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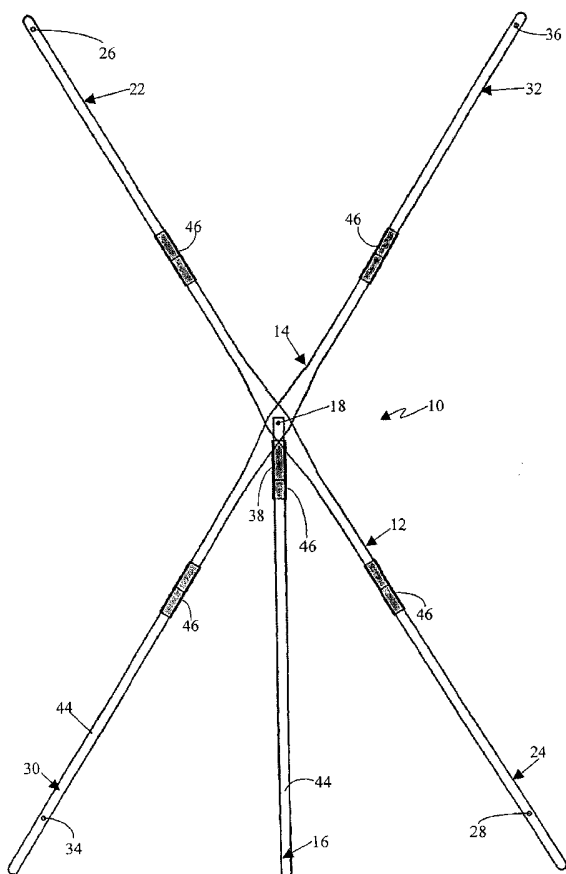
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(54) Title: DISPLAY APPARATUS

(57) Abstract: Display apparatus including first (12) and second (14) members, the members being resiliently deformable so that an object coupled between respective end portions (24,30) of the members is held in tension by said end portions, wherein the members are arrangerable about a common axis (18) of rotation to thereby change the height to width ratio of the apparatus.



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## DISPLAY APPARATUS

### Technical Field

5 The present invention relates to display apparatus.

### Background Art

10 Display apparatus may be used to support banners, for example, in a manner that presents an aspect of the banner for viewing. Banners, posters or the like, may be draped over the display apparatus so that one side of the banner is presented for viewing. Alternatively, the banner may be suspended between first and sections of the display apparatus for viewing.

### Summary of the invention

15

In accordance with the present invention there is provided display apparatus including first and second members, the members being resiliently deformable so that an object coupled between respective end portions of the members is held in tension by said end portions, wherein the members are arrangable about a common axis of rotation to thereby change  
20 the height to width ratio of the apparatus.

In accordance with the present invention, there is also provided an object coupled to a display apparatus, the display apparatus including first and second members, the members being resiliently deformable so that the object is coupled between respective end portions  
25 of the members and is held in tension by said end portions, wherein the members are arrangable about a common axis of rotation to thereby change the height to width ratio of the apparatus.

In accordance with the present invention, there is also provided display apparatus including  
30 first and second members, the members being resiliently deformable so that an object coupled between respective end portions of the members is held in tension by said end

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portions, wherein the members are arranged about a common axis of rotation to thereby change the height to width ratio of the apparatus.

In accordance with the present invention, there is also provided an object coupled to a display apparatus, the display apparatus including first and second members, the members being resiliently deformable so that the object is coupled between respective end portions of the members and is held in tension by said end portions, wherein the members are arranged about a common axis of rotation to thereby change the height to width ratio of the apparatus.

10

#### **Brief Description of the Drawings**

The invention is further described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

15

Figure 1 is a front view of a display apparatus in accordance with the invention;

Figure 2 is an exploded front view of the display apparatus of Figure 1;

Figure 3 is a perspective view of a display apparatus in accordance with the invention, arranged with a banner;

20 Figure 4 is a side view of the display apparatus of Figure 3.

Figure 5 is a plan view of two members of the display apparatus joined by a coupling;

Figure 6 is a cross-sectional view, along the line A-A, of the coupling shown in of Figure 5.

25 Figure 7 is a perspective view of two members of the display apparatus arranged for joining by an alternative coupling;

Figure 8 is a perspective view of two members of the display apparatus arranged for joining by another alternative coupling;

Figure 9 is a perspective view of two members of the display apparatus arranged for joining by another alternative coupling;

30 Figure 10 is an additional perspective view of the alternative coupling shown in Figure 9; and

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Figure 11 is a plan view of the coupling shown in Figure 9.

### **Detailed Description of Preferred Embodiments of the Invention**

5 The display apparatus 10 shown in Figures 1 and 2 is intended for use as a stand for supporting objects such as banners in a manner that facilitates viewing of at least one aspect of the banner. The apparatus 10 includes first and second elongate flexible cross-members 12,14 that are overlapped to form an "X". A bolt 18 extends through apertures (not shown) disposed midway along the cross-members 12,14. The cross-members 12,14  
10 are secured in position along the bolt 18 by screwing the nut 20 down the helical thread of the shaft of the bolt 18. The cross-members 12,14 are separated along the bolt 18 by a washer (not shown). The washer assists the cross-members 12,14 to move with respect to each other about a common axis of rotation, being the axis of the bolt 18.

15 The bolt 18 also extends through an aperture in a third member 16. The third member 16 is coupled, towards one end thereof, to the cross-members 12,14 by the nut 20 and bolt 18. A washer (not shown) separates the third member 16 from the cross-members 12,14. The third member 16 is bent at a proximal end 38 so that the third member is not parallel to the first and second cross-members 12,14.

20

A pair of end portions 24,30 of the first and second cross-members 12,14 disposed at a common end of the display apparatus 10, together with the third member 16, are arrangerable to form a tripod shaped stand for the display apparatus 10, as shown in Figures 3 and 4. The tripod shape formed is formed when a banner, for example, is suspended  
25 between end portions 22,24,30,32 of the cross-members 12,14.

The end portions 22,24,30,32 of the cross-members 12,14 include flanges 23,25,27,29 that extend generally towards a back portion 31 of the display apparatus 10 when the apparatus is not in use. Each flange 23,25,27,29 includes a projection 26,28,34,36 that extends  
30 generally towards the front portion 33 of the display apparatus 10 and at right angles to their respective flanges 23,25,27,29. The projections 26,28,34,36 are shaped for insertion

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into corresponding eyeholes 13 in the banner 42, for example, to be supported by the display apparatus 10. The banner 42 is secured to the display apparatus 10 when all of the projections 26,28,34,36 are coupled to respective corresponding eyeholes 13 of the banner 42.

5

A generally rectangular banner 42 may be connected to the display apparatus 10 by inserting the projections 28,34 of the end portions 24,30, at the mentioned one end 40 of the display apparatus 10, through corresponding eyeholes 13 in the bottom corners of the banner 42. With the one end 40 of the display apparatus 42 positioned on a ground surface, the first cross-member 12 may be resiliently bent by hand into an arc shape so that the projection 26 moves towards a corresponding eyehole 13 in a corner of the banner 42. When the projection 26 and the eyehole 13 are aligned, the projection 26 is inserted into the eyehole 13 and the cross-member 12 is released from the hand of the user. The cross-member 12 is thereby held in resilient engagement with the mentioned corner of the banner 42.

15

The second cross-member 14 may also be resiliently bent by hand into an arc shape so that the projection 36 moves towards a corresponding eyehole 13 in a corner of the banner 42. When the projection 36 and the eyehole 13 are aligned, the projection 36 is inserted into the eyehole 13 and the cross-member 14 is released from the hand of the user. The cross-member 14 is thereby held in resilient engagement with the mentioned corner of the banner 42.

20

The bent cross-members 12,14 are held in resilient engagement with the respective corners of the banner 42 and thereby hold the banner 42 in tension. The cross-members 12,14 may, of course, be connected to the banner 42 in any order.

25

While the above embodiment of the invention has been described as having projections 26,28,34,36 that engage respective corners of the banner 42, the apparatus use any suitable means for engaging the corners of the banner 42.

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When a banner 42 is connected to the display apparatus 10 in the described manner, the flanges 23,25,27,29 are generally parallel to a direction of extent of the banner 42.

The height to width ratio of the display apparatus 10 may be adjusted by rotating the cross-  
5 members 12,14 with respect to each other. The display apparatus 10 is thereby adjustable through a range of height to width ratios. The display apparatus 10 may be thus adjusted to suit the height and width of a banner 42 to be supported by the apparatus 10. The degree of tension in a banner 42 connected to the display apparatus 10 is proportional to the degree to which the cross-members 12,14 are required to be bent in order to form the  
10 necessary connections with the banner 42. In order for a banner 42 to be suitably coupled to the display apparatus 10, the height and width of a banner 42 need only approximate a height to width ratio of the above-mentioned range of height to width ratios of the display apparatus 10.

15 The end portions 22,24,30,32 of cross-members 12,14 and a portion 44 of the third member 16 are attached to the remainder of the display apparatus 10 by couplings 46, as shown in Figures 5 and 6. The couplings 46 are open ended "U" shaped sail tracks that slide over and frictionally engages respective ends of members being coupled. The mentioned ends are shaped for insertion into the couplings 46, as shown in Figure 5.

20

The couplings 46 may be any suitable for means of joining two members. For example, the coupling may include a joining member 48 that extends between respective hollow cores 50 of two members, where the hollow cores 50 are shaped to frictionally engage a joining rod 48 therein, as shown in Figures 7 and 8.

25

Alternatively, the coupling 46 includes a joining member 60 shaped for insertion into hollow cores 62, as shown in Figures 9 to 11. The hollow cores are shaped to frictionally engage the joining rod 60 and thereby hold the members together. Additionally, abutting portions 64,66 of the two members of the coupling 46 are shaped so that a first member of  
30 the two members at least partially receives a portion of the second member of the two members.

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The end portions 22,24,30,32 of cross-members 12,14 and a portion 44 of the third member 16 are detachable from their respective couplings 46. Pairs of end portions of the display apparatus 10 may therefore be disconnected from their respective cross-members  
5 12,14 and replaced with end portions of different lengths. Replacing pairs of end portions of the cross-members 12,14 changes the range of the above-mentioned height to width ratios of the display apparatus 10.

The display apparatus 10 may be collapsed for transportation or storage by arranging the  
10 cross-members 12,14 so that they are generally parallel. Detachment of the end portions 22,24,30,32 and the portion 44 of the third member 16 reduces the size of the collapsed display apparatus.

In the context of the preferred embodiment of the invention the display apparatus 10 is  
15 adjustable to accommodate objects of different heights and widths. Further, the preferred embodiment of the invention is generally easy to erect, lightweight and easily collapsible into a transportable form.

The invention can be applied to support various objects, such as the described banner, or  
20 planar sheet like objects, whether flexible or not.

The cross-members 12,14 are pivotally secured to each other by any suitable means that allows the cross-members 12,14 to move with respect to each other about a common axis of rotation.  
25

The display apparatus may be made from a generally transparent material such as a polycarbonate that has the requisite strength and resilience.

The cross-members members 12,14 may include any suitable means for coupling their  
30 respective end portions 22,24,30,32 to an object disposed.



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Once the banner 42 is connected to the display apparatus 10, the orientation of the banner 42 may be changed from portrait to landscape, and vice versa, by rotating the cross-members 12,14 about the third member 16.



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9. A display apparatus claimed in any one of the preceding claims, wherein the third member is rotatable with respect to said members.
- 5 10. A display apparatus claimed in claim 8, wherein the object is arrangable in a landscape orientation by rotation of the members about the third member.
11. A display apparatus claimed in claim 8, wherein the object is arranged in a portrait orientation by rotation of the members about the third member.
- 10 12. A display apparatus claimed in any one of the preceding claims, wherein the members are made of a substantially transparent material.
13. A display apparatus claimed in any one of the preceding claims, wherein the members are made of a poly-carbonate material.
- 15 14. An object coupled to a display apparatus, the display apparatus including first and second members, the members being resiliently deformable so that the object is coupled between respective end portions of the members and is held in tension by said end portions, wherein the members are arrangable about a common axis of rotation to thereby change the height to width ratio of the apparatus.
- 20 10. Display apparatus including first and second members, the members being resiliently deformable so that an object coupled between respective end portions of the members is held in tension by said end portions, wherein the members are arranged about a common axis of rotation to thereby change the height to width ratio of the apparatus.
- 25 11. An object coupled to a display apparatus, the display apparatus including first and second members, the members being resiliently deformable so that the object is coupled between respective end portions of the members and is held in tension by
- 30

- 10 -

said end portions, wherein the members are arranged about a common axis of rotation to thereby change the height to width ratio of the apparatus.

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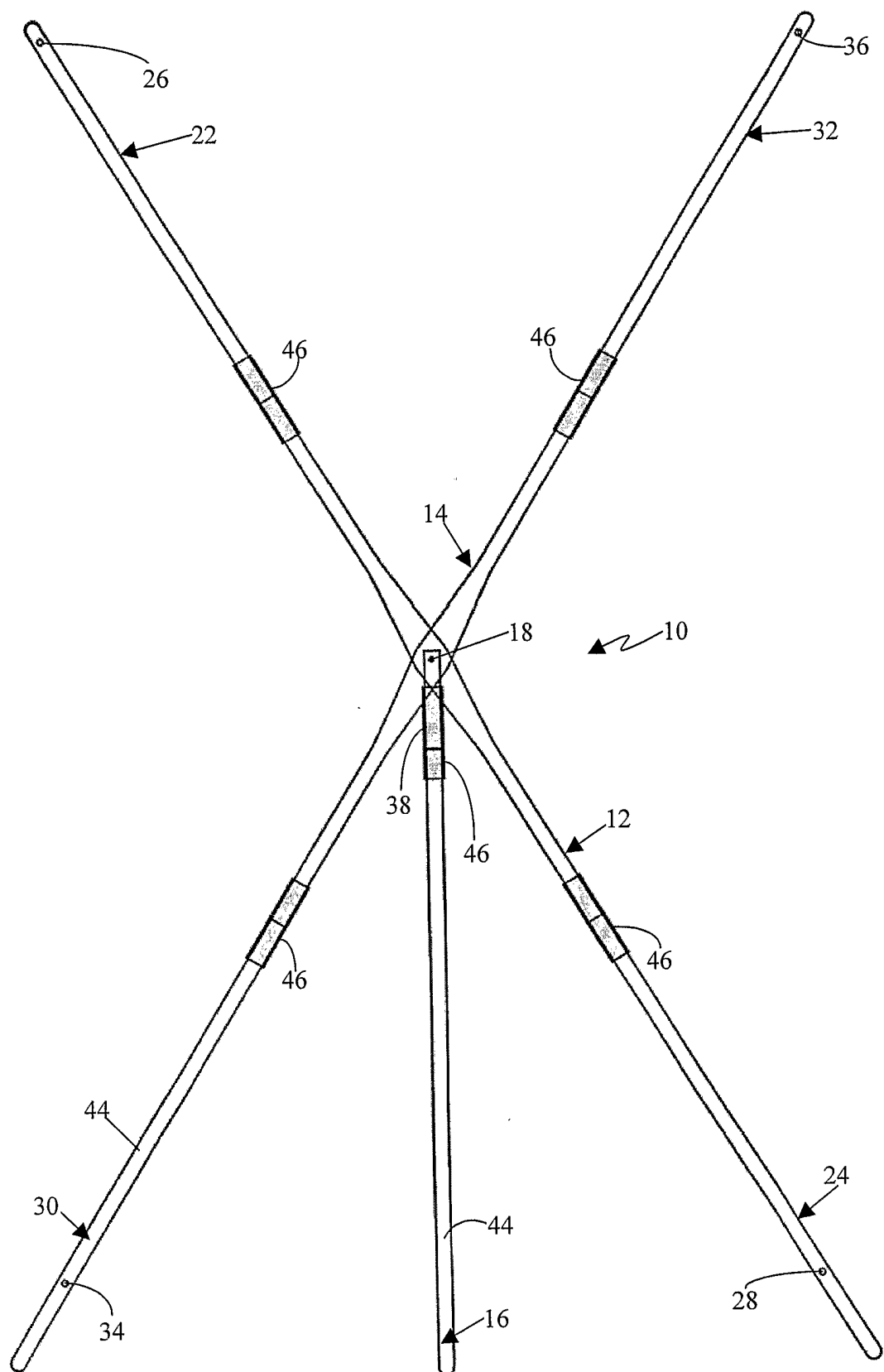


FIGURE 1

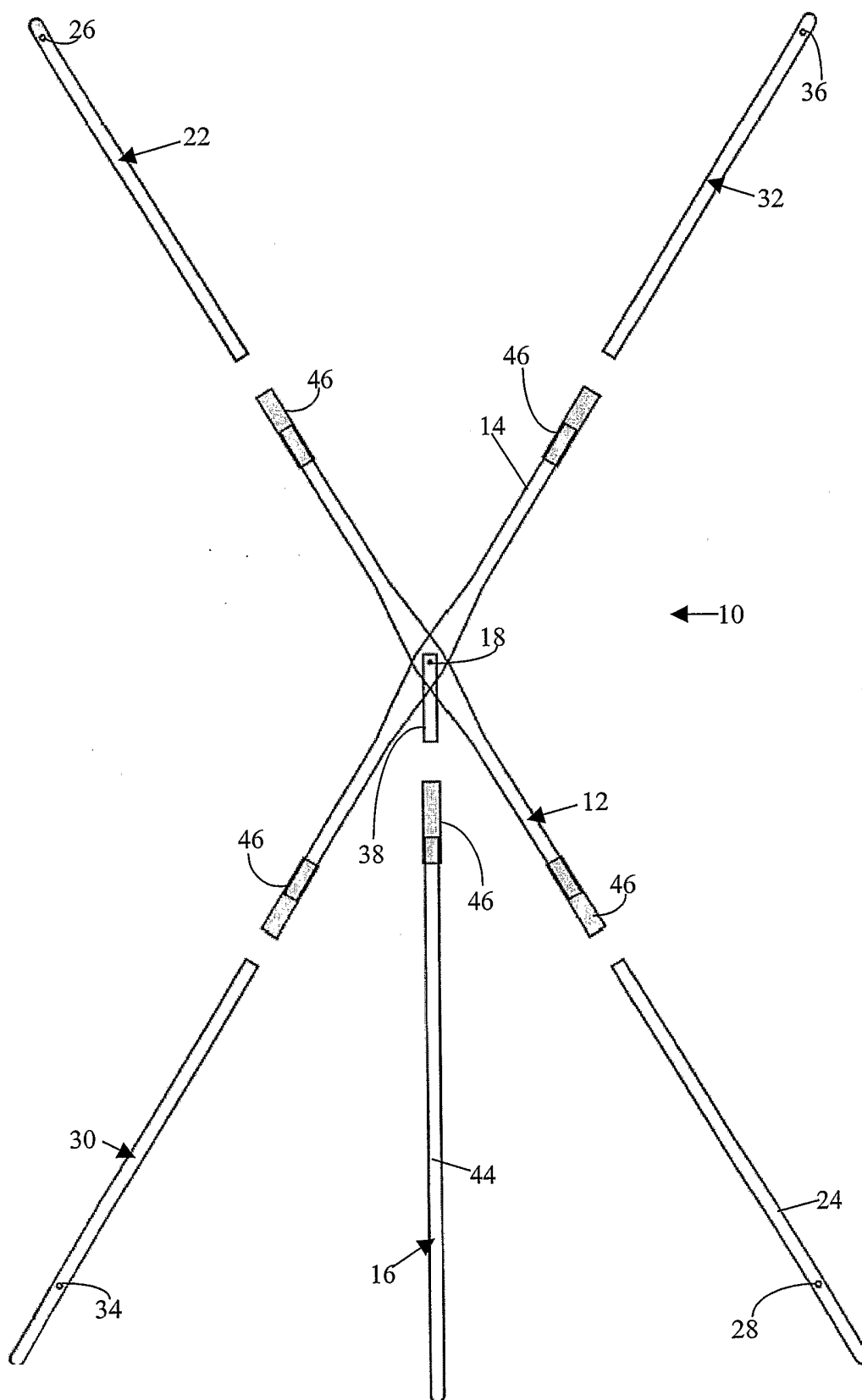


FIGURE 2

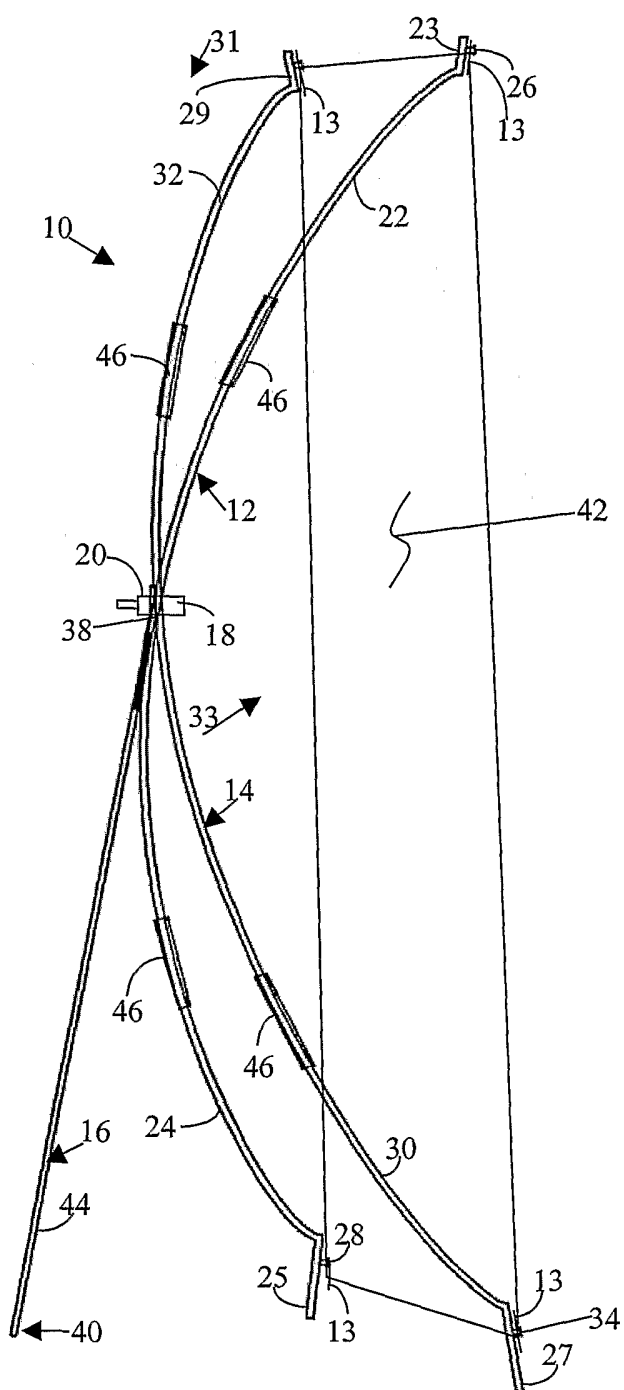


FIGURE 3

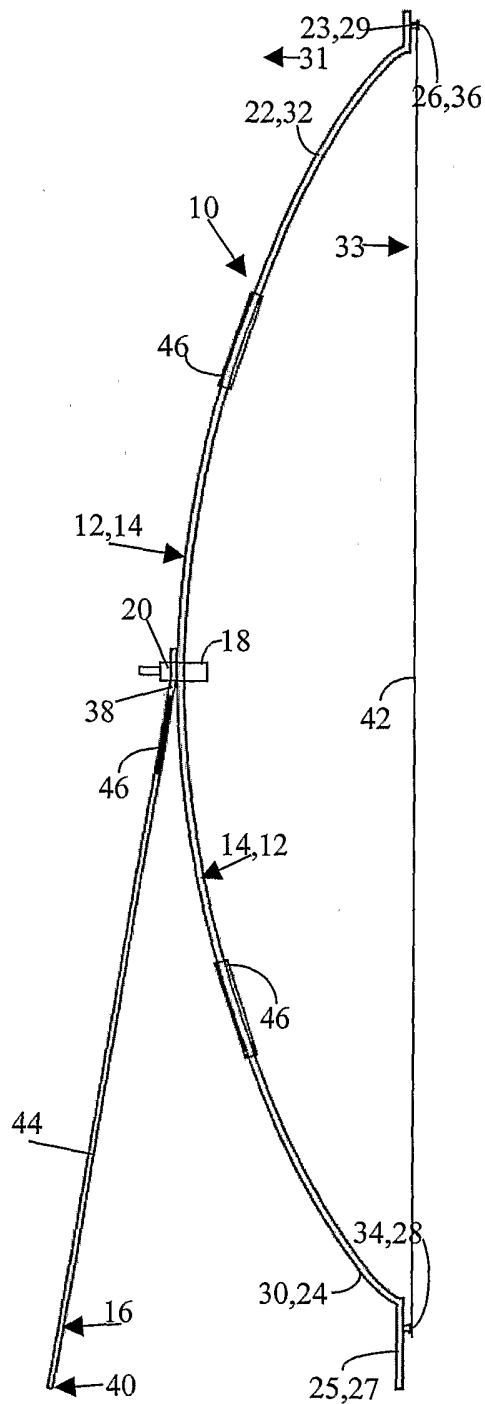


FIGURE 4

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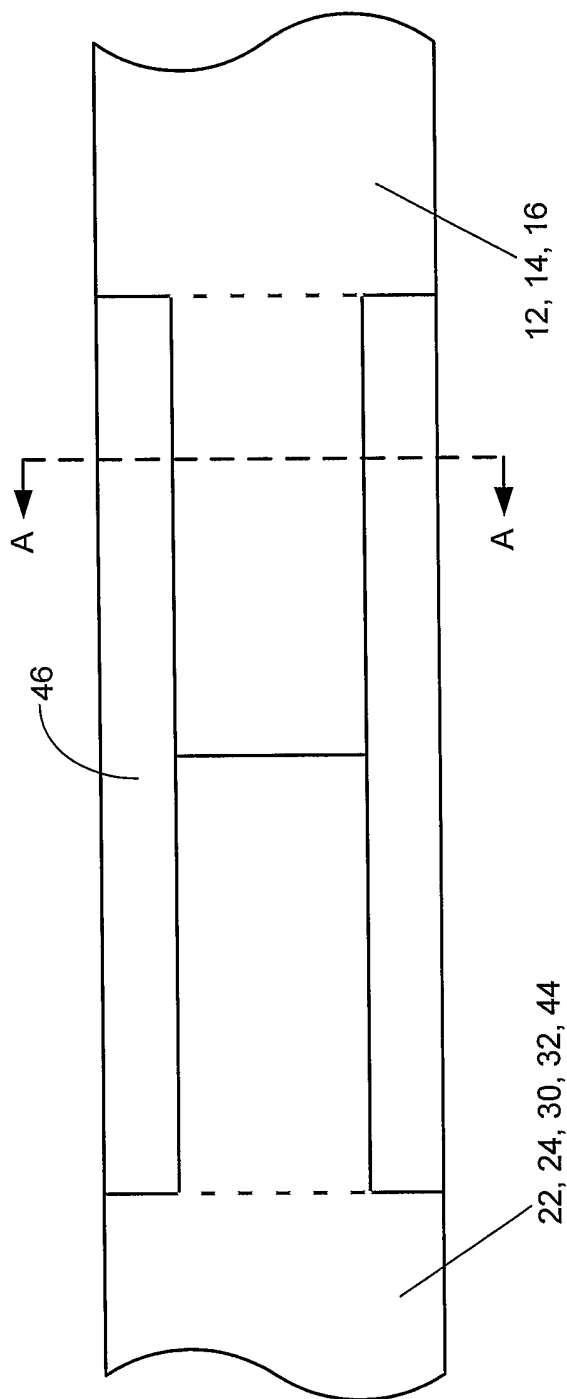


FIGURE 5



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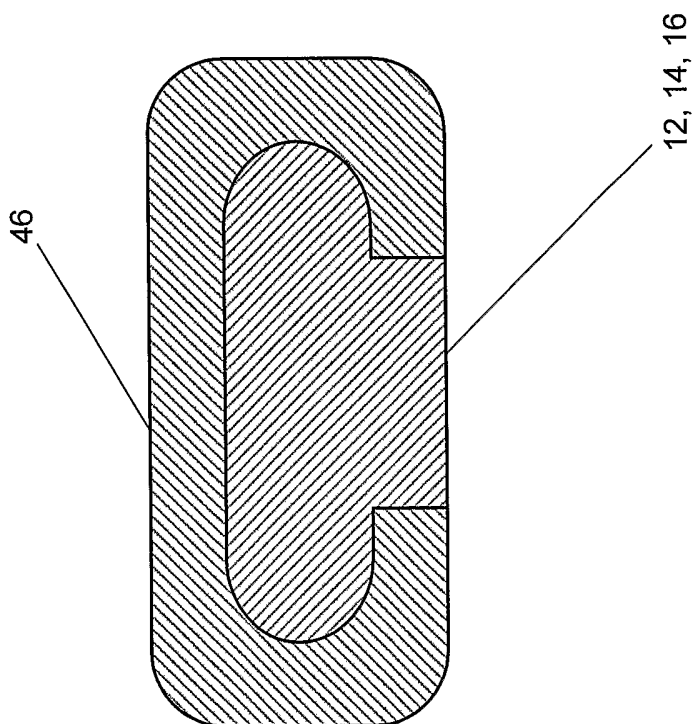


FIGURE 6

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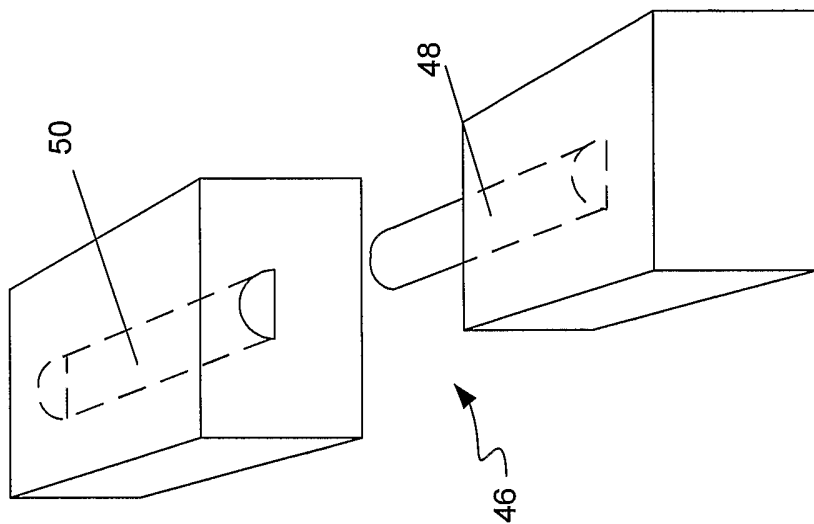


FIGURE 8

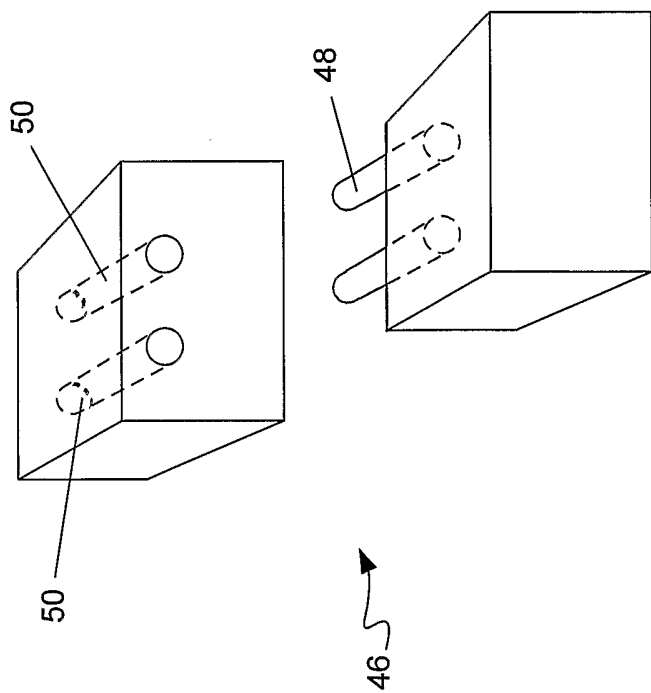


FIGURE 7

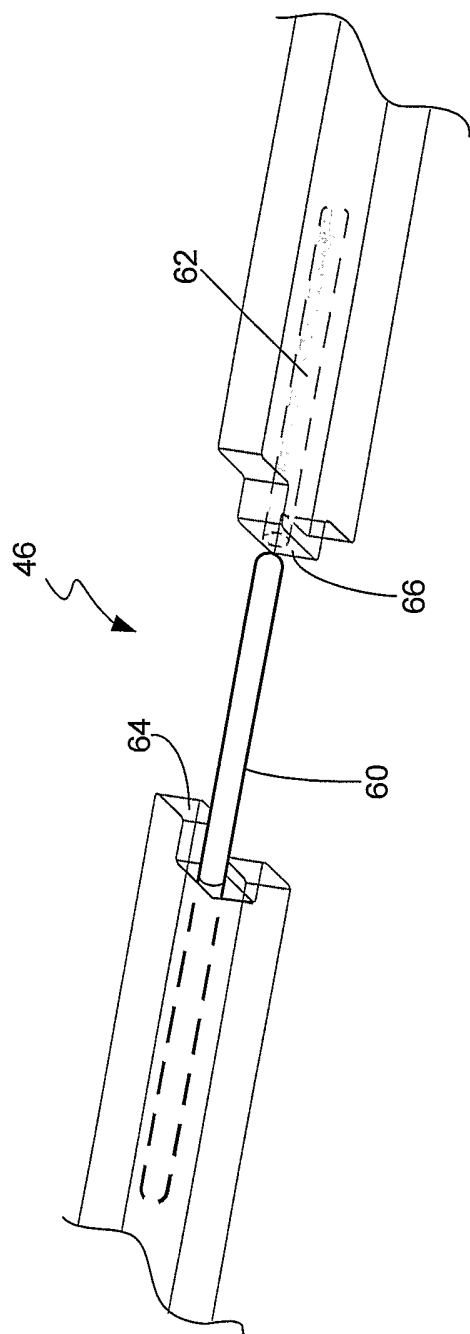


Figure 9

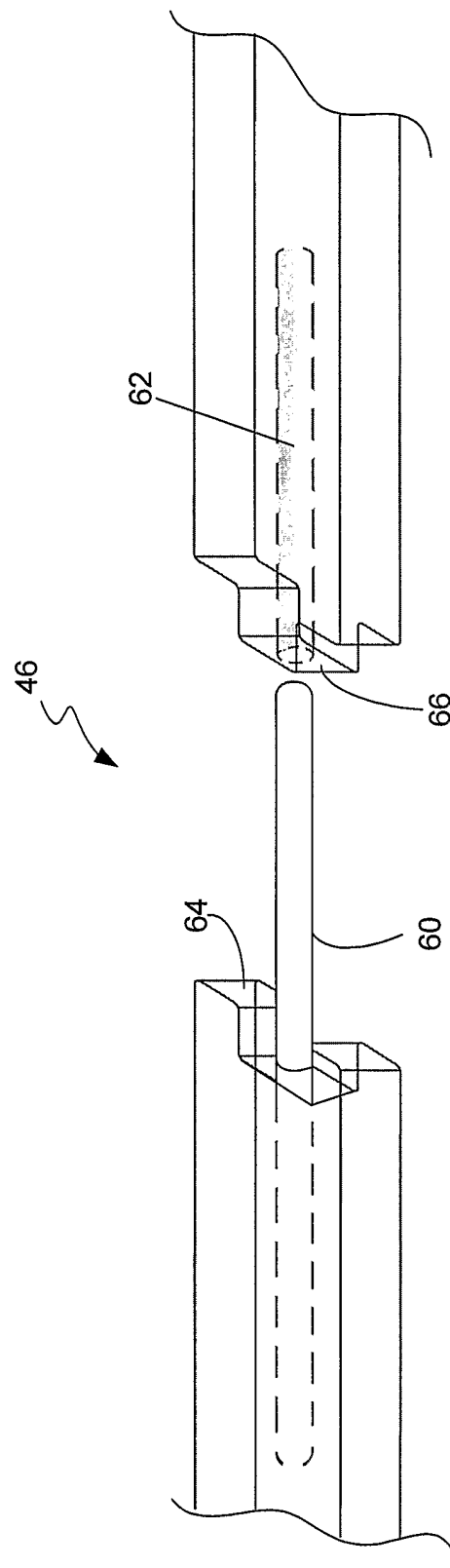


Figure 10

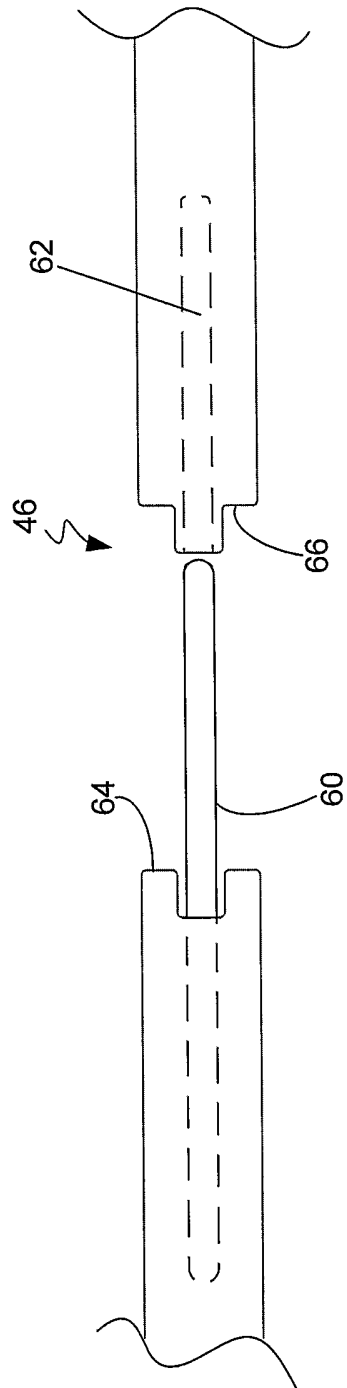


FIGURE 11

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU03/01195

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
Int. Cl. <sup>7</sup> : G09F 17/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) wpat: banner,flag,sign,support,mount,member,axis,resilient and similar terms		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,012,688 A (LaMotte) 11 January 2000 whole document	1-11
X	US 5,983,545 A (Marco) 16 November 1999 whole document	1-11
X	US Design 390,879 (Justen et al) 17 February 1998 whole document	1-11
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 25 September 2003		Date of mailing of the international search report 13 OCT 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer  <b>JAMES WILLIAMS</b> Telephone No : (02) 6283 2599

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/01195

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	US 6,606,809 B2 (Hillstrom et al) 19 August 2003 whole document	
A	US 2002/0121036 A1 (Dicke et al) 5 September 2002 whole document	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

**PCT/AU03/01195**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	6012688	AU	52406/98	CA	2300206	EP	944798
		US	5839705	WO	9819100	US	2001015399
		US	6454227				
US	5983545	AU	73036/96	EP	768634	FR	2739711
		IL	123991	NZ	320320	WO	9714132
US	6606809	CA	2397249	US	2003033743		
US	2002/0121036	CA	977265	DE	2101099	FR	2076060
		US	3673026				
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