



(22) Date de dépôt/Filing Date: 2007/05/17

(41) Mise à la disp. pub./Open to Public Insp.: 2007/12/01

(45) Date de délivrance/Issue Date: 2009/10/27

(30) Priorité/Priority: 2006/06/01 (DE10 2006 026 055.4)

(51) Cl.Int./Int.Cl. *A47C 7/38* (2006.01),
A61G 5/12 (2006.01)

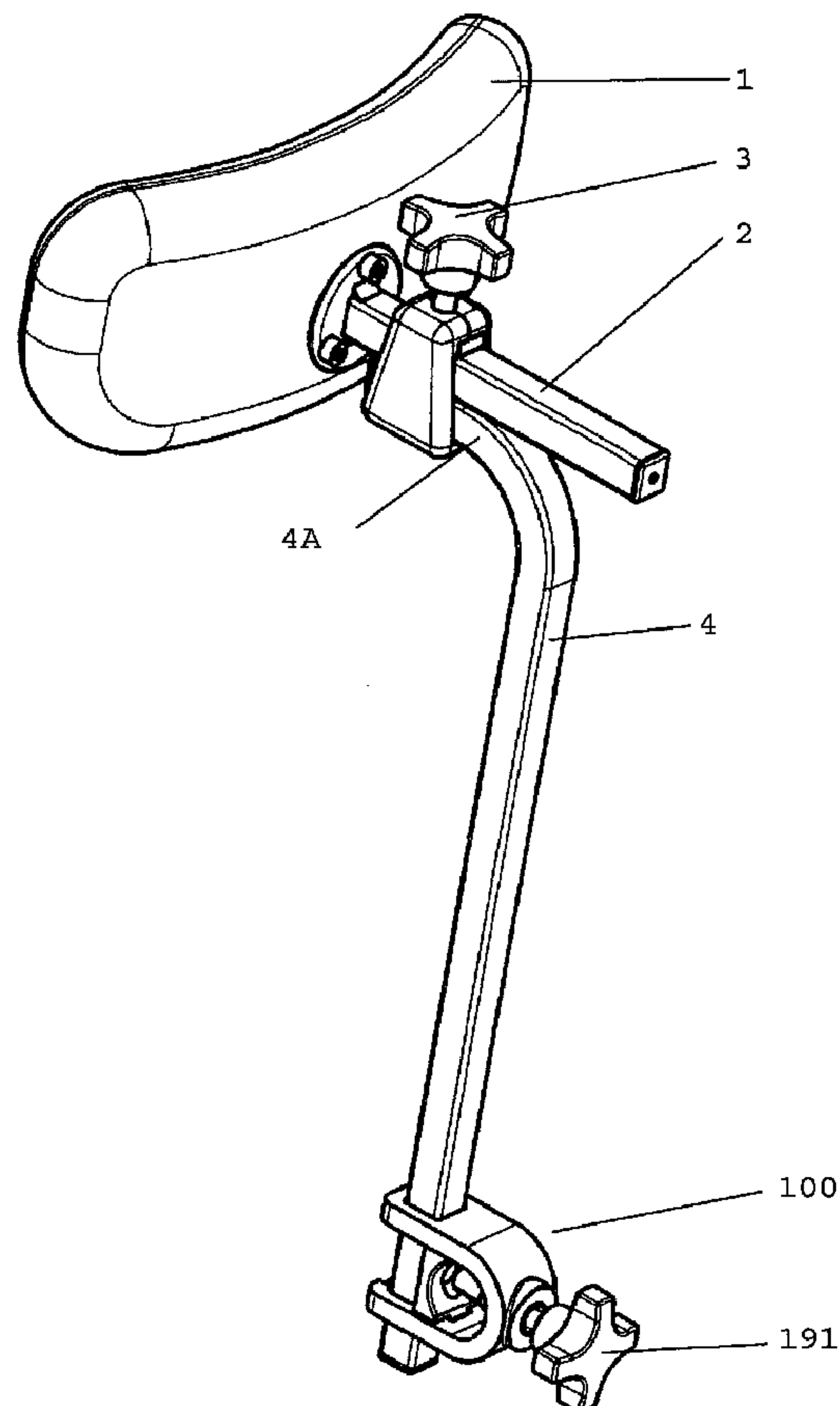
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(54) Titre : APPUIE-TETE A HAUTEUR REGLABLE

(54) Title: HEIGHT ADJUSTABLE HEADREST DEVICE



(57) Abrégé/Abstract:

The invention relates to a height adjustable headrest device with a crossbar element and a headrest supporting element as well as a clamp connection for continuously variable mounting of the headrest element at the crossbar element. The clamp connection

(57) **Abrégé(suite)/Abstract(continued):**

comprises a retaining clamp comprising two recesses as well as a tapped bore and gripping around a crossbar element, a centering bushing comprising an external thread and an internal thread, the centering bushing being screwed into the tapped bore of the retaining clamp, as well as a screw element screwed in the centering bushing. The headrest supporting element is inserted in the recesses of the retaining clamp. The crossbar element comprises a bore in which the centering bushing is inserted. The clamp connection is caused by screwing the screw element into the centering bushing and thus bringing the headrest supporting element near the crossbar element. Preferably, the sense of rotation of the internal thread of the centering bushing is opposed to that of the external thread.

Abstract

The invention relates to a height adjustable headrest device with a crossbar element and a
5 headrest supporting element as well as a clamp connection for continuously variable
mounting of the headrest element at the crossbar element. The clamp connection comprises a
retaining clamp comprising two recesses as well as a tapped bore and gripping around a
crossbar element, a centering bushing comprising an external thread and an internal thread,
the centering bushing being screwed into the tapped bore of the retaining clamp, as well as a
10 screw element screwed in the centering bushing. The headrest supporting element is inserted
in the recesses of the retaining clamp. The crossbar element comprises a bore in which the
centering bushing is inserted. The clamp connection is caused by screwing the screw element
into the centering bushing and thus bringing the headrest supporting element near the
crossbar element. Preferably, the sense of rotation of the internal thread of the centering
15 bushing is opposed to that of the external thread.

HEIGHT ADJUSTABLE HEADREST DEVICE

Field of the Invention

The invention relates to a height adjustable headrest device as well as a wheel chair with such
5 a height adjustable headrest device.

Background of the Invention

Height adjustable headrest devices are known in the prior art. They are used, among others,
with seats in the medical field as well as in the field of care, for example also in wheel chairs.
A shower and toilet wheel chair with a height adjustable headrest is distributed under the
10 product name OCEAN VIP™ by AQUATEC GmbH, Alemannenstr. 10, 88316 Isny,
Germany.

The height adjustable headrest device of this known shower and toilet wheel chair will be
described below in connection with certain Figures included within this specification. It is to
15 be understood that the representations in the figures of this application are not drawn to scale.
For a better representation of certain details, the representation of some components is
enlarged and simplified.

Summary of the Invention

20 One of the objects underlying the invention is to further improve the known height adjustable
headrest device, in particular with respect to function and operating safety.

The invention provides a height adjustable headrest device with a crossbar element and a
headrest supporting element as well as a clamp connection for the continuously variable
25 mounting of the headrest supporting element at the crossbar element, wherein the clamp
connection comprises a retaining clamp comprising two recesses as well as a tapped bore, the
retaining clamp gripping around the crossbar element, a centering bushing comprising an
external thread and an internal thread, the centering bushing being screwed into the tapped
bore of the retaining clamp, and a screw element screwed into the centering bushing, wherein
30 the headrest supporting element is inserted in the recesses of the retaining clamp, the crossbar
element comprises a bore into which the centering bushing is inserted, and the clamp

connection is effected by screwing in the screw element into the centering bushing and thus bringing the headrest supporting element near the crossbar element.

5 The height adjustable headrest device according to the invention thus differs from the known height adjustable headrest device illustrated above in the design of the clamp connection, that is in that a centering bushing is provided which comprises an external thread and an internal thread. The centering bushing is screwed into the tapped bore of the retaining clamp with its external thread. With a cylindrical centering section, the centering bushing is inserted in a correspondingly designed bore of the crossbar element. The screw element is screwed with
10 the clamp connection by means of the internal thread of the centering bushing.

By the provision of the centering bushing, a particularly exact holding and fixing of the components with respect to one another is ensured.

15 In a preferred embodiment of the invention, the sense of rotation of the internal thread of the centering bushing is opposed to that of the external thread of the centering bushing. If, for example, the internal thread is designed as left-handed thread, the external thread is designed as right-handed thread. This prevents the threaded bushing from being screwed out of the retaining clamp when the screw element is unintentionally actuated.

20

Preferably, a spacer is arranged between the headrest supporting element and the crossbar element and held via a groove and tongue connection in the retaining clamp in a preferred embodiment. The spacer is preferably made of plastics to ensure clamping as wear-resistant and backlash-free as possible.

25

The crossbar element preferably has a tubular design. In the crossbar element, opposite the bore for receiving the centering bushing, preferably a bulging which is concave to the inside is provided which acts as abutment for the screw element.

30

The headrest supporting element and the corresponding recesses of the retaining clamp preferably have a rectangular design. It is to be understood that other shapes, for example circular or other rounded geometries, are also possible.

A wheel chair according to the invention with a height adjustable headrest device according to the present invention is preferably designed such that the crossbar element is designed as push handle.

5 **In the Drawings**

The invention will be illustrated below with reference to a preferred embodiment and the enclosed drawings, wherein

10 **Fig. 1** is a perspective representation of a height adjustable headrest device according to the invention,

Fig. 2 is a schematic representation of the clamp connection wherein the crossbar element is omitted for better representation,

15 **Fig. 3** is an exploded drawing of a spacer, the centering bushing, the retaining clamp and the screw element,

Fig. 4 is a perspective representation of the centering bushing,

20 **Fig. 5** is a sectional representation of the centering bushing,

Fig. 6 is an axial plan view of the fixing bushing,

25 **Fig. 7** is a perspective representation of a known height adjustable headrest device corresponding to Fig. 1,

Fig. 8 is a partially sectional representation of a known embodiment of a clamp connection,

Fig. 9 is an enlarged perspective representation of a known retaining clamp,

30

Fig. 10 is a partially sectional side view of a known embodiment of a clamp connection, and

Fig. 11 is a perspective sectional representation of a crossbar element.

Detailed Description

Having regard to the prior art, **Fig. 7** shows a known height adjustable headrest device **200** in a perspective representation. The device comprises a headrest **201** which is fixed to a horizontal bar **202**. The headrest can be shifted horizontally by releasing a clamping device **203** whereby the horizontal bar **202** can be shifted along the shorter shank **204A** of a headrest supporting element **204** designed in the shape of a J.

The headrest supporting element **204** is fixed to a crossbar element **210** by means of a clamp connection **300**. The crossbar element **210** can, for example, be the central part of a push handle of a wheel chair.

The clamp connection **300** is shown in **Fig. 8** in a perspective representation and in **Fig. 10** in a side view, in each case partially cut open, where in each case only a part of the headrest supporting element **204** as well as the crossbar element **210** is shown.

The clamp connection **300** comprises a U-shaped retaining clamp **360** having two rectangular recesses **361A**, **361B**, through which the headrest supporting element **204**, which also has a rectangular design, can be inserted. The internal radius of the retaining clamp **360** having a U-shaped design is dimensioned such that it is adapted to the outside diameter of the crossbar element **210**. Between the crossbar element **210** and the headrest supporting element **204**, a spacer **370** is arranged which is held in the retaining clamp **360** by means of a groove and tongue connection so as to be shifted. The corresponding grooves **362A** and **362B** of the retaining clamp **360** are shown in **Fig. 9**.

A tapped bore **380** is provided in the retaining clamp **360** in which a screw element **390** is screwed in.

The screw element **390** is provided with a star handle (**391**) which permits manual release and tightening of the clamp connection **300**.

The function of the known clamp connection will be illustrated below. As is in particular represented in **Figures 8** and **10**, the retaining clamp **360** is placed around the crossbar

element **210** such that the tapped bore **380** is flush with a bore **211** provided in the crossbar element **210**. Opposite the bore **211**, a bulging **212** concave to the inner surface is provided in the crossbar element **210**.

5 The spacer **370** is inserted into the retaining clamp **360** and the headrest supporting element **204** is inserted through the recesses **361A**, **361B** of the retaining clamp **360**. The screw element **390** is screwed into the tapped bore **380** and in the process inserted through the bore **211** of the bar element **210** until it lies against the bulging **212**. When the screw element **390** is further screwed in, the retaining clamp **360** is moved to the right with respect to the bar
 10 element **210** in **Fig. 10**, which causes the headrest supporting element **204** to be pressed against the spacer **370** and the spacer **370** to be pressed against the crossbar element **210**. Thereby, a clamp connection is formed which provides secure positioning of the headrest supporting element **204** with respect to the crossbar element **210**.

15 If the screw element **390** is slightly screwed out of the retaining clamp **360**, the clamp connection is released and the headrest supporting element **204** can be shifted in the longitudinal direction with respect to the retaining clamp **360** and thus with respect to the crossbar element **210**. Thus, a continuously variable height adjustment of the headrest **201** is achieved.

20 A known prior art device has been described having regard to **Figures 7 to 11** as outlined above. As far as not described otherwise in the following, certain components or features of the known prior art device may be found in similar elements in the height adjustable headrest device according to the invention. Accordingly, in **Figures 1 to 6**, those components which correspond to the respective known components according to **Figures 7 to 11** are provided
 25 with reference numerals which are lower by the amount of 200 with respect to the respective corresponding reference numerals in **Figures 7 to 11**. Thus, for example, reference numeral **1** is assigned to the headrest in the embodiment of the invention according to **Fig. 1**, while reference numeral **201** is used for the headrest of the known embodiment according to **Fig. 7**.

30 The crossbar element **10** according to the present invention basically corresponds to that according to the prior art described in the beginning. Only the bore **11** has a different design in the crossbar element according to the invention, as will be illustrated below. In **Fig. 11**, for the sake of simplicity, therefore both reference numerals **210** are used for the crossbar

element according to the prior art, and reference numeral **10** for the crossbar element according to the invention. The same goes for the reference numerals **211** and **11** for the bore as well as reference numerals **212** and **12** for the bulging.

As described before, the clamp connection of the height adjustable headrest device according to the invention comprises a centering bushing **20**. In this respect, reference is made in particular to **Figures 2 to 5**. The centering bushing **20** comprises an external thread **22**, with which it can be screwed into the tapped bore **180** of the retaining clamp **160**. A collar **25** provided at the centering bushing **20** serves as contact face.

The centering bushing **20** moreover has a centering section **21** inserted in the bore **11** of the crossbar element **10**. It is to be understood that with the crossbar element **10** of the clamp connection of the height adjustable headrest device according to the invention, the bore **11** has to be designed such that it is adapted to the outside diameter of the centering section **21** of the centering bushing **20** as sliding fit. In the prior art illustrated in the beginning, the bore **211** is in contrast dimensioned such that the threaded portion of the screw element **390** can be passed through.

The screwing of the centering bushing **20** into the tapped bore **180** of the retaining clamp **160** is facilitated by a groove **26** in which a screwdriver can be set.

The centering bushing **20** moreover has an internal thread **23** the sense of rotation of which is opposed to that of the external thread **22**. If the external thread **22** is designed as right-handed thread, the internal thread **23** is designed as left-handed thread. Correspondingly, the internal thread **23** is designed as left-handed thread if the external thread **22** is designed as right-handed thread.

After the screwing of the threaded bushing **20** into the tapped bore **180** of the retaining clamp **160**, the same can be put over the crossbar element **10** such that the centering section **21** of the centering bushing **20** penetrates the bore **11** of the crossbar element **10**. The spacer **170** can then be inserted into the retaining clamp **160**, and subsequently the headrest supporting element **4** is passed through the recesses **161a**, **161b**. Finally, the screw element **190** is screwed into the centering bushing **20** by means of the star handle **191** until it lies against the

bulging **12** of the crossbar element **10**. If the screw element **190** is further screwed in, the headrest supporting element **4** is clamped with the crossbar element **10** via the spacer **170**.

The foregoing are examples of certain aspects of the present invention. Many other
5 embodiments, including modifications and variations thereof, are also possible and will
become apparent to those skilled in the art upon a review of the invention as described herein.
Accordingly, all suitable modifications, variations and equivalents may be resorted to, and
such modifications, variations and equivalents are intended to fall within the scope of the
invention as described herein and within the scope of the appended claims.

Patent Claims

1. A height adjustable headrest device with a crossbar element and a headrest supporting
5 element as well as a clamp connection for variable mounting of the headrest supporting
element along a range of selectable positions at the crossbar element, wherein the clamp
connection comprises:

a retaining clamp comprising two recesses as well as a tapped bore, the retaining clamp
10 gripping around the crossbar element,

a centering bushing comprising an external thread and an internal thread, wherein the
centering bushing is screwed in the tapped bore of the retaining clamp, and

15 a screw element screwed in the centering bushing,

wherein the headrest supporting element is inserted in the recesses of the retaining clamp, the
crossbar element comprises a bore in which the centering bushing is inserted, and the clamp
connection is caused by screwing in of the screw element into the centering bushing and thus
20 bringing the headrest supporting element near the crossbar element.

2. The device according to claim 1, characterized in that the sense of rotation of the
internal thread is opposed to that of the external thread.

25 3. The device according to claim 1 or 2, characterized in that the centering bushing
comprises a collar which provides a stop when it is screwed in.

4. The device according to any one of claims 1 to 3, characterized in that the centering
bushing comprises a groove which is designed for setting a screwdriver.

30 5. The device according to any one of claims 1 to 4, characterized in that a spacer is
arranged between the headrest supporting element and the crossbar element.

6. The device according to claim 5, characterized in that the spacer is guided via a groove and tongue connection in the retaining clamp.
7. The device according to claim 5 or 6, characterized in that the spacer is made of plastics.
8. The device according to any one of claims 1 to 7, characterized in that the crossbar element has a tubular design.
9. The device according to claim 8, characterized in that a bulging which is concave to the inside which serves as abutment for the screw element is provided in the tubular crossbar element opposite the bore for receiving the centering bushing.
10. The device according to any one of claims 1 to 9, characterized in that the headrest supporting element and the recesses of the retaining clamp have a rectangular design.
11. A wheel chair with a height adjustable headrest device according to any one of claims 1 to 10, characterized in that the crossbar element is designed as a push handle.

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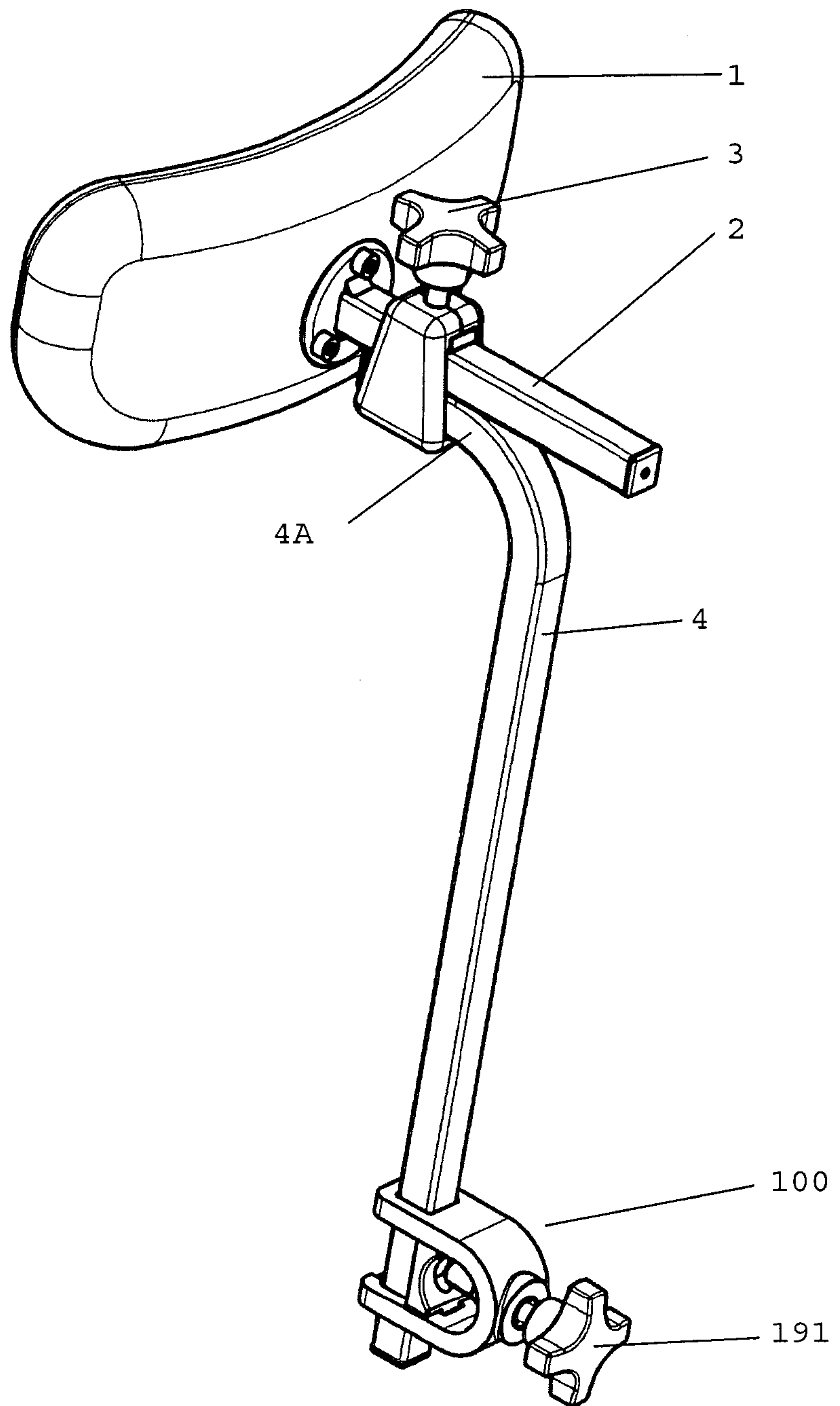


Fig. 1

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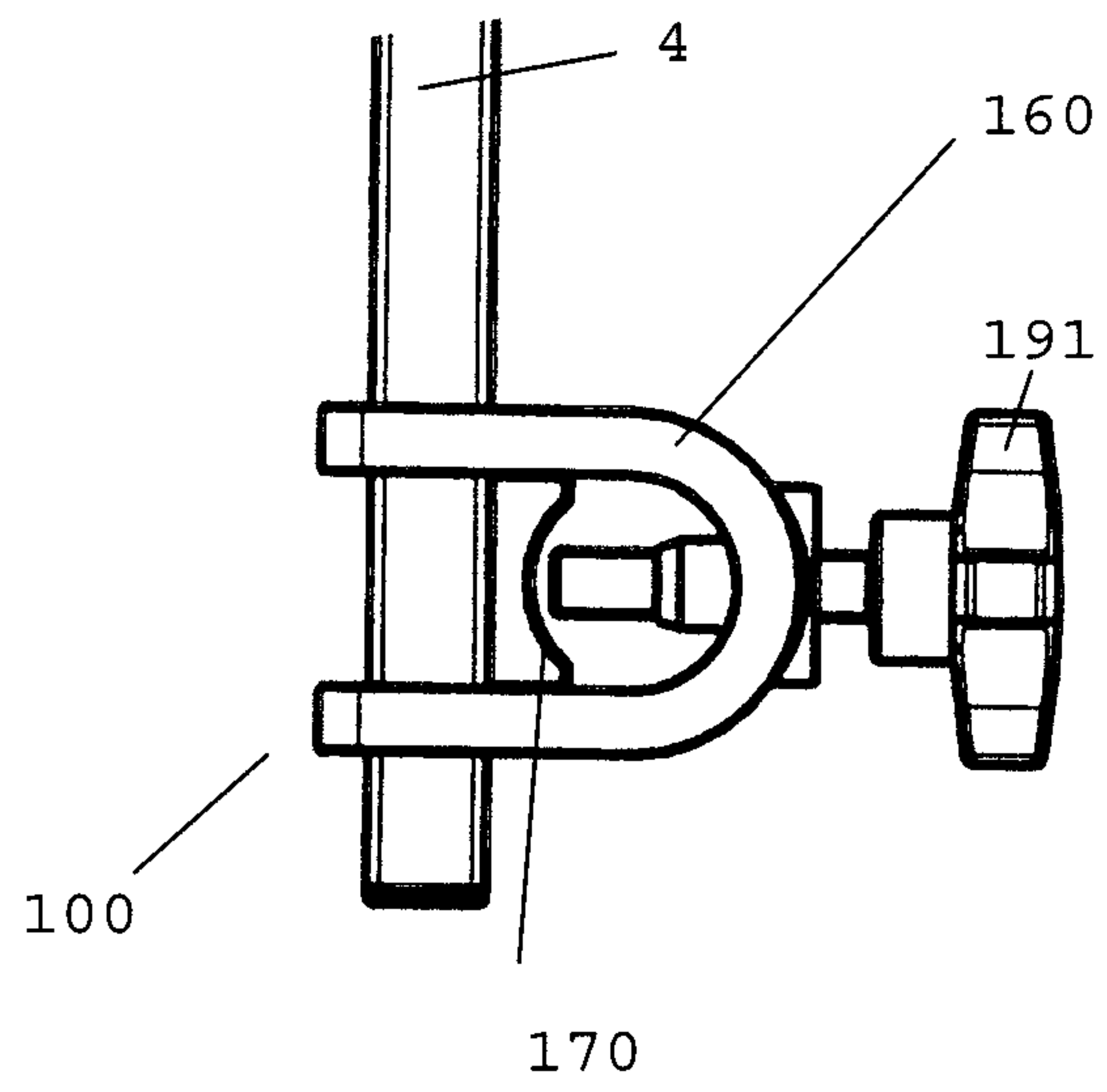


Fig. 2

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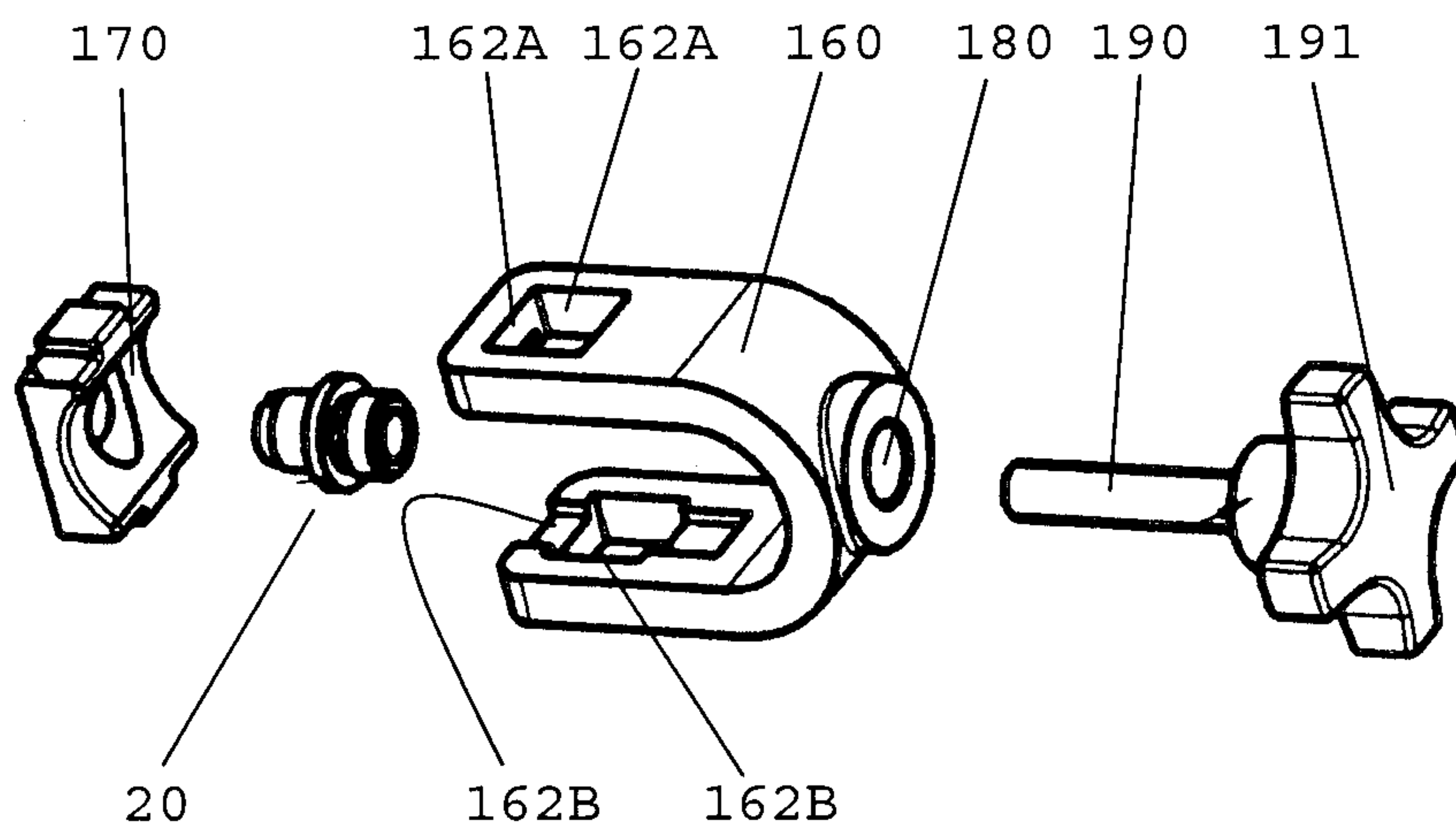


Fig. 3

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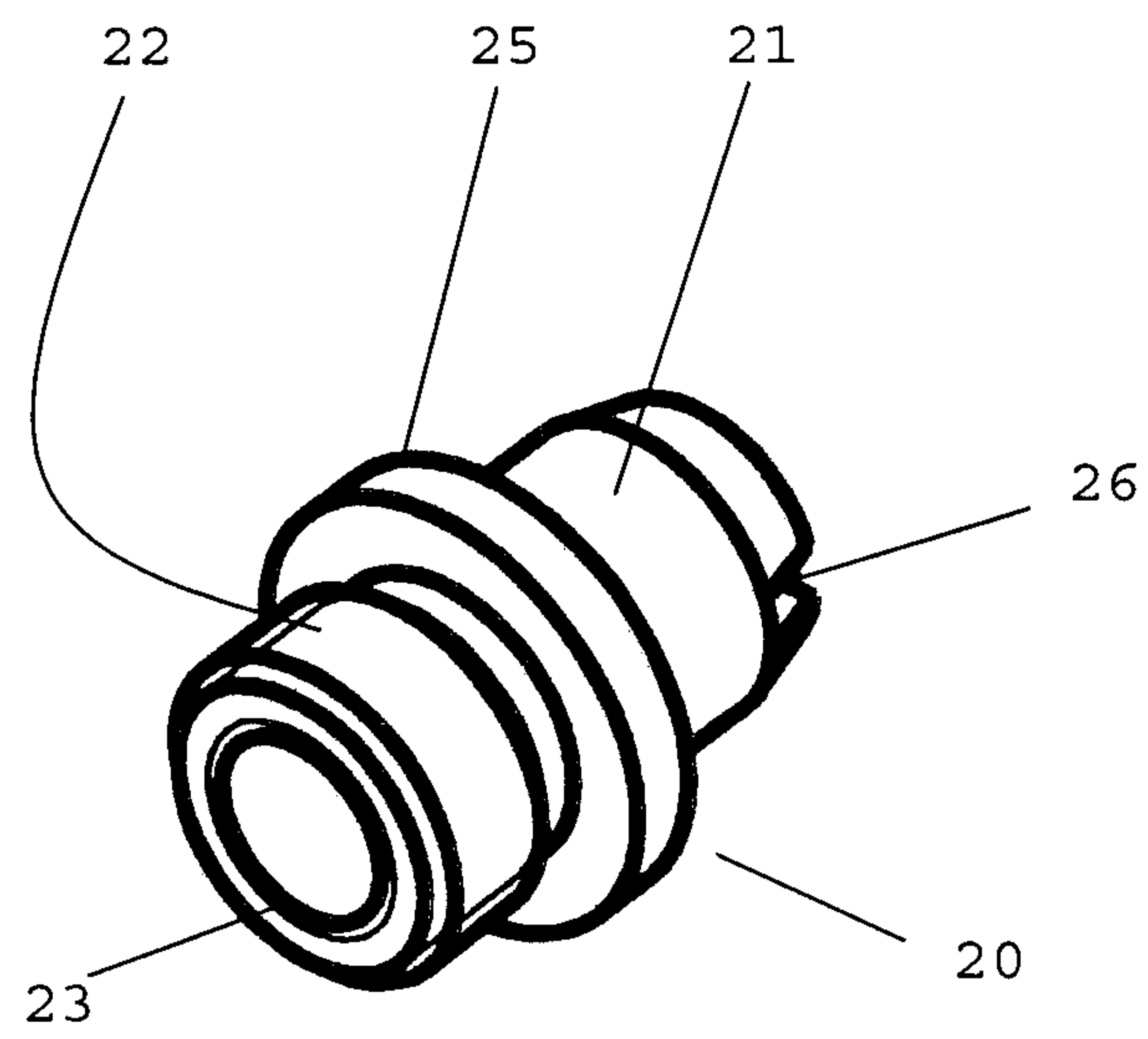


Fig. 4

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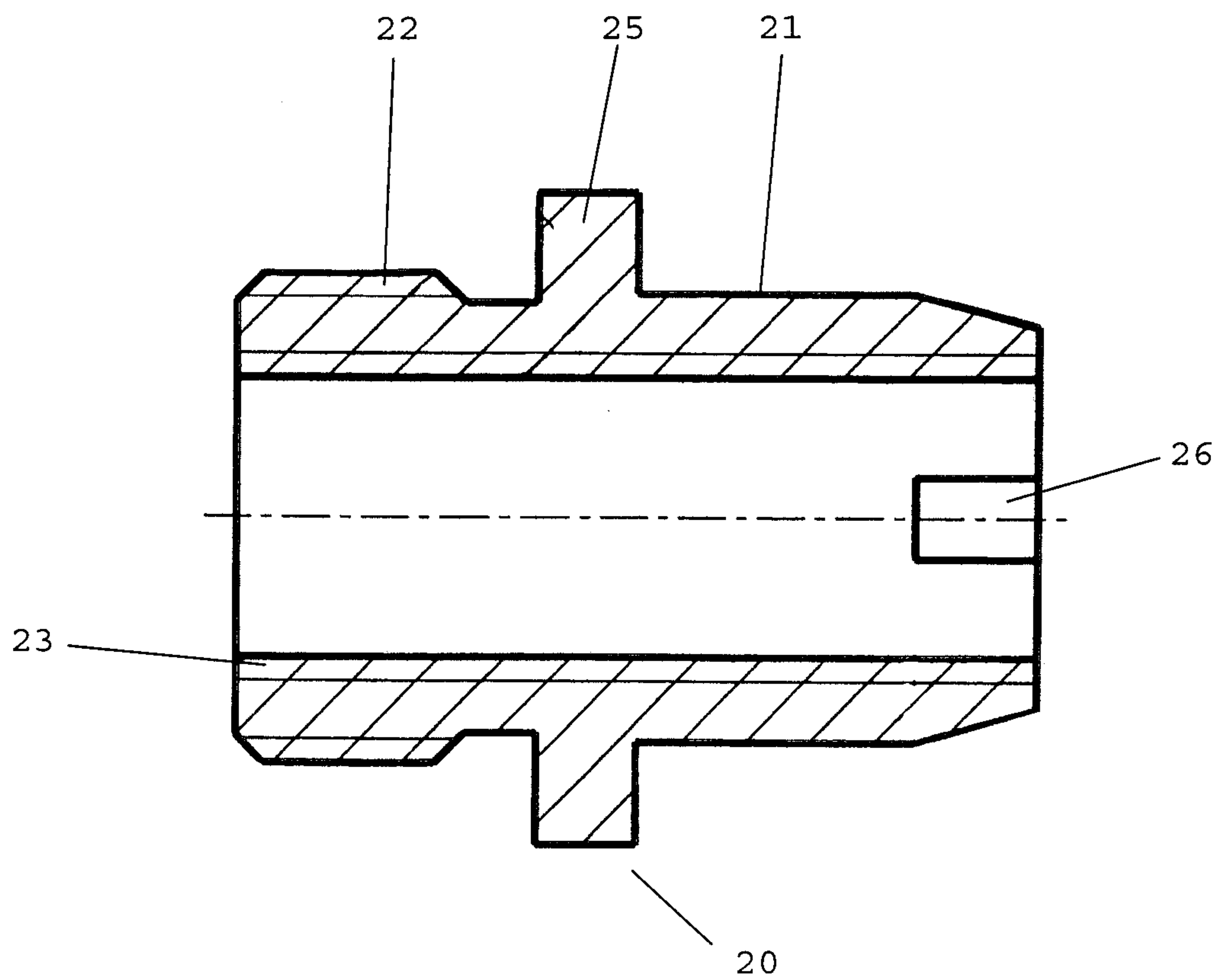


Fig. 5

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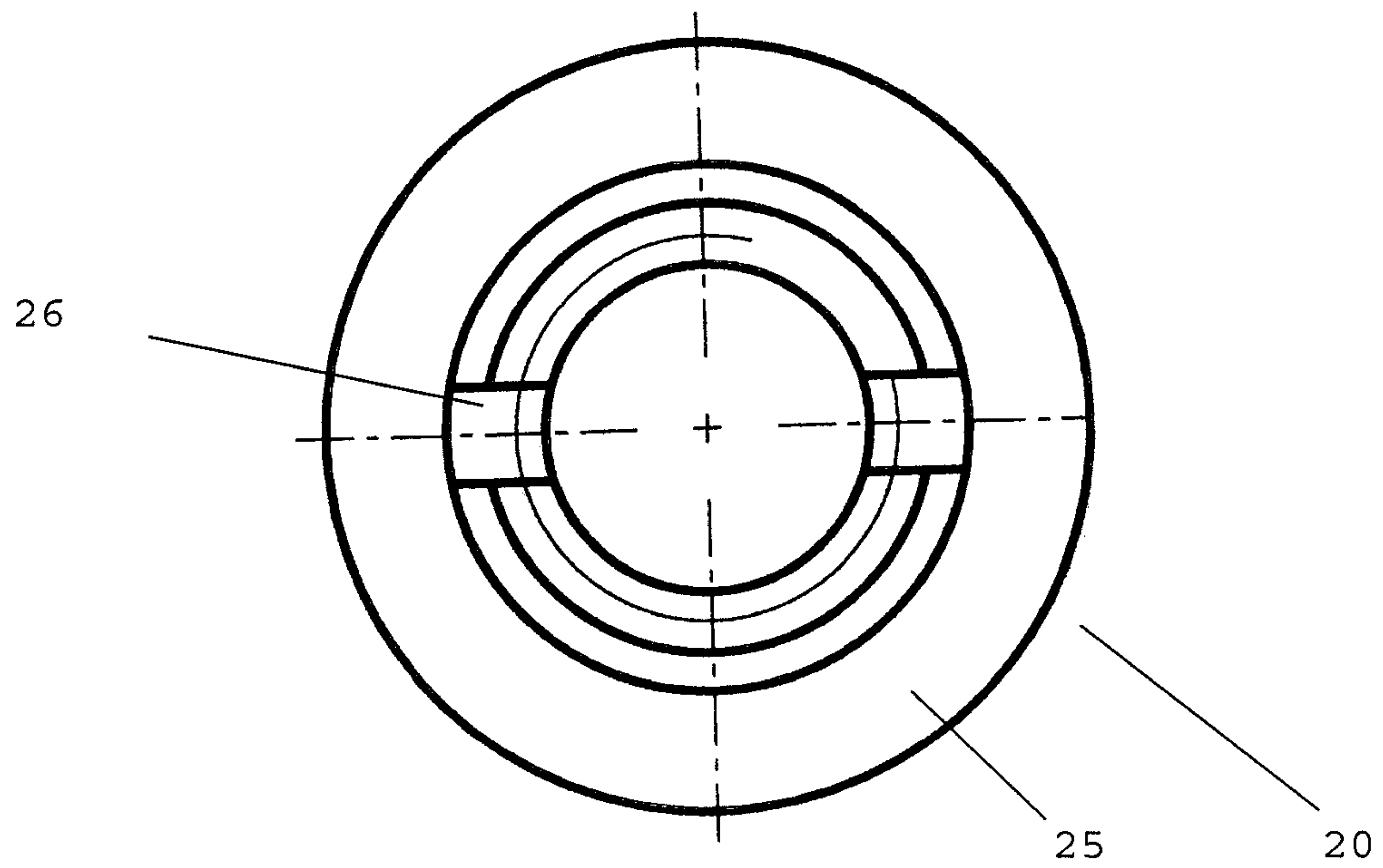
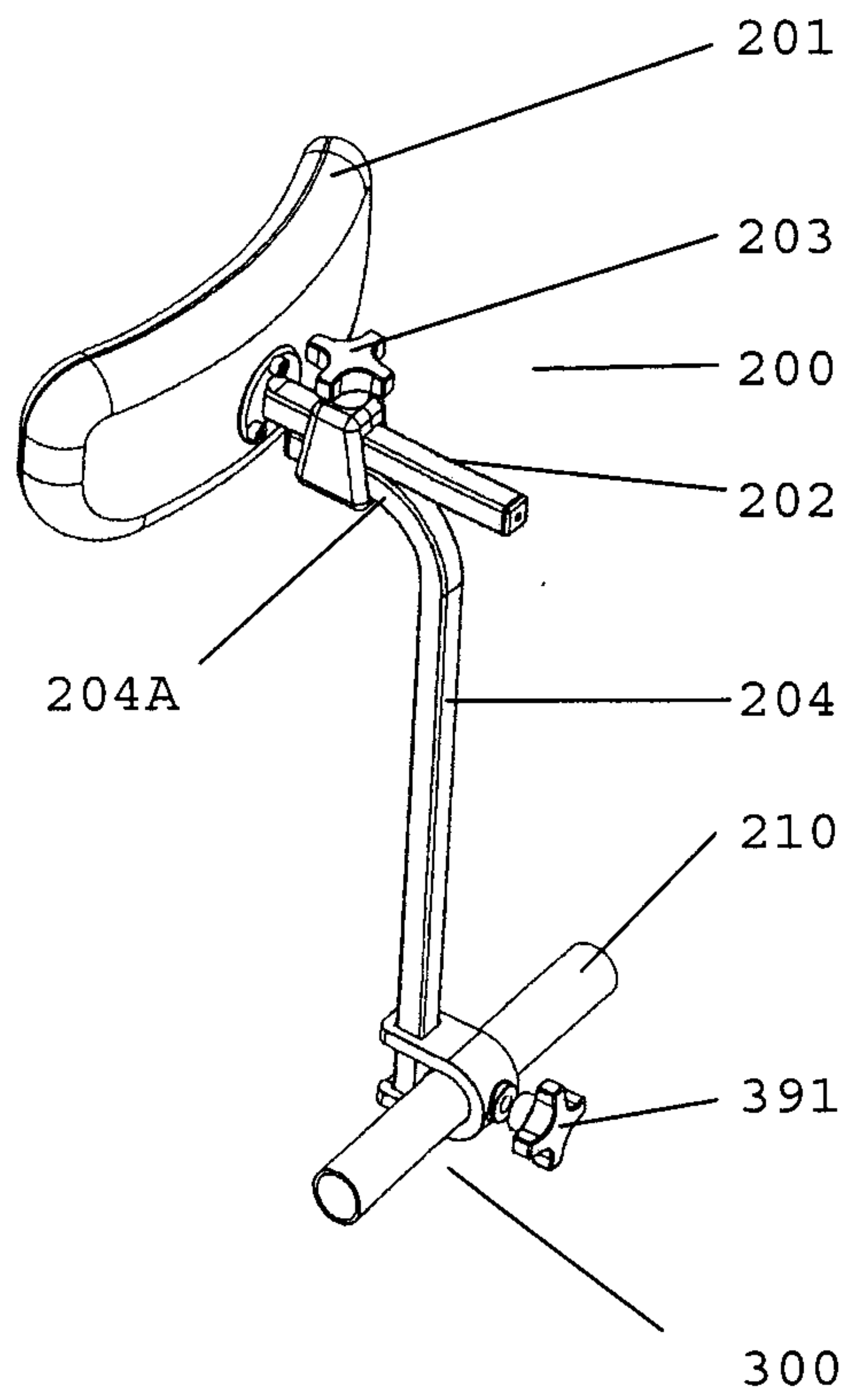


Fig. 6

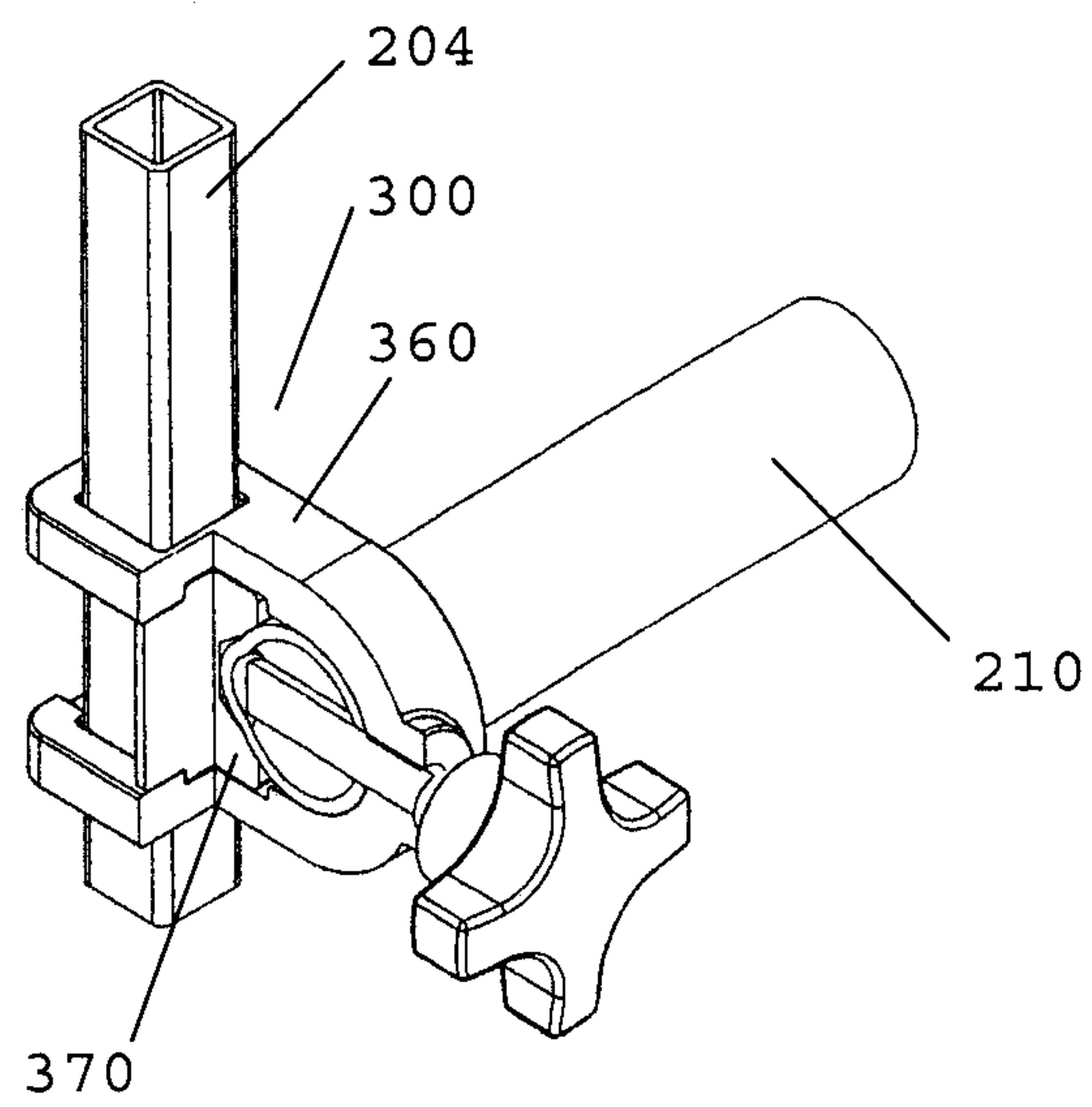
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PRIOR ART

Fig. 7

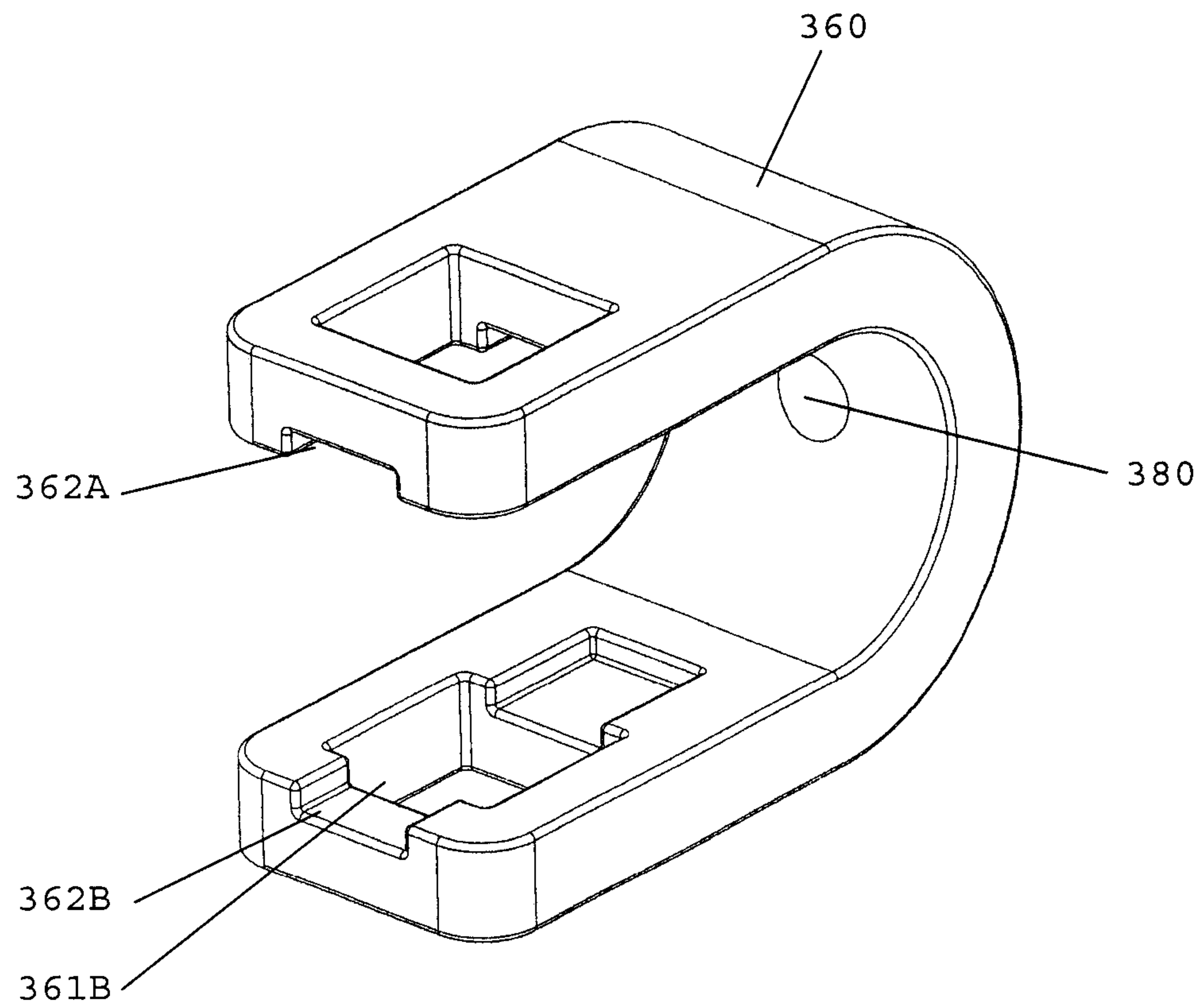
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PRIOR ART

Fig. 8

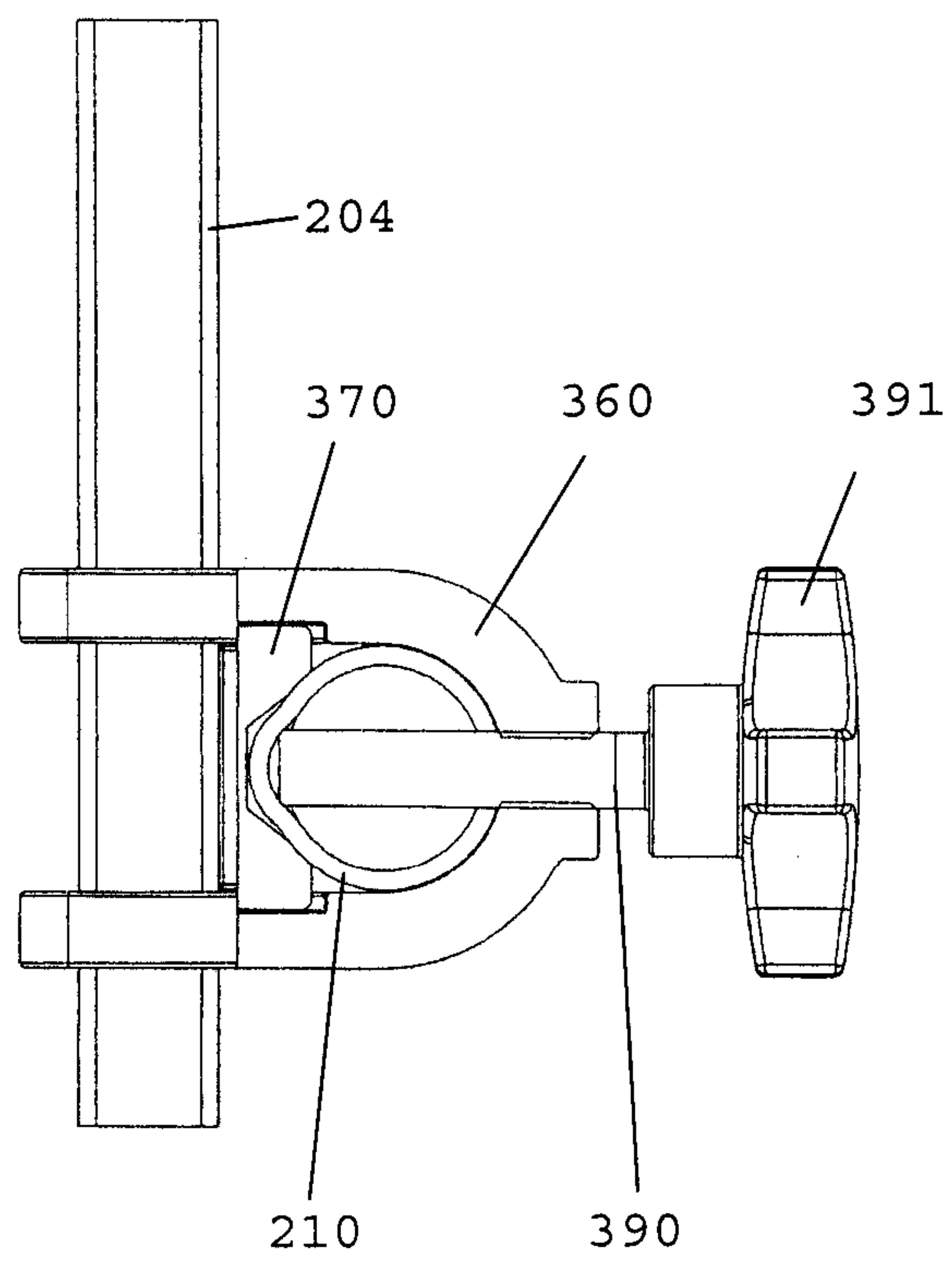
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PRIOR ART

Fig. 9

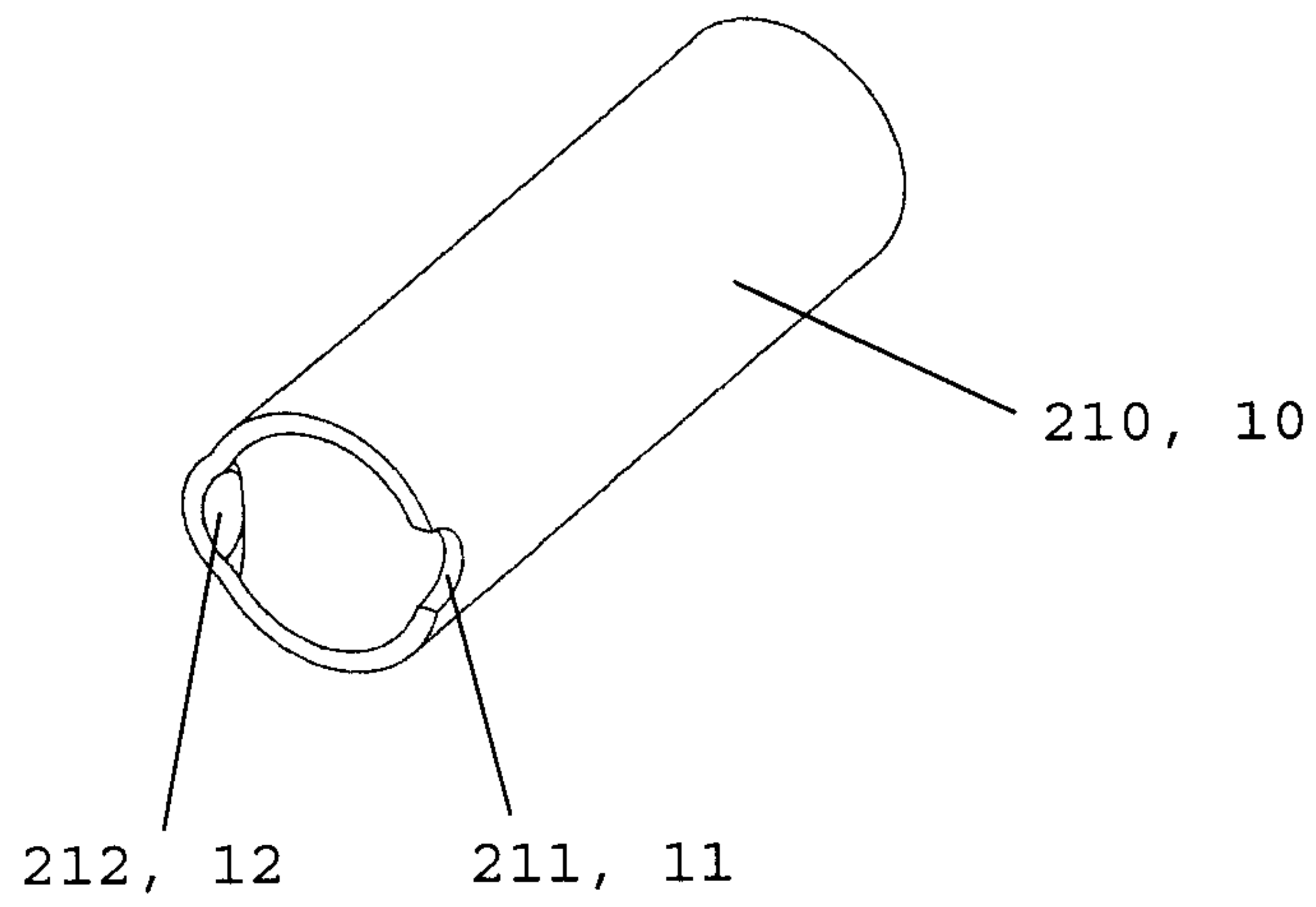
10/11



PRIOR ART

Fig. 10

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PRIOR ART

Fig. 11

