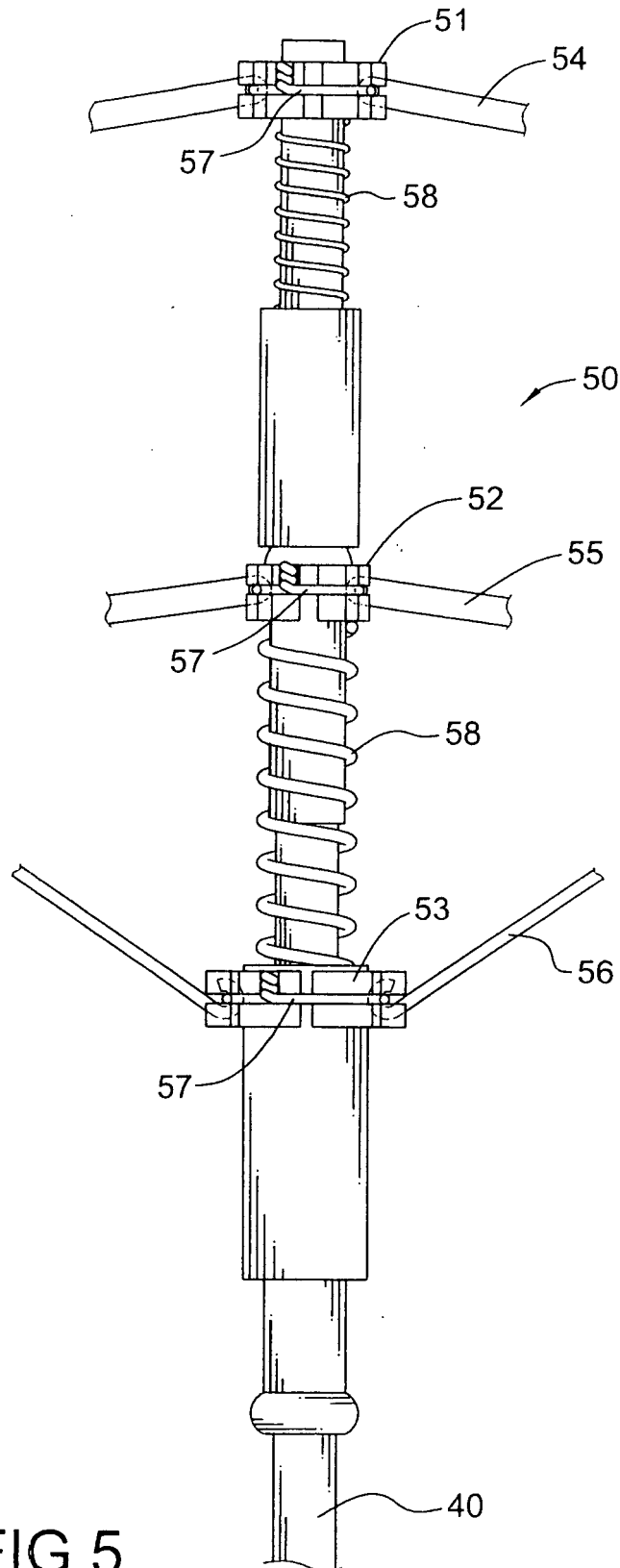


FIG.5  
PRIOR ART



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 05 01 9912

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 085 239 A (CHIN-HUNG ET AL) 4 February 1992 (1992-02-04) * column 1, line 46 - line 66; figures 1-3,4A,4B,5,6A,6B *	1,3,7	INV. A45B25/02
Y	-----	2	
Y	GB 1 106 275 A (WILLIAM HOYLAND & COMPANY LIMITED) 13 March 1968 (1968-03-13) * page 2, line 40 - line 57; figures 1-3 *	2	
X	US 6 158 452 A (YOU ET AL) 12 December 2000 (2000-12-12) * column 3, line 41 - column 4, line 3; figures 1-4 *	1,6,7	
Y	-----	4,5	
Y	US 4 202 363 A (CRAWFORD, LYNN D ET AL) 13 May 1980 (1980-05-13) * column 3, line 49 - column 4, line 4; figures 3,4 *	8	TECHNICAL FIELDS SEARCHED (IPC)  A45B
Y	* column 6, line 32 - line 53; figures 3,4 *	4,5	
Y	----- PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11, 26 December 1995 (1995-12-26) -& JP 07 222613 A (MISUMI KOGYO KK), 22 August 1995 (1995-08-22) * abstract; figures *	8	
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>24 April 2006</b>	Examiner <b>Dinescu, D</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 01 9912

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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24-04-2006

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5085239	A	04-02-1992	NONE	
GB 1106275	A	13-03-1968	NONE	
US 6158452	A	12-12-2000	NONE	
US 4202363	A	13-05-1980	AU 5654680 A	24-09-1981
			DE 3010408 A1	05-11-1981
			FR 2477853 A1	18-09-1981
			GB 2071727 A	23-09-1981
			US 4193413 A	18-03-1980
			US 4195651 A	01-04-1980
JP 07222613	A	22-08-1995	NONE	