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(54) **Wind resistant umbrella**

(57) The umbrella (10) having a shaft (20), a plurality of ribs (40) movably engaged to the shaft (20), an umbrella cloth (30) having a periphery (34) and an internal surface (32) attached on the ribs (40), and in addition, a strengthening member (100) in form of a loop operatively associated to the internal surface (32) of the umbrella cloth (30) at a position adjacent to the periphery (34) of

the umbrella cloth (30). The size of the loop is smaller than the periphery (30) of the umbrella cloth (30) such that the strengthening member (100) pulls the umbrella cloth (30) against the ribs (40) when the umbrella is open. The strengthening member (100) reinforces the ribs (40) against the upward force from the wind, and resists the ribs (40) from flexing upward.

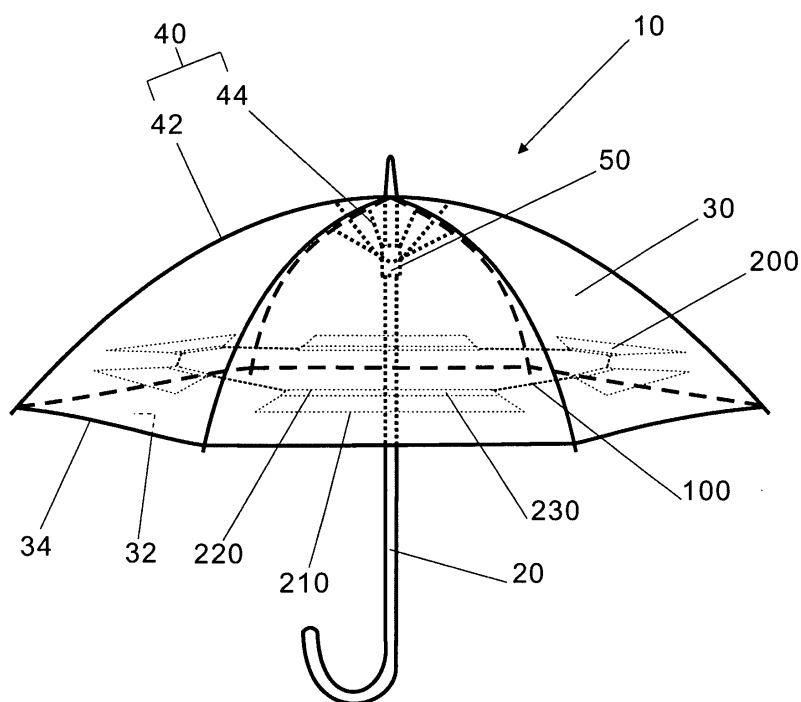


Fig. 1

Description

[0001] The present invention relates generally to umbrellas.

[0002] Most umbrellas, in particular the folding umbrellas, are easily flexed by strong wind which unduly asserts pressure on the internal surface of the umbrella cloth. Some umbrellas use ribs made of a flexible material to divert the wind, or rib structure specially designed to resist the wind. The disadvantage of such umbrellas is that it involves the modification on the existing rib structure which usually results in a significant increase in the production cost.

[0003] PRC Pat. Publication No. CN 1264560A discloses an umbrella having openings on the umbrella cloth for the wind to pass through the umbrella cloth without causing much pressure on the ribs. Although the openings are covered by some shielding cloth, the heavy rain may still easily enter into the openings and wet the user.

[0004] The object of the present invention is to provide an umbrella which resists wind from easily flexing the ribs upward.

[0005] The umbrella of this invention has a shaft, a plurality of ribs movably engaged to the shaft, an umbrella cloth having a periphery and an internal surface attached on the ribs, and in addition, a strengthening member in form of a loop operatively associated to the internal surface of the umbrella cloth at a position adjacent to the periphery of the umbrella cloth. The size of the loop is smaller than the periphery of the umbrella cloth such that the strengthening member pulls the umbrella cloth against the ribs when the umbrella is open. The strengthening member reinforces the ribs against the upward force from the wind, and resists the ribs from flexing upward.

[0006] Preferably, the strengthening member is attached to the internal surface of the umbrella cloth by a connecting member. The connecting member has a first end attached to the umbrella cloth at a position adjacent to the periphery of the umbrella cloth, and a second end for holding the strengthening member when the umbrella is open.

[0007] The present invention is applicable to any conventional umbrella, whether foldable or unfoldable, without modifying the existing rib structure of the umbrella.

[0008] The above and other aspects, features, and advantages of the present invention will become more apparent upon consideration of the following detailed description of preferred embodiments, taken in conjunction with the accompanying drawing figures, wherein:-

Fig. 1 is a perspective view of an umbrella according to an embodiment of this invention.

Fig. 2 is a top perspective view of the umbrella of Fig. 1.

Fig. 3 is a perspective view of the umbrella cloth sec-

tion [39] of Fig. 2.

Fig. 4 is a sectional view of the umbrella of Fig. 1.

Fig. 5 is a perspective view of an umbrella according to another embodiment of this invention.

Fig. 6 is a top perspective view of the umbrella of Fig. 5.

Fig. 7 is a sectional view of the umbrella of Fig. 5.

[0009] As illustrated in Fig. 1, a conventional umbrella [10] includes a shaft [20], an umbrella cloth [30] and a plurality of ribs [40] for supporting the umbrella cloth [30]. The ribs [40] are movably engaged to the shaft [20] for opening and closing the umbrella [10]. The ribs [40] may include main ribs [42] for attaching to the internal surface [32] of the umbrella cloth [30] and the branch ribs [44] for stretching the main ribs [42]. The branch ribs [44] may be attached to a collar [50] slideable along the shaft [20] at one end and the main ribs [42] at the other end.

[0010] The umbrella [10] may be a foldable umbrella. In that case, the main ribs [42] may be foldable and the shaft [20] may be telescopic for folding the umbrella [10] when not in use.

[0011] When the umbrella [10] is open, the wind may assert undue pressure on the internal surface [32] of the umbrella cloth [30] and flex the main ribs [42] upward. In the embodiment as shown in Figs. 1, 2 and 3, a strengthening member [100] is used to reinforce the main ribs [42]. The strengthening member [100] may be a flexible cord in form a loop having a size smaller than the periphery [34] of the umbrella cloth [30] when the umbrella [10] is open. By way of example, the cord for the strengthening member [100] is made of nylon. A number of cords may be applied to enhance the strengthening member [100] if necessary.

[0012] The strengthening member [100] is attached to the internal surface [32] of the umbrella cloth [30] adjacent to the periphery [34] by a connecting member [200]. The connecting member [200] may be a number of strips of cloth each attached to an umbrella cloth section [35] at a first end [210]. A channel [230] may be formed at the second end [220], for example, by sewing the cloth at the portion near the second end [220], for receiving the strengthening member [100]. When the umbrella [10] is open, the connecting member [200] holds the strengthening member [100] at the second end [220]. The strips of cloth may also be connected as one piece of cloth forming the connecting member [200]. The strip of cloth may be made of the same material of the umbrella cloth [30].

[0013] By way of non-limiting example, the connecting member [200] may be attached to the umbrella cloth section [35] at about 6cm to 20cm from the periphery [34] of the umbrella cloth [30], the first end [210] may be about 4cm to 14cm from the second end [220] of the connecting

member [200], depending on the size of the umbrella [10]. The bigger the umbrella size, the larger the distance between the first end [210] and the second end [220] of the connecting member [200]. Each strip of cloth may be positioned about 6cm from each adjacent main rib [42].

[0014] The size of the loop of the strengthening member [100] is predetermined such that when the umbrella [10] is open, the connecting member [200] is pulled flat by the strengthening member [100]. The umbrella cloth [30] is pulled against the main ribs [42] against the upward force from the wind. The strengthening member [100] links the main ribs [42] together so that the force from the wind can be spread across the main ribs [42], and resists the main ribs [42] from flexing upward. The strengthening member [100] performs best if the connecting member [200] is pulled flat and forms a substantial right angle adjacently with the shaft [20] as shown in Fig. 4 when the umbrella [10] is open.

[0015] When the umbrella [10] is closed, the strengthening member [100] and the connecting member [200] are folded due to their flexible nature. The strengthening member [100] is contained inside the connecting member [200] and is prevented from entangling with the ribs [40].

[0016] As shown in Figs. 5, 6 and 7, in another embodiment, the connecting member [300] may be a number of strips of cloth each sewed together to the internal surface [32] of the umbrella cloth section [35] at the first end [310]. The strip of cloth forms a tube for receiving the strengthening member [100]. When the umbrella [10] is open, the tubular strip of cloth is pulled flat by the strengthening member [100] and holds the strengthening member [100] at the second end [320].

[0017] The strengthening member [100] and the connecting member [200] may be applied to the umbrellas of any existing rib structure and without modifying the rib structure.

[0018] While the invention has been described in detail with reference to disclosed embodiments, various modifications within the scope of the invention will be apparent to those of ordinary skill in this field. It is to be appreciated that features described with respect to one embodiment typically may be applied to other embodiments.

Claims

1. An umbrella, having a shaft, a plurality of ribs movably engaged to the shaft, and an umbrella cloth having a periphery and an internal surface attached on the ribs, **characterized in that** the umbrella further comprises:

a strengthening member in form of a loop operatively associated with the internal surface of the umbrella cloth at a position adjacent to said periphery, wherein the size of said loop is smaller than said periphery, for pulling the umbrella cloth against the ribs when the umbrella is open,

whereby said strengthening member reinforces the ribs against the upward force from the wind, and resists the ribs from flexing upward.

2. The umbrella, as recited in claim 1, further comprising a connecting member having a first end attached to said internal surface of the umbrella cloth at a position adjacent to said periphery, and a second end for holding the strengthening member when the umbrella is open.
3. The umbrella, as recited in claim 2, wherein said connecting member forms a substantial right angle adjacently with the shaft when the umbrella is open.
4. The umbrella, as recited in claim 2, wherein said connecting member is a strip of cloth forming a channel at the second end for receiving the strengthening member.
5. The umbrella, as recited in claim 2, wherein said connecting member is a tubular strip of cloth for receiving the strengthening member.
6. The umbrella, as recited in claim 1, wherein the strengthening member is a flexible cord.

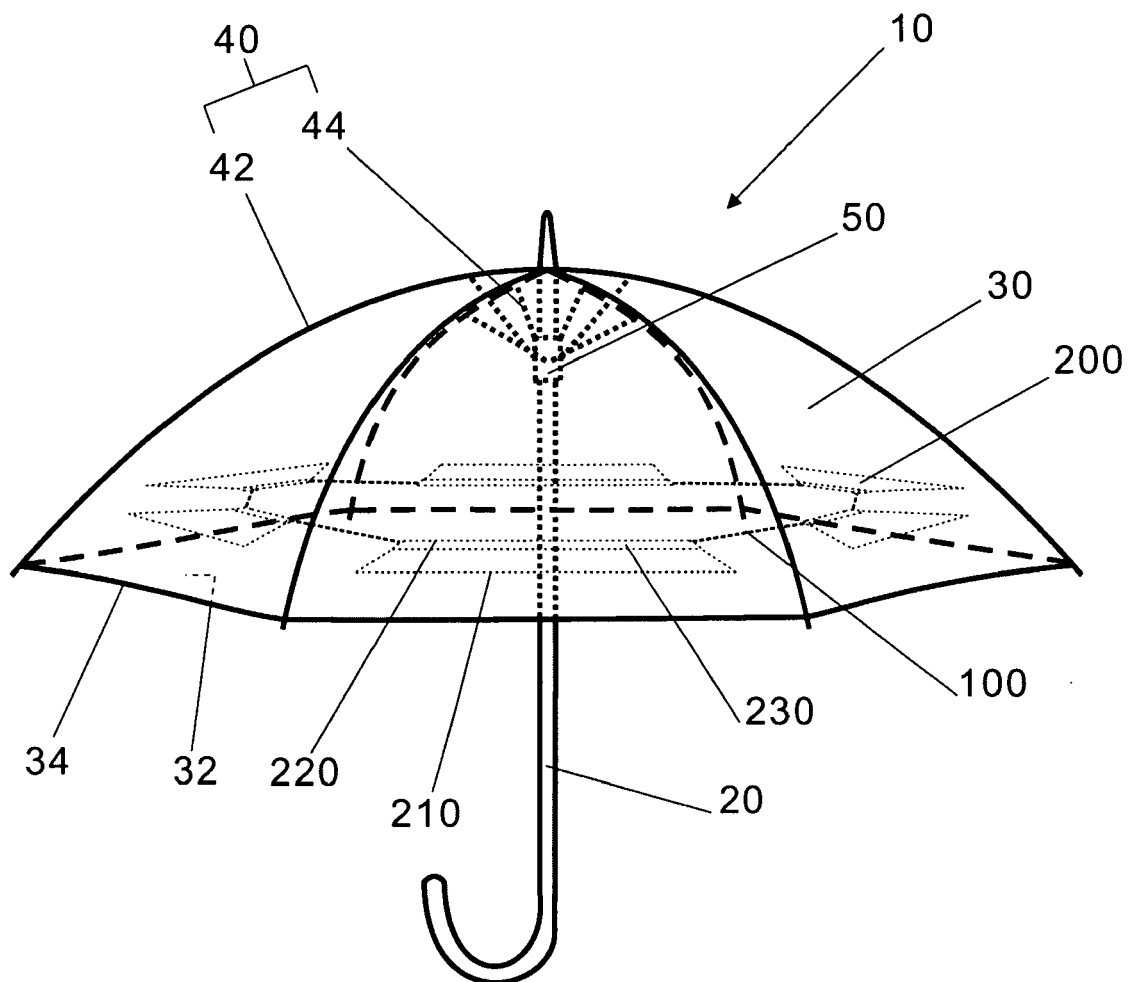


Fig. 1

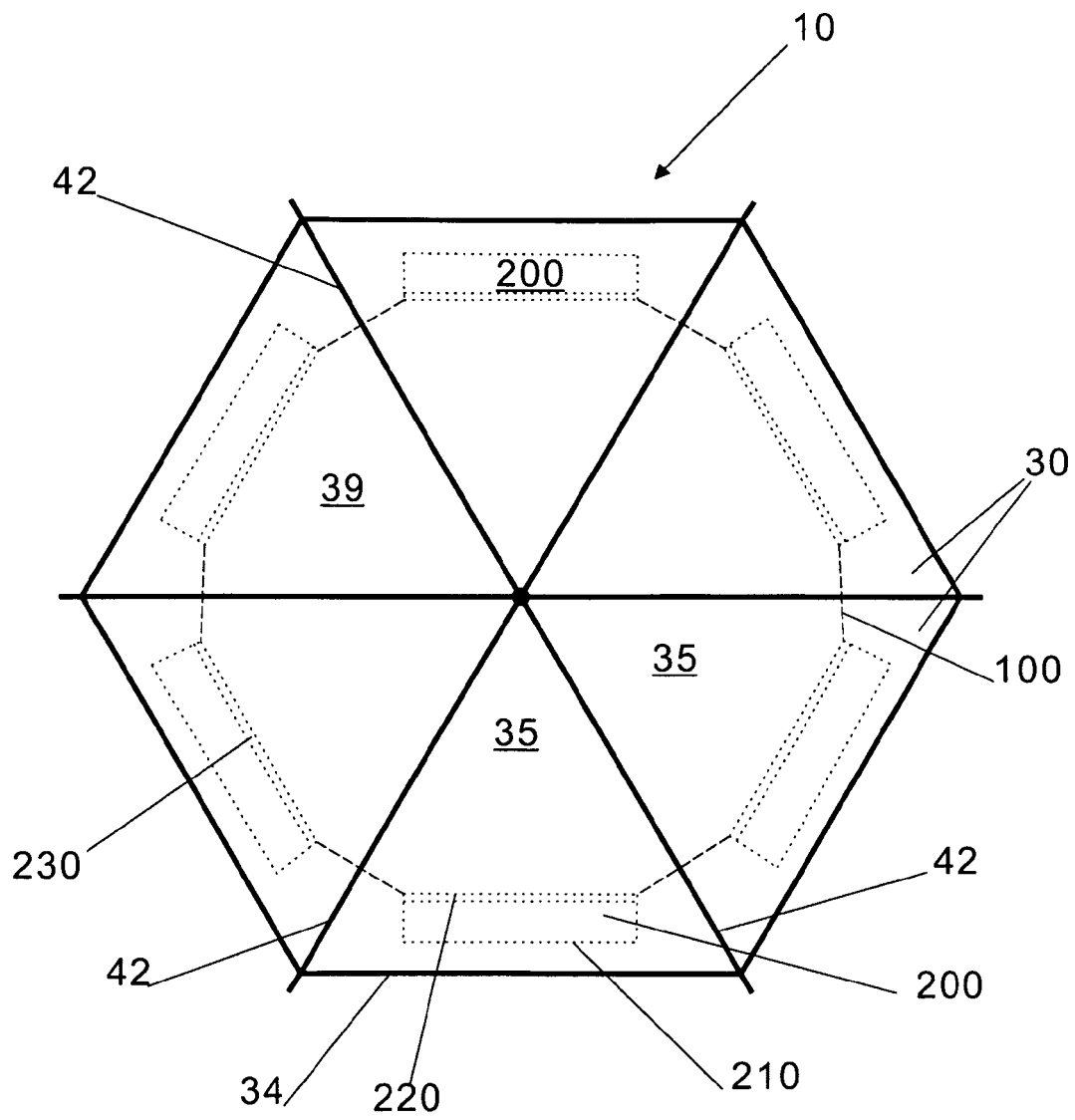
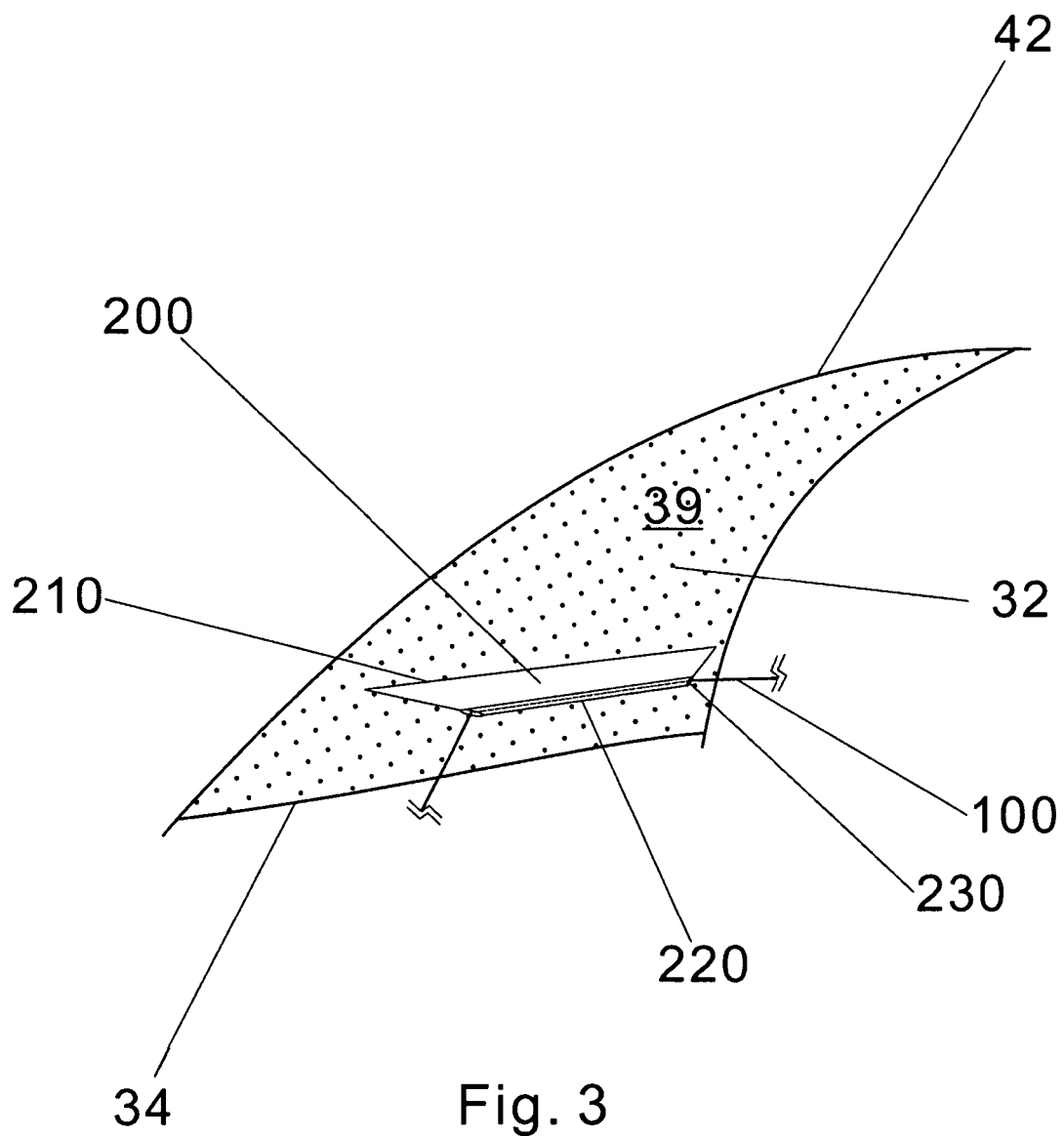


Fig. 2



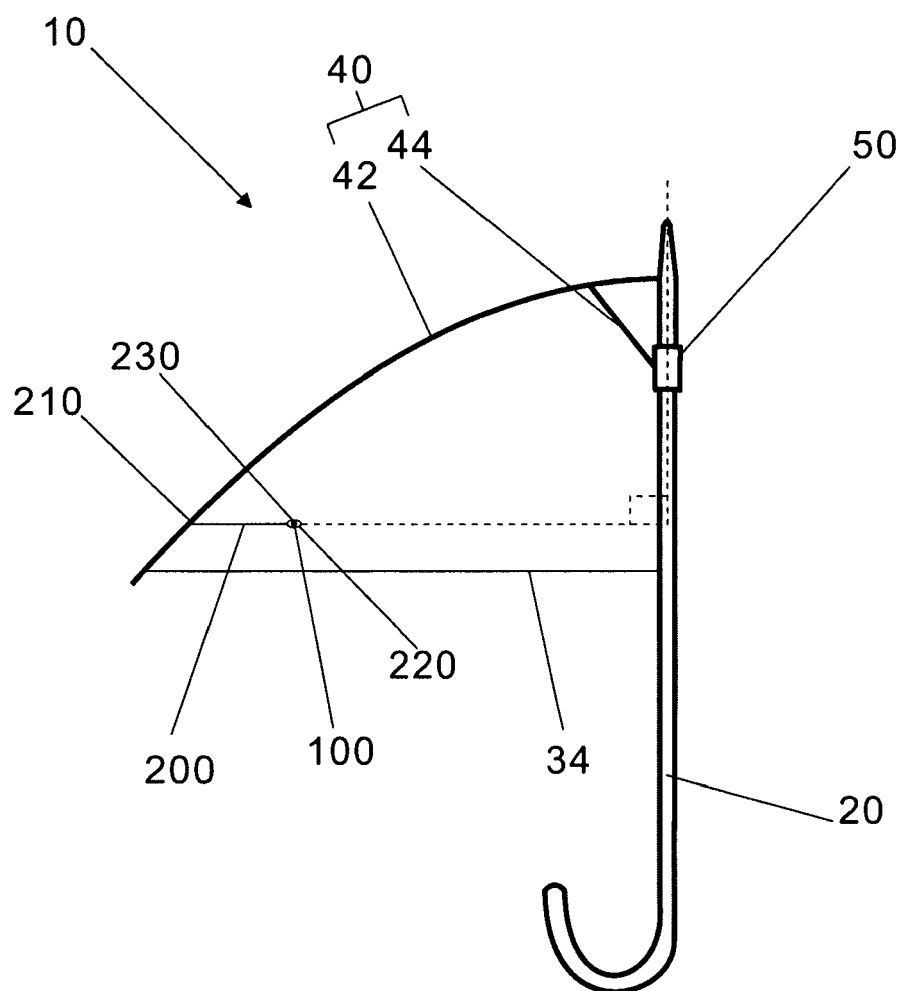


Fig. 4

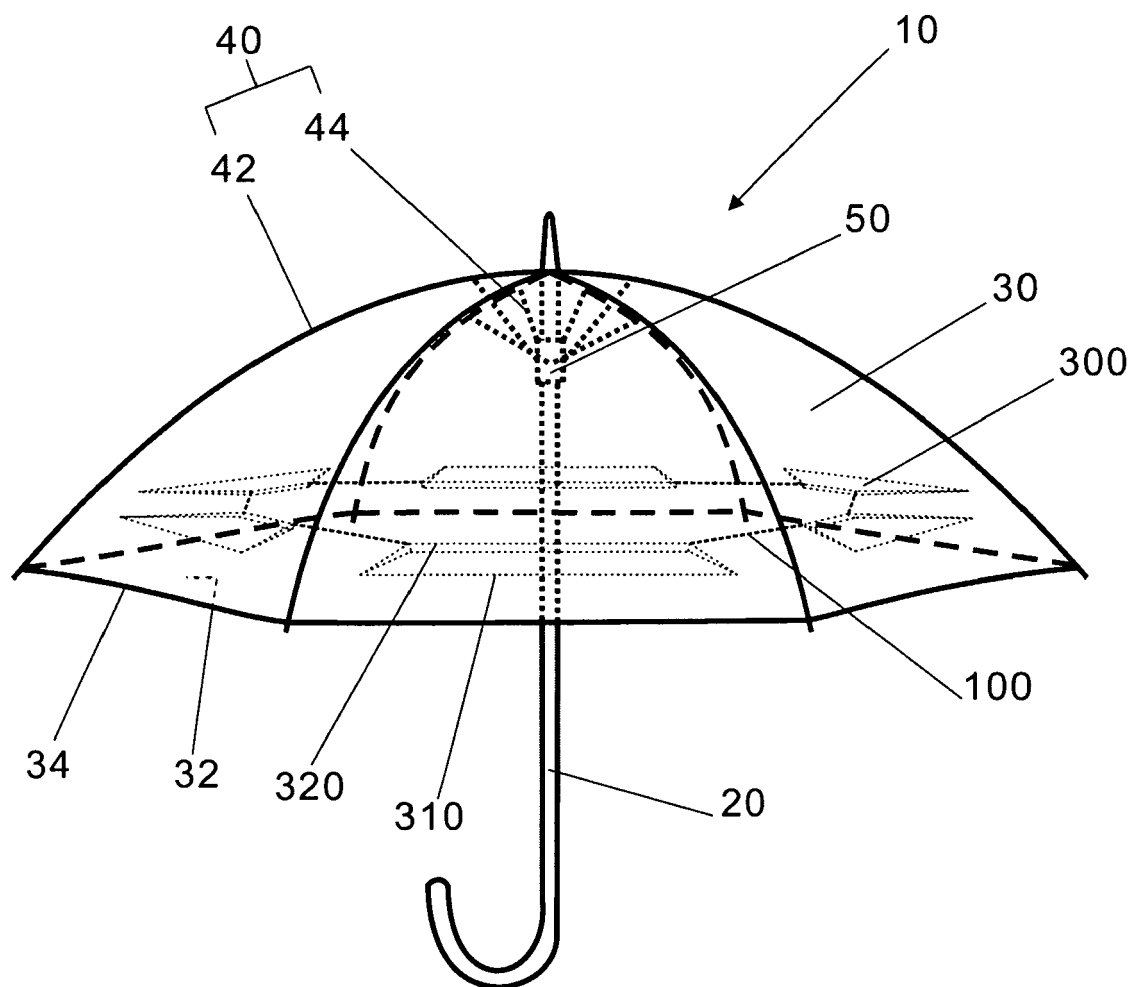


Fig. 5

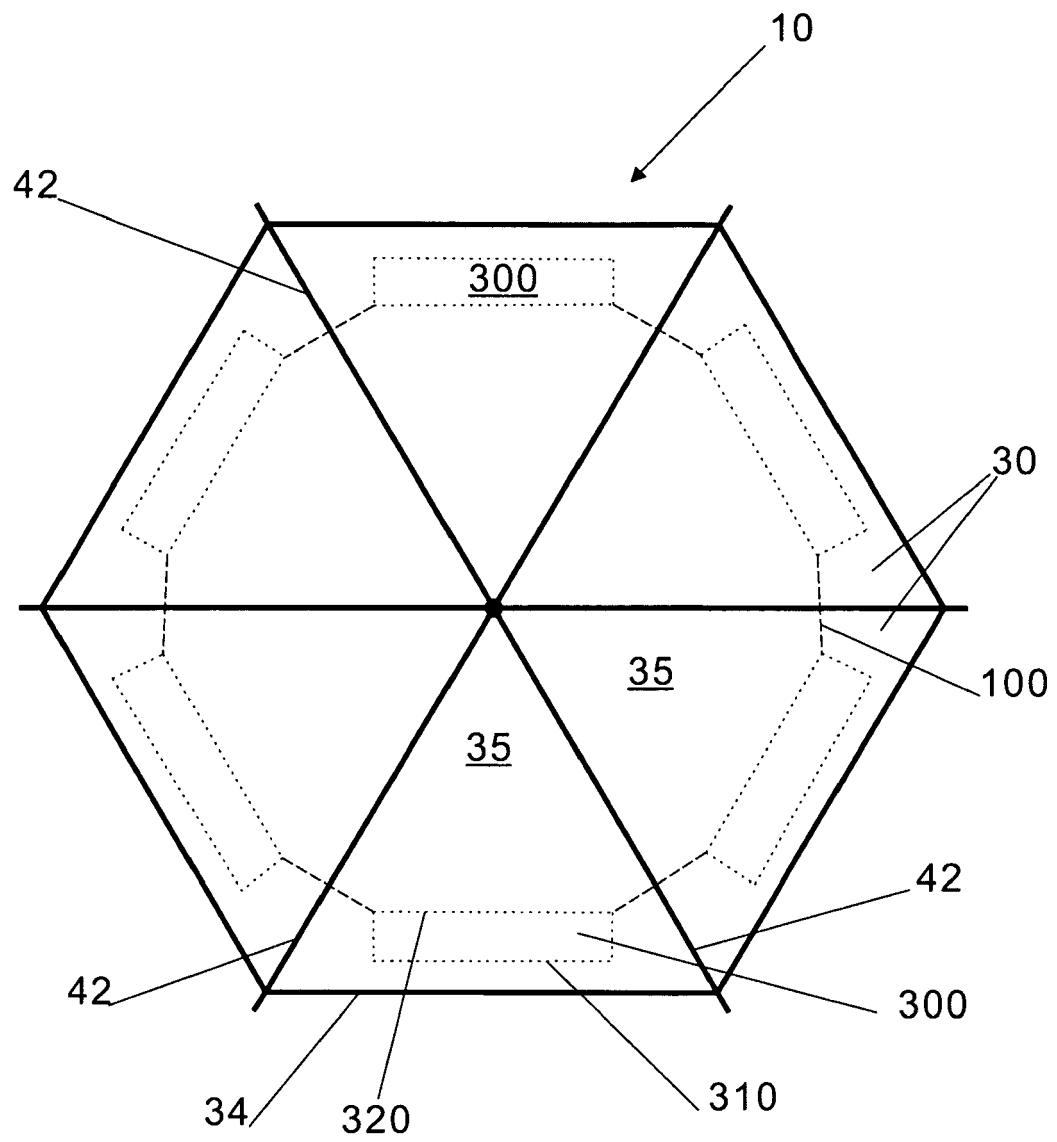


Fig. 6

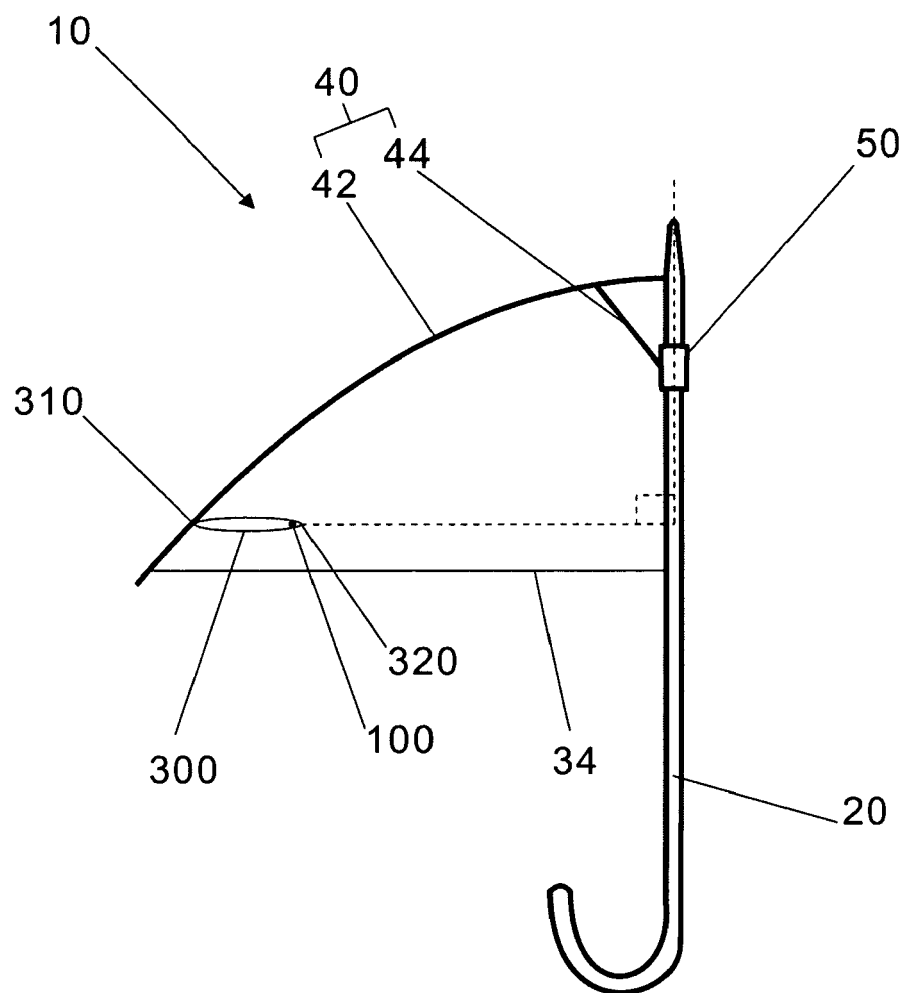


Fig. 7



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 4182

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 4 300 582 A (DESARNO JAMES G) 17 November 1981 (1981-11-17) * column 2; figures *	1-6	INV. A45B25/22
X	US 122 453 A (GOSSIP GEORGE) 2 January 1872 (1872-01-02) * the whole document *	1,6	
			TECHNICAL FIELDS SEARCHED (IPC)
			A45B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 June 2007	Examiner Dinescu, Daniela
CATEGORY OF CITED DOCUMENTS 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		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 & : member of the same patent family, corresponding document	

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

EP 07 00 4182

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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13-06-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4300582	A	17-11-1981	NONE

US 122453	A		NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 1264560 A [0003]