



Office de la Propriété
Intellectuelle
du Canada

Un organisme
d'Industrie Canada

Canadian
Intellectual Property
Office

An agency of
Industry Canada

CA 2785546 C 2014/07/08

(11)(21) **2 785 546**

(12) **BREVET CANADIEN
CANADIAN PATENT**

(13) **C**

(22) Date de dépôt/Filing Date: 2012/08/10

(41) Mise à la disp. pub./Open to Public Insp.: 2014/02/10

(45) Date de délivrance/Issue Date: 2014/07/08

(51) Cl.Int./Int.Cl. *F16C 11/04* (2006.01),
B25B 7/08 (2006.01), *F16B 5/02* (2006.01),
F16C 43/02 (2006.01)

(72) Inventeur/Inventor:
LEE, YU CHIEH, TW

(73) Propriétaire/Owner:
LEE, YU CHIEH, TW

(74) Agent: MACRAE & CO.

(54) Titre : ARTICULATION A CISEAUX

(54) Title: SCISSOR LINKAGE

(57) **Abrégé/Abstract:**

A scissor linkage includes two links and a pivot shaft. The two links respectively have a reinforcing sleeve fitted around a middle area thereof, and the pivot shaft is extended through the two links and the two reinforcing sleeves and locked thereto. With the reinforcing sleeves fitted around the middle areas thereof, the two links have increased strength and can be conveniently connected to each other. The facing sides of the two reinforcing sleeves are wear-resistant to prolong the service life of the links, and have low friction between them to enable easy stretching or folding of the scissor linkage. Therefore, the scissor linkage advantageously has extended service life, provides high connection strength, and is conveniently stretchable and foldable.



ABSTRACT OF THE DISCLOSURE

A scissor linkage includes two links and a pivot shaft. The two links respectively have a reinforcing sleeve fitted around a middle area thereof, and the pivot shaft is extended through the two links and the two reinforcing sleeves and locked thereto. With the reinforcing sleeves fitted around the middle areas thereof, the two links have increased strength and can be conveniently connected to each other. The facing sides of the two reinforcing sleeves are wear-resistant to prolong the service life of the links, and have low friction between them to enable easy stretching or folding of the scissor linkage. Therefore, the scissor linkage advantageously has extended service life, provides high connection strength, and is conveniently stretchable and foldable.

SCISSOR LINKAGE

FIELD OF THE INVENTION

The present invention relates to a scissor linkage.

BACKGROUND OF THE INVENTION

A conventional scissor linkage includes two links and a pivot shaft. The two links are respectively provided at two opposite ends with a pivot hole each. The pivot shaft is extended through and riveted to the two links, so that the two links cross each other to form a foldable scissor linkage. The conventional scissor linkage is easily worn out at the contact areas of the two links, and the pivot shaft tends to become damaged at the riveted point to shorten the service life of the scissor linkage. Further, there is a high frictional force between the two links, preventing the scissor linkage from being conveniently stretched or folded.

SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to overcome the above-mentioned drawbacks of the conventional scissor linkage by providing an improved scissor linkage that has extended service life and can be conveniently stretched or folded.

The scissor linkage according to the present invention for solving the problems in the conventional scissor linkage includes two links and a pivot shaft. The two links

respectively have a reinforcing sleeve fitted around a middle area thereof, and the pivot shaft is extended through the two links and the two reinforcing sleeves and locked thereto. With the reinforcing sleeves fitted around the middle areas thereof, the two links have increased strength and can be conveniently connected to each other. The facing sides of the two reinforcing sleeves are wear-resistant to prolong the service life of the links, and have low friction between them to enable easy stretching or folding of the scissor linkage.

The reinforcing sleeves respectively internally define a longitudinal bore that matches the two links, such that the reinforcing sleeves would not loosen from or slide relative to the links, and can increase the connection strength between the two links.

At least one of the two reinforcing sleeves is provided on one side facing toward the other reinforcing sleeve with a raised wear-resistant and low-friction layer, so as to protect the reinforcing sleeves against easy wear and reduce the frictional contact area and the coefficient of friction between the two links, enabling the scissor linkage to have prolonged service life and be conveniently stretched or folded.

The pivot shaft includes a bolt and a matching nut. The bolt has an externally threaded shank extended through the two links and the two reinforcing sleeves to engage with the nut. The engaged bolt and nut together constitute the pivot shaft that can be held to the reinforcing sleeves and the links without the problems of becoming damaged easily or having short service life as found with the riveted scissor linkage.

The first one of the two reinforcing sleeves is provided on an outer side facing away from the second reinforcing sleeve with an outward protruded first locating seat. The

first locating seat internally defines a rotation-limiting slot matching the nut, and the nut is non-rotatably received in the rotation-limiting slot. With the nut non-rotatably received in the rotation-limiting slot, the two links can be easily assembled or disassembled, and it is able to effectively prevent the condition of self-loosening of the bolt from the nut. Meanwhile, the nut is not exposed from the reinforcing sleeve to ensure a beautiful appearance of the scissor linkage while eliminating the risk of scratching a user or the user's clothes by the nut.

The second reinforcing sleeve is provided on an outer side facing away from the first reinforcing sleeve with an outward protruded second locating seat. The second locating seat internally defines a round slot matching a head of the bolt, and the bolt head is rotatably received in the round slot. With the bolt head rotatably received in the round slot, the two links can be easily assembled, and it is able to prevent the bolt head from projecting out of the reinforcing sleeve to ensure a beautiful appearance of the scissor linkage while eliminating the risk of scratching a user or the user's clothes by the bolt head.

Further, the two links all are provided at two opposite ends with a pivot hole each.

With the above arrangements, the scissor linkage according to the present invention provides the advantages of having prolonged service life, being easily stretchable and foldable, and ensuring enhanced connection strength.

BRIEF DESCRIPTION OF THE DRAWINGS

The structure and the technical means adopted by the present invention to achieve the

above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

Fig. 1 is a perspective view of a scissor linkage according to the present invention;

Fig. 2 is an enlarged view of the circled area A of Fig. 1;

Fig. 3 is an exploded view of Fig. 2; and

Fig. 4 shows an example of application of the scissor linkage of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to Figs. 1, 2 and 3. A scissor linkage according to an embodiment of the present invention includes a first link 1, a second link 2, a first reinforcing sleeve 3, a second reinforcing sleeve 4, a bolt, and a nut.

As can be seen from Fig. 1, the first link 1 is provided at two opposite ends with a pivot hole each, and in a middle area with a first transverse through hole 11. The second link 2 is also provided at two opposite ends with a pivot hole each, and in a middle area with a second transverse through hole 21.

As can be seen from Fig. 3, the first reinforcing sleeve 3 internally defines a longitudinal bore that matches the first link 1. A raised wear-resistant and low-friction layer 31 is formed on a right side of the first reinforcing sleeve 3; and an outward protruded first locating seat 32 is formed on a left side of the first reinforcing sleeve 3.

The first locating seat 32 internally defines a rotation-limiting slot 321. The first reinforcing sleeve 3 is also provided in a middle area with a third transverse through hole, which is located at a position corresponding to the rotation-limiting slot 321. The first reinforcing sleeve 3 is fitted around the middle area of the first link 1, such that the first transverse through hole 11 is coaxial with the third transverse through hole.

As can be seen from Fig. 3, the second reinforcing sleeve 4 internally defines a longitudinal bore that matches the second link 2. A raised wear-resistant and low-friction layer 41 is formed on a left side of the second reinforcing sleeve 4; and an outward protruded second locating seat 42 is formed on a right side of the second reinforcing sleeve 4. The second locating seat 42 internally defines a round slot. The second reinforcing sleeve 4 is also provided in a middle area with a fourth transverse through hole, which is located at a position corresponding to the round slot. The second reinforcing sleeve 4 is fitted around the middle area of the second link 2, such that the second transverse through hole 21 is coaxial with the fourth transverse through hole.

The first transverse through hole 11, the third transverse through hole, the second transverse through hole 21, and the fourth transverse through hole have the same inner diameter matching an outer diameter of the bolt.

The nut is non-rotatably received in the rotation-limiting slot 321 while the bolt has a head rotatably received in the round slot. The bolt has an externally threaded shank being sequentially extended through the round slot and the fourth transverse through hole of the second reinforcing sleeve 4, the second transverse through hole 21, the third

transverse through hole, and the first transverse through hole 11 to engage with the nut.

Fig. 4 shows an example of application of the scissor linkage according to the present invention in a foldable tent. The foldable tent includes four posts 5, four sets of foldable connection devices 6, and a foldable roof frame 7.

The posts 5 are telescopic posts and respectively have a fixed joint provided on an upper end thereof, and a slidable joint movably fitted therearound. Each of the slidable joints is provided with a locking member, with which the slidable joint can be locked to a position relative to a corresponding post. When the locking member is unlocked, the slidable joint is allowed to slide upward and downward along the post.

Any two adjacent posts 5 have one set of the foldable connection device 6 connected to between them. Each set of the foldable connection device 6 includes three scissor linkages. Two end portions at one side of the first scissor linkage are separately pivotally connected to the fixed joint and the slidable joint on one of the two adjacent posts 5. Two end portions at one side of the second scissor linkage are separately pivotally connected to two end portions at another side of the first scissor linkage. Two end portions at one side of the third scissor linkage are separately pivotally connected to two end portions at another side of the second scissor linkage, while two end portions at another side of the third scissor linkage are separately pivotally connected to the fixed and the slidable joint on the other one of the two adjacent posts.

The foldable roof frame 7 includes a top member, four sets of struts, and four stretchers. Each set of struts includes an upper strut and a lower strut. The upper strut has an upper end pivotally connected to the top member and a lower end pivotally connected to

an upper end of the lower strut. The lower strut is pivotally connected at a lower end to the fixed joint on one of the four posts. Each of the stretchers has a lower end pivotally connected to the slidable joint on a corresponding post, and an upper end pivotally connected to a corresponding lower strut.

The present invention has been described with a preferred embodiment thereof and it is understood that many changes and modifications in the described embodiment can be carried out without departing from the scope and the spirit of the invention that is intended to be limited only by the appended claims.

What is claimed is:

1. A scissor linkage comprising two links and a pivot shaft, being characterized in that the two links respectively have a reinforcing sleeve fitted around a middle area thereof, and that the pivot shaft is extended through the two links and the two reinforcing sleeves and locked thereto.
2. The scissor linkage as claimed in claim 1, wherein the reinforcing sleeves respectively internally define a longitudinal bore that matches the two links.
3. The scissor linkage as claimed in claim 1, wherein at least one of the two reinforcing sleeves is provided on one side facing toward the other reinforcing sleeve with a raised wear-resistant and low-friction layer.
4. The scissor linkage as claimed in claim 1, wherein the pivot shaft includes a bolt and a matching nut; and the bolt having an externally threaded shank extended through the two links and the two reinforcing sleeves to engage with the nut.
5. The scissor linkage as claimed in claim 4, wherein the first one of the two reinforcing sleeves is provided on an outer side facing away from the second reinforcing sleeve with an outward protruded first locating seat; the first locating seat internally defining a rotation-limiting slot matching the nut, and the nut being non-rotatably received in the rotation-limiting slot.

6. The scissor linkage as claimed in claim 5, wherein the second reinforcing sleeve is provided on an outer side facing away from the first reinforcing sleeve with an outward protruded second locating seat; the second locating seat internally defining a round slot matching a head of the bolt, and the bolt head being rotatably received in the round slot.
7. The scissor linkage as claimed in claim 1, wherein the two links are respectively provided on two opposite ends with a pivot hole each.

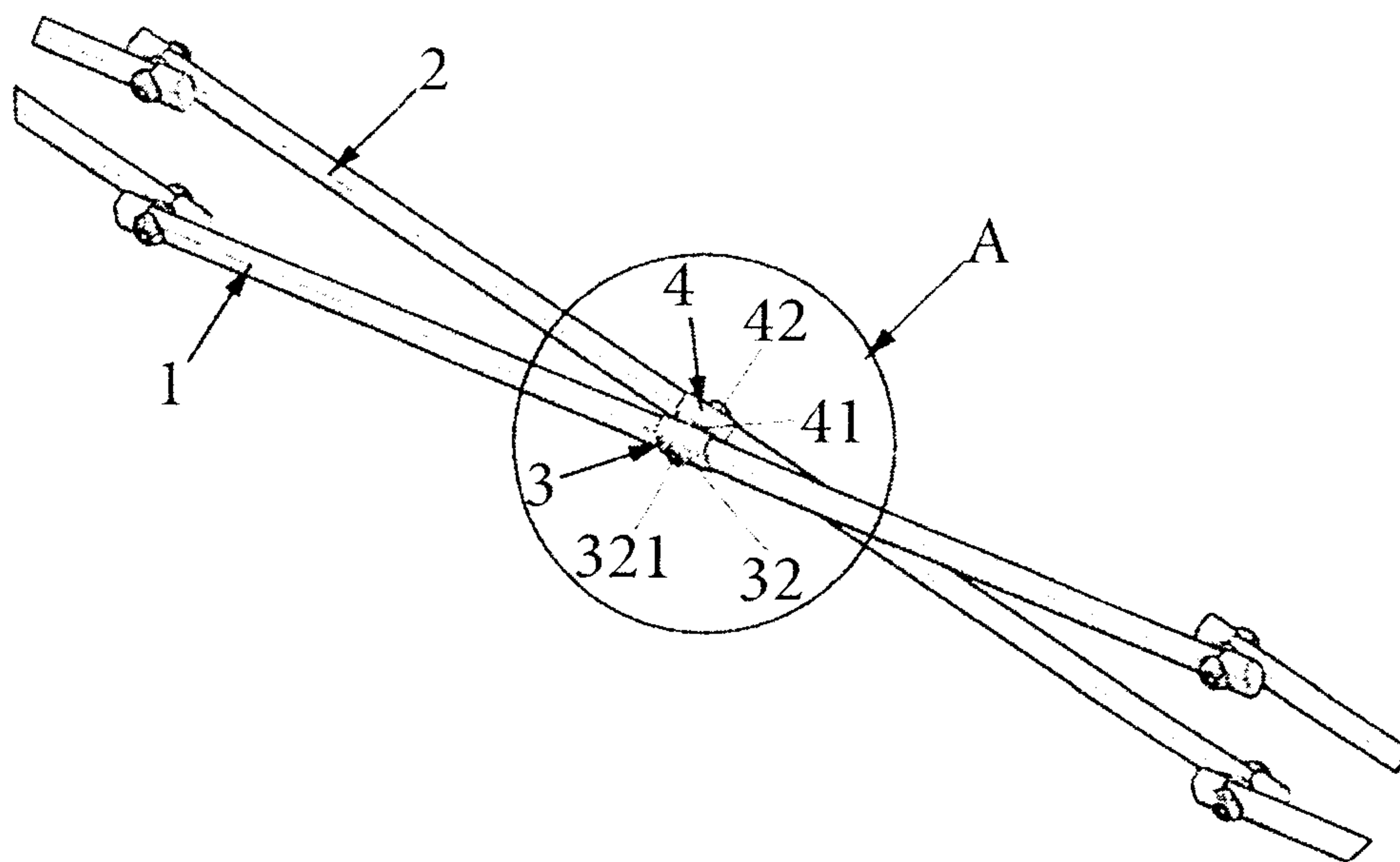


FIG. 1

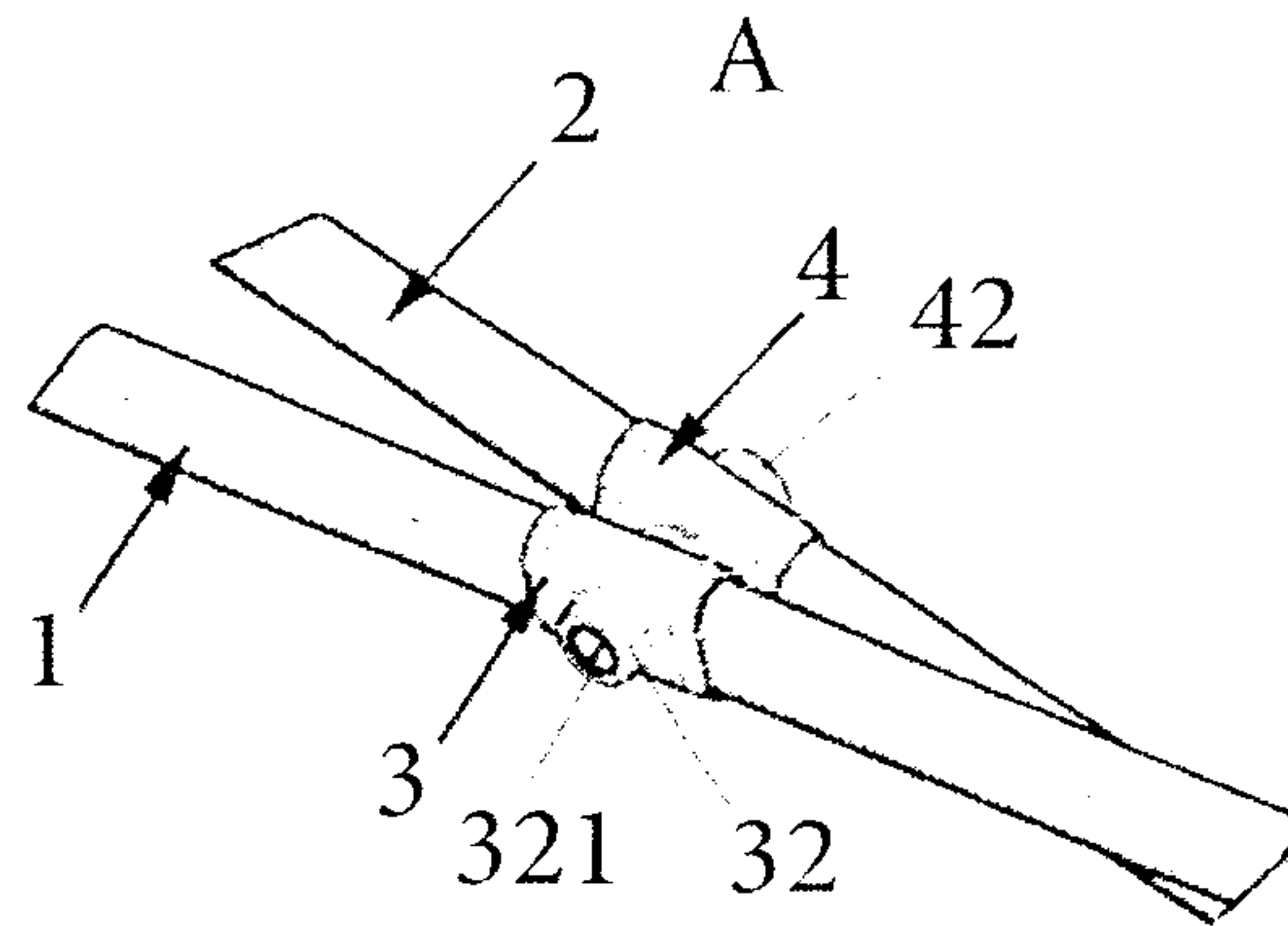


FIG. 2

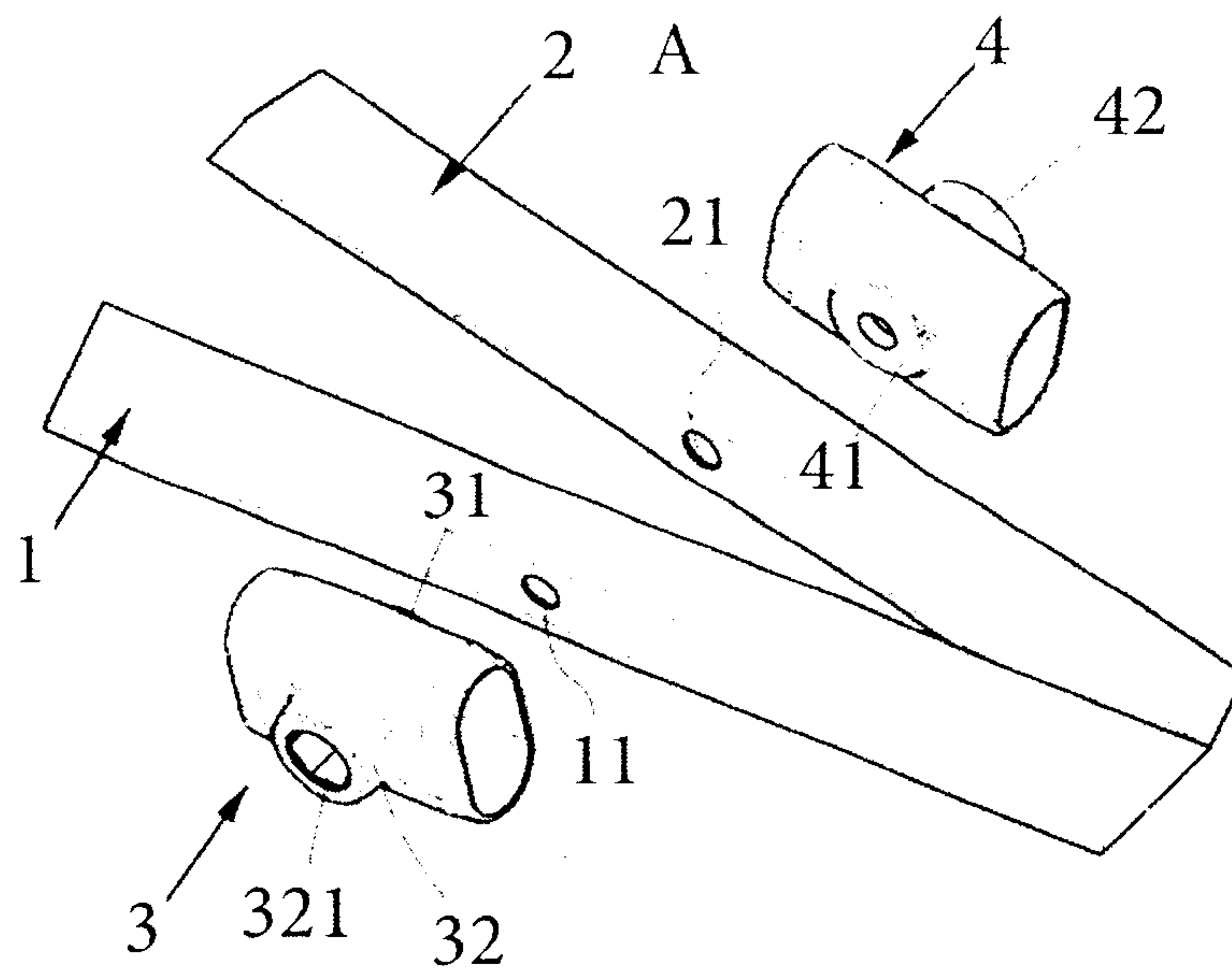


FIG. 3

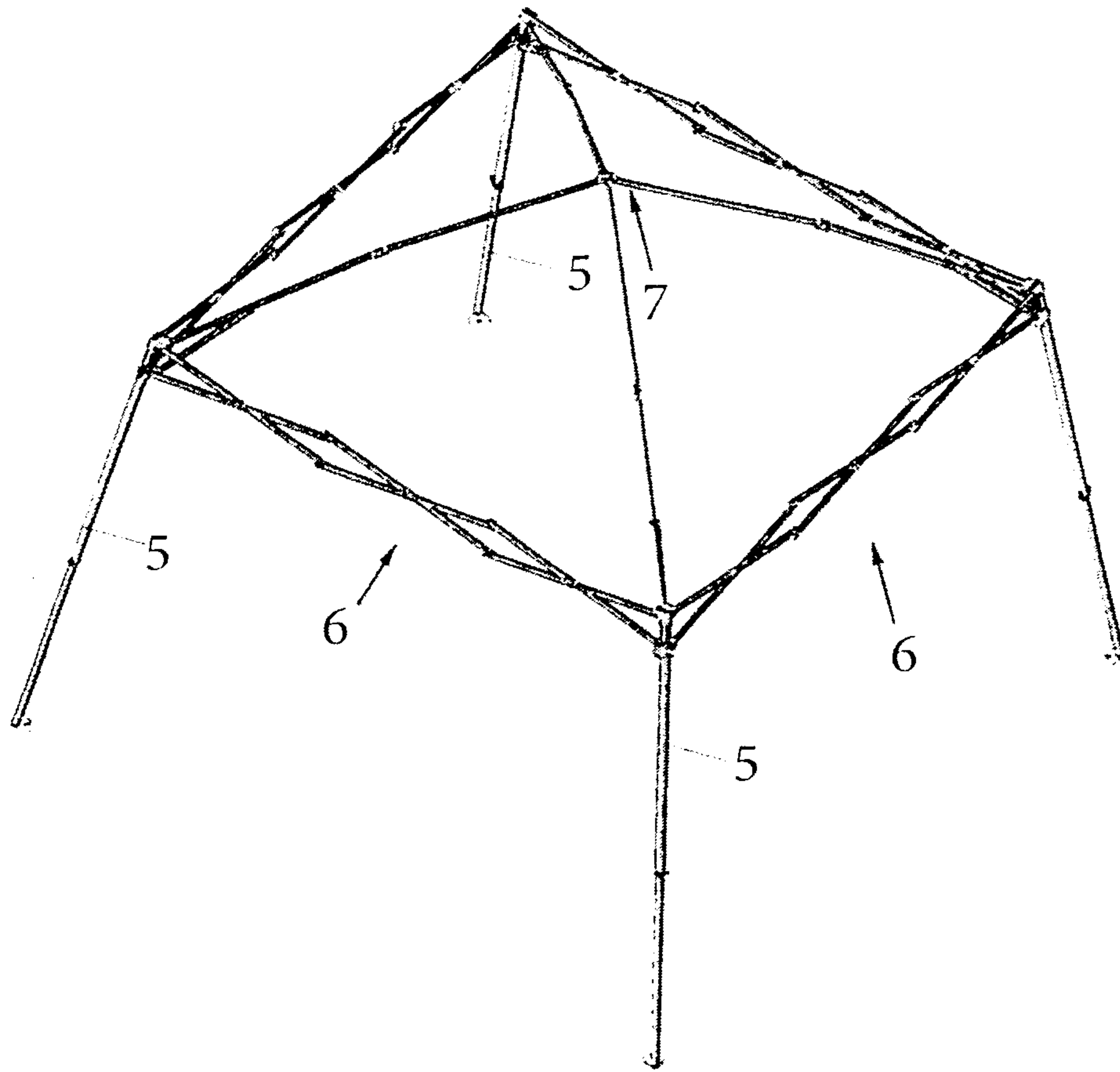


FIG. 4