Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2960452 A1 2016/03/17

(21) 2 960 452

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) **Date de dépôt PCT/PCT Filing Date:** 2015/09/08
(87) **Date publication PCT/PCT Publication Date:** 2016/03/17
(85) **Entrée phase nationale/National Entry:** 2017/03/07
(86) **N° demande PCT/PCT Application No.:** IL 2015/050909
(87) **N° publication PCT/PCT Publication No.:** 2016/038605
(30) **Priorités/Priorities:** 2014/09/09 (US62/047,739); 2014/10/28 (US62/069,466)

(51) **Cl.Int./Int.Cl.** ***A47C 7/38*** (2006.01), ***A47C 7/36*** (2006.01), ***A47D 15/00*** (2006.01), ***B60N 2/26*** (2006.01)

(71) **Demandeur/Applicant:**
ALLDEAL LTD., IL

(72) **Inventeur/Inventor:**
COHEN GAZIT, BEN, IL

(74) **Agent:** RIDOUT & MAYBEE LLP

(54) **Titre : ELEMENT DE RETENUE DE TETE**
(54) **Title: A HEAD RESTRAINT**

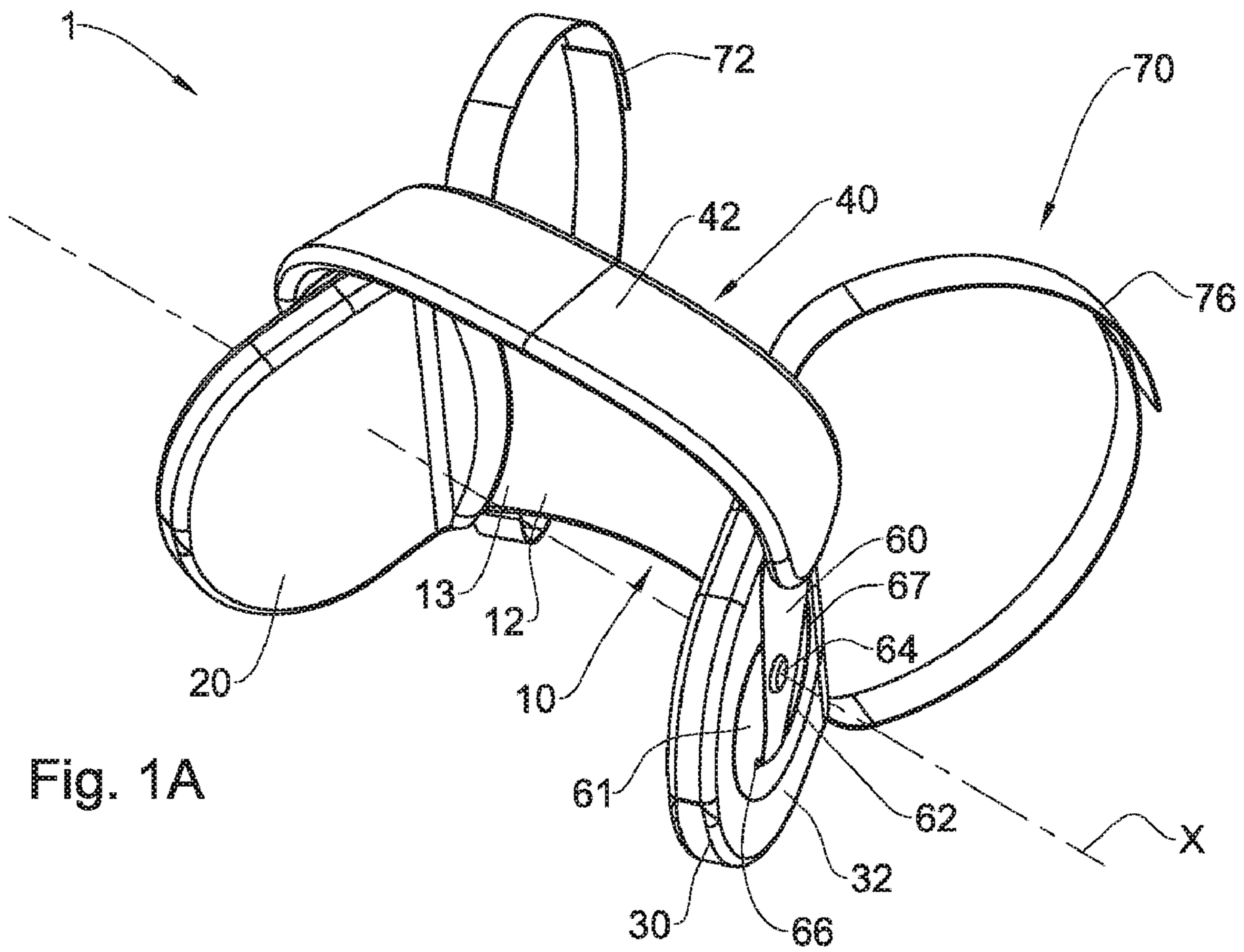


Fig. 1A

(57) **Abrégé/Abstract:**
A head restraint comprising: a headrest member configured with a back portion and two side portions extending therefrom; a mounting arrangement articulated to the headrest member for mounting the head restraint to a seat; and a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 March 2016 (17.03.2016)

WIPO | PCT

(10) International Publication Number
WO 2016/038605 A1

(51) International Patent Classification:
A47C 7/38 (2006.01) *A47C 7/36* (2006.01)
A47D 15/00 (2006.01) *B60N 2/26* (2006.01)

(21) International Application Number:
PCT/IL2015/050909

(22) International Filing Date:
8 September 2015 (08.09.2015)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/047,739 9 September 2014 (09.09.2014) US
62/069,466 28 October 2014 (28.10.2014) US

(72) Inventor; and
(71) Applicant : **COHEN GAZIT, Ben** [IL/IL]; 3 Adirim, App. 44, 6918404 Tel Aviv (IL).

(74) Agent: **LITVAK, Dima**; Reinhold Cohn & Partners, 26A Habarzel Street, 6971037 Tel-Aviv (IL).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

(54) Title: A HEAD RESTRAINT

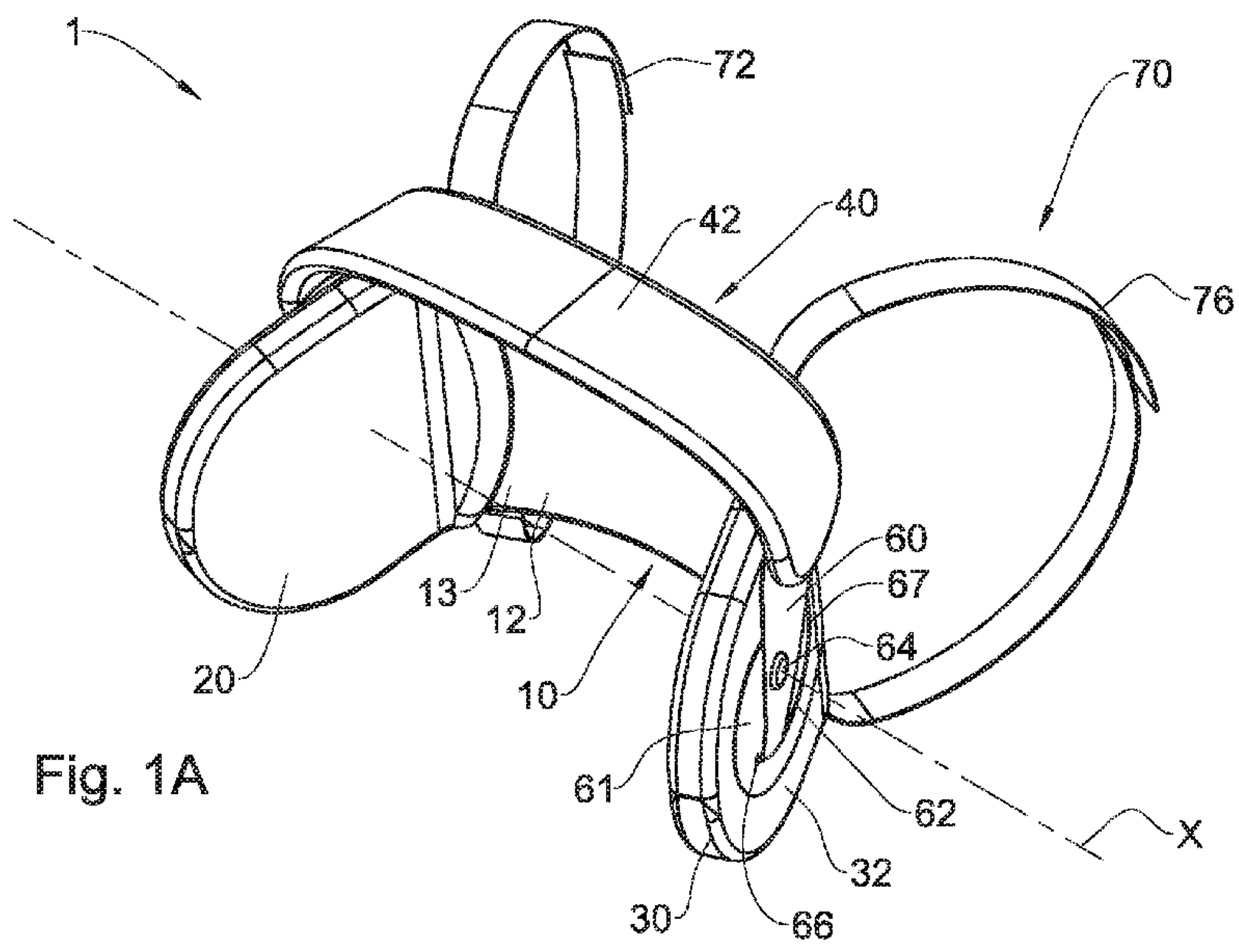


Fig. 1A

(57) Abstract: A head restraint comprising: a headrest member configured with a back portion and two side portions extending therefrom; a mounting arrangement articulated to the headrest member for mounting the head restraint to a seat; and a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position.

WO 2016/038605 A1

A HEAD RESTRAINT

TECHNICAL FIELD

This presently disclosed subject matter relates to head restraints, and more particularly to head restraints for use in conjunction with a seat.

BACKGROUND

Head restraints are used in order to provide improved head and neck support to a user while seated in a seat, e.g., in case the user falls asleep or in case of an individual with physical disorders. A head restraint can be used for preventing the user's head from falling forward or tilting to the left or the right side. This provides comfortable and stable support of the user's head while sitting on the seat.

For example, during sleep, the muscles in the neck and back of the human body that normally support the head are relaxed. The result in that when human beings (such as, babies) are asleep in a car seat, their head will fall forward or "roll" to the left or right, placing strain on the user's neck and spine and causing discomfort that diminishes the quality of sleep that the child enjoys. While driving in and around city streets, the forces associated with vehicle acceleration, braking, and sharp turns, respectively, further magnify the harmful effects on the neck and spine caused by the child's head not being supported.

There are many head restraints for adults and children are known in the art. One example is disclosed in US 7,740,318 that discloses a padded strap that is attached to both sides of a child car seat using two sets of hook and loop type fasteners, and alternatively, through use of two rotating discs. Additional example is disclosed in US 2013/0300176 that discloses a head restraint system including a support arm formed of a flexible material which is displaceable between a first position extending horizontally across a portion of a child's forehead and a second position disposed away from the child's forehead.

SUMMARY OF THE PRESENTLY DISCLOSED SUBJECT MATTER

According to a first aspect of the presently disclosed subject matter, there is provided a head restraint comprising:

a headrest member configured with a back portion and two side portions extending therefrom;

a mounting arrangement articulated to the headrest member for mounting the head restraint to a seat; and

a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position.

The head restraint is configured for providing improved head and neck support to a user while seated in a seat, e.g., in case the user falls asleep or in case of an individual with physical disorders. More particularly, the restraining member is configured for preventing the user's head from falling forward, and the headrest member is configured for preventing the user's head from tilting to the left or the right side. This provides comfortable and stable support of the user's head while sitting on the seat. The head restraint can be mounted on any seat such as a seat of a vehicle, so as to provide increased head and neck stability to a user upon turning, braking or collision of the vehicle.

In use, when the user's head is positioned at the head restraint, the restraining member in its upward position can be located substantially above the use's head, and in its downward position the restraining member can be located substantially in front of the user's forehead.

The term 'user' as used herein in the specification and claims, denotes an individual, an infant, a child or an adult.

The term 'vehicle' as used herein in the specification and claims, denotes a wheel chair, an automobile, a bus, a train, a ship, an airplane, and the like.

The term 'seat' as used herein in the specification and claims refers to a booster seat, a highback booster, a safety seat, a stroller, a vehicle seat, a seat of a wheel chair, a chair, a bench, etc. The term 'seat' also refers to a portion of a seat, such as a seat headrest, or any other portion of any conventional seat.

The head restraint can be an add-on, i.e., it can be installed on various types of seats.

Any one or more of the following features, designs and configurations can be incorporated in the presently disclosed subject matter according to the first aspect, independently or in combination thereof:

The side portions of the headrest member can be foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

At the second state, the side portions can be disposed in proximity to the user's ears. This can be useful in reducing noise and thus improving the quality of the user's sleep.

Each of the side portions can be configured with an earphone, so that in the second state the earphones are disposed in proximity to the user's ears for providing sound thereto. The sound can be, for example, a relaxing music, a story, or parent's voice.

Displacement of the restraining member between its upward position and its downward position can be configured to cause the headrest member to assume its first and second states, respectively.

The back portion and the side portions can be integral and continuous or attachable to one another.

The back portion and the side portions can be formed as support cushions.

The back portion is configured to provide support to the back portion of the user's head, and the side portions are configured to provide support to the side portions of the user's head. The side portions can constitute a side impact protector for the user's head.

Rotation of the restraining member between the upward and downward positions can be performed by the user himself by one of his hands.

In the downward position, the restraining member can be spaced from the forehead of the user so that a gap extends between the forehead and the restraining

member. This gap can provide an extra measure of comfort to the user, as there is no contact between the forehead and the restraining member. However, the gap should not be too great in order to allow the restraining member to effectively operate for delimiting forward movement of the head.

The restraining member can be configured with two side members and a central member disposed therebetween. One of the side members can be pivotally articulated to an exterior face of one side portion of the headrest member, and another one of the side members can be pivotally articulated to an exterior face of another one of the side portions of the headrest member. The pivotal connection can be provided by snap fasteners.

The central member of the restraining member can be formed as a strap.

Each of the side portions can be configured with a delimiting channel formed at its exterior face.

Each of the side members can be configured with a projecting portion configured to be received within its respective delimiting channel and displaced between two extreme ends thereof upon displacement of the restraining member between the upward and downward positions.

The side members and the delimiting channels can be made of a flexible, though hard plastic material. For example, the side members and the delimiting channels can be made of a polymer such as polypropylene.

The delimiting channels can have a shape of an arc, the length of which corresponds to the angle between the headrest member and the restraining member in its upward and downward positions.

The head restraint can be modular and can have the following two configurations:

- a frontal configuration in which the restraining member is pivotally mounted to the headrest member to be displaced between its upward and downward positions; and
- a rear configuration in which the restraining member is disposed at the rear side of the headrest member and connected thereto; at the rear configuration, the restraining member substantially entirely engages an exterior face of the

headrest member; at the rear configuration, the head restraint can be compactly packed by being rolled or folded.

The restraining member can have a varying length so as to: adjust the distance between the user's forehead and the restraining member, adjust the distance between the upper portion of the user's head and the restraining member, and adjust the head restraint to different sized heads.

The side members can be articulated to the central member by hoop and loop fasteners (e.g., Velcro® fasteners).

The hoop and loop fasteners can allow regulating the length of the restraining member. Moreover, the hoop and loop fasteners can allow regulating the vertical location of the central member with respect to the side members. This vertical regulation allows positioning the central member exactly in front of the user's (e.g., a child's) forehead. However, when an adult uses the headrest member, the central member can be located in front of his eyes so as to be used as a sleep mask.

The central member can be flexible and can be formed of a soft, rigid though pliable material.

The headrest member can also be flexible and can be formed of a soft, rigid though pliable material.

The mounting arrangement can comprise two pairs of strips. Each pair of strips is articulated to each other by connecting means such as buckles, length regulating elements, or hoop and loop fasteners.

The mounting arrangement can be configured for attaching the head restraint to a seat headrest of the seat.

The mounting arrangement can be used for regulating the height of the head restraint with respect to the seat and to height of the user's head.

The head restraint can further include a sensing unit mounted thereto for detecting situations in which a child or an infant is left alone in the vehicle. Such a sensing unit can be configured with an alert system for alerting such situations.

The head restraint can further include a microphone mounted thereto for amplifying the voice of the user (e.g., a child's voice).

According to a second aspect of the presently disclosed subject matter, there is provided a head restraint comprising:

a headrest member configured with a back portion and two side portions extending therefrom; and

a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position;

wherein the side portions of the headrest member are foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

According to a third aspect of the presently disclosed subject matter, there is provided a seat comprising:

(a) a seating portion;

(b) a seat headrest; and

(c) a head restraint comprising a headrest member configured with a back portion attached to the seat headrest and two side portions extending therefrom; and a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position;

wherein the side portions of the headrest member are foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

Any one or more of the following features, designs and configurations can be incorporated in the presently disclosed subject matter according to the second or the third aspects, independently or in combination thereof:

Displacement of the restraining member between its upward position and its downward position can be configured to cause the headrest member to assume its first and second states, respectively.

The back portion can be attached to the seat headrest by various fastening means such as: sewing, clips, a zipper, hoop and loop fasteners, etc.

The head restraint can be attached to various types of seats, such as a booster seat, a safety seat, a stroller, a vehicle seat, a seat of a wheel chair, a chair, a bench, etc.

At the second state, the side portions can be disposed in proximity to the user's ears. This can be useful in reducing noise and thus improving the quality of the user's sleep.

Each of the side portions can be configured with an earphone, so that in the second state the earphones are disposed in proximity to the user's ears for providing sound thereto. The sound can be, for example, a relaxing music, a story, or parent's voice.

The back portion and the side portions can be integral and continuous or attachable to one another.

The back portion and the side portions can be formed as support cushions.

The back portion is configured to provide support to the back portion of the user's head, and the side portions are configured to provide support to the side portions of the user's head. The side portions can constitute a side impact protector for the user's head.

Rotation of the restraining member between the upward and downward positions can be performed by the user himself by one of his hands.

In the downward position, the restraining member can be spaced from the forehead of the user so that a gap extends between the forehead and the restraining member. This gap can provide an extra measure of comfort to the user, as there is no contact between the forehead and the restraining member. However, the gap should not be too great in order to allow the restraining member to effectively operate for delimiting forward movement of the head.

The restraining member can be configured with two side members and a central member disposed therebetween. One of the side members can be pivotally articulated to an exterior face of one side portion of the headrest member, and another one of the side members can be pivotally articulated to an exterior face of another one of the side

portions of the headrest member. The pivotal connection can be provided by snap fasteners.

The central member of the restraining member can be formed as a strap.

Each of the side portions can be configured with a delimiting channel formed at its exterior face.

Each of the side members can be configured with a projecting portion configured to be received within its respective delimiting channel and displaced between two extreme ends thereof upon displacement of the restraining member between the upward and downward positions.

The side members and the delimiting channels can be made of a flexible, though hard plastic material. For example, the side members and the delimiting channels can be made of a polymer such as polypropylene.

The delimiting channels can have a shape of an arc, the length of which corresponds to the angle between the headrest member and the restraining member in its upward and downward positions.

The head restraint can be disconnected from the seat headrest.

The head restraint can be modular and can have the following two configurations:

- a frontal configuration in which the restraining member is pivotally mounted to the headrest member to be displaced between its upward and downward positions; and
- a rear configuration in which the restraining member is disposed at the rear side of the headrest member and connected thereto; at the rear configuration, the restraining member substantially entirely engages an exterior face of the headrest member; at the rear configuration, the head restraint can be compactly packed by being rolled or folded.

The restraining member can have a varying length so as to: adjust the distance between the user's forehead and the restraining member, adjust the distance between the upper portion of the user's head and the restraining member, and adjust the head restraint to different sized heads.

The side members can be articulated to the central member by hoop and loop fasteners (e.g., Velcro® fasteners).

The hoop and loop fasteners can allow regulating the length of the restraining member. Moreover, the hoop and loop fasteners can allow regulating the vertical location of the central member with respect to the side members. This vertical regulation allows positioning the central member exactly in front of the user's (e.g., a child's) forehead. However, when an adult uses the headrest member, the central member can be located in front of his eyes so as to be used as a sleep mask.

The central member can be flexible and can be formed of a soft, rigid though pliable material.

The headrest member can also be flexible and can be formed of a soft, rigid though pliable material.

The head restraint can further include a sensing unit mounted thereto for detecting situations in which a child or an infant is left alone in the vehicle. Such a sensing unit can be configured with an alert system for alerting such situations.

The head restraint can further include a microphone mounted thereto for amplifying the voice of the user (e.g., a child's voice).

BRIEF DESCRIPTION OF THE DRAWINGS

In order to better understand the subject matter that is disclosed herein and to exemplify how it may be carried out in practice, embodiments will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Fig. 1A is a front perspective view of a head restraint with a restraining member in its upward position, in accordance with one example of the presently disclosed subject matter;

Fig. 1B is a top view of the head restraint of **Fig. 1A**, with an individual's head superimposed;

Fig. 1C is a side view of the head restraint of **Fig. 1A**;

Fig. 1D is a front view of the head restraint of **Fig. 1A**;

Fig. 1E is the head restraint of **Fig. 1D** being installed on a safety seat within a vehicle;

Fig. 1F is the head restraint of **Fig. 1E** with a child seated on the safety seat and her head positioned at the head restraint;

Fig. 2A is a front perspective view of the head restraint of **Fig. 1A** with the restraining member in its downward position;

Fig. 2B is an upper view of the head restraint of **Fig. 2A**;

Fig. 2C is a side view of the head restraint of **Fig. 2A**;

Fig. 2D is a front view of the head restraint of **Fig. 2A**;

Fig. 2E is the head restraint of **Fig. 2D** installed on a safety seat within a vehicle;

Fig. 2F is the head restraint of **Fig. 2E** with the child seated on the safety seat and her head is positioned at the head restraint;

Fig. 3 is the head restraint of **Fig. 1A** in a disassembled configuration in which the restraining member and the headrest member of the head restraint are disassembled from each other;

Fig. 4A is the head restraint of **Fig. 1A** in a rear configuration in which the restraining member is located at the rear side of the headrest member and connected thereto;

Fig. 4B is the head restraint of **Fig. 4A** in its packed form;

Fig. 5 is a front view of a head restraint integrated with a safety seat, in accordance with another example of the presently disclosed subject matter;

Fig. 6A is a front perspective view of the head restraint in accordance with the example of **Fig. 5**, with a restraining member in its upward position,;

Fig. 6B is a top view of the head restraint of **Fig. 6A**, with an individual's head superimposed;

Fig. 6C is a side view of the head restraint of **Fig. 6A**;

Fig. 6D is a front view of the head restraint of **Fig. 6A**;

Fig. 6E is the head restraint of **Fig. 6D** being installed on a safety seat within a vehicle;

Fig. 6F is the head restraint of **Fig. 6E** with a child seated on the safety seat and her head positioned at the head restraint;

Fig. 7A is a front perspective view of the head restraint of **Fig. 6A** with the restraining member in its downward position;

Fig. 7B is an upper view of the head restraint of **Fig. 7A**;

Fig. 7C is a side view of the head restraint of **Fig. 7A**;

Fig. 7D is a front view of the head restraint of **Fig. 7A**;

Fig. 7E is the head restraint of **Fig. 7D** integrated with a safety seat within a vehicle;

Fig. 7F is the head restraint of **Fig. 7E** with the child seated on the safety seat and her head is positioned at the head restraint; and

Fig. 8 is the head restraint of **Fig. 6A** in a disassembled configuration in which the restraining member and the headrest member of the head restraint are disassembled from each other.

DETAILED DESCRIPTION OF EMBODIMENTS

Attention is first directed to Figs. 1A to 1F of the drawings illustrating a head restraint in accordance with one example of the presently disclosed subject matter, generally designated **1**.

The head restraint **1** comprises a headrest member **10**, a restraining member **40** pivotally articulated thereto, and a mounting arrangement **70** extending from the headrest member **10** for mounting the head restraint **1** as an add-on to a safety seat **3** in which a child can be seated (shown in Figs. 1E, 1F, 2E and 2F), or to any other seat.

The restraining member **40** is configured to be rotated with respect to the headrest member **10** about an **X** axis (shown in Figs. 1B and 2B) between an upward position (shown in Figs. 1A to 1F) and a downward position (shown in Figs. 2A to 2F). This rotation can be performed by the user himself, by one of his hands.

Reference is now made to Figs. 1F and 2F, in order to explain the general manner of operation of the head restraint **1** which is attached to a seat headrest **4** of a safety seat **3.**

As shown in Fig. 1F, in the upward position of the restraining member **40**, a child **5** is seated on the safety seat **3**, her head **6** rests on the headrest member **10**, and the restraining member **40** is disposed above the head **6** in a bow-like fashion, however with a sufficient gap over the child's head. In addition, the headrest member **10** is in its first state, in which its first and second side portions **20** and **30** are spaced from each other at a first extent. In this position, the child **5** is awake and her head **6** is free to move in the forward direction and to each side, however limited to a certain extent by the seat headrest's side portions **4a** and **4b**.

As shown in Fig. 2F, the child **5** has fallen asleep and thus the head restraint **1** is in the downward position. In this position, the restraining member **40** is disposed in front of a forehead **7** of the child **5** in order restrain the movement of the head **6** in the forward direction. In addition, the headrest member **10** is in its second state in which its side portions are spaced from each other to a second extent which is smaller than the first extent, thereby restraining movement of the head **6** to the sides. This restraint by the restraining member **40** and the side portions of the headrest member **10** provide increased stability and comfortable support of the head **6** while the child **5** sleeps. In particular, the restraining member **40** prevents the user's head **6** from falling forward, and the first and the second side portions **20** and **30** prevent the user's head **6** from tilting to the left or the right side. Moreover, the above restraint can provide increased head and neck stability to a user upon turning, braking or collision of the vehicle.

Reference is now made to Figs. 1A to 1F, in order to explain in a detailed manner the structure and manner of operation of the head restraint **1** with the restraining member **40** in its upward position and the headrest member **10** in its first state.

The headrest member **10** has a back portion **12**, a first side portion **20** and a second side portion **30**. The back portion **12** and the first and second side portions **20** and **30** are formed as support cushions for the child's head **6**. As shown in Fig. 1B, the back portion **12** provides support to a back portion **9** of the head **6**.

The first side portion **20** and the second side portion **30** extend from two opposite ends of the back portion **12**, i.e., a first end **13** and a second end **14**, respectively. Moreover, the first side portion **20** and the second side portion **30** are

foldable with respect to the central portion **12** between the first state (Figs. 1A to 1F) and the second state of the headrest member **10** (Figs. 2A to 2F).

The restraining member **40** is configured with a first side member **50**, a second side member **60** and a central member **42** disposed therebetween. The central member **42** is formed as a strap and as shown in Fig. 1F, is disposed above the child's head **6**.

The first side member **50** and the second side member **60** are attached to the central member **42** by hoop and loop fasteners. The hoop and loop fasteners allow regulating the length of the restraining member **40** so as to adjust the distance between the child's forehead and the restraining member **40** (in the downward position of the restraining member), the distance between the child's upper portion of the head and the restraining member **40** (in the upward position of the restraining member) and to adjust the head restraint **1** to different sized heads.

Moreover, the hoop and loop fasteners allow regulating the vertical location of the central member **42** with respect to the first and the second side members **50** and **60**. For example, if the user of the head restraint **1** wants to use the central member **42** as a sleep mask, he can position the central member **42** with respect to the first and the second side members **50** and **60** so that the central member **42** is located in front of his eyes, instead of his forehead.

Pivotal articulation of the restraining member **40** to the headrest member **10** is provided by articulation of the first side member **50** to an exterior face **22** (shown in Fig. 3) of the first side portion **20** by means of a first snap fastener **54** (shown in Fig. 3), and by articulation of the second side member **60** to an exterior face **32** of the second side portion **30**, by means of a second snap fastener **64**.

The first side portion **20** is configured with a first delimiting channel **52** (shown in Fig. 3) formed at the exterior face **22**, and the second side portion **30** is configured with a second delimiting channel **62** formed at the exterior face **32**. The first delimiting channel **52** is formed within a channel element **51** which is mounted to the exterior face **22**. The second delimiting channel **62** is formed within a channel element **61** which is mounted to the exterior face **32**. According to the particular example, the channel elements **51** and **61** of the exterior faces **22** and **32** are related to a single element by being connected by a connecting strip (seen in Fig. 3).

The first delimiting channel **52** and the second delimiting channel **62** are arced shaped, the length of which corresponds to the angle between the headrest member **10** and the restraining member **40** between its upward and downward positions. According to the present example, this angle is about 120º.

As can be seen in Fig. 3, the first side member **50** is configured with a first projecting portion **55** which is received and slidingly displaceable within the first delimiting channel **52** between two extreme ends thereof upon displacement of the restraining member **40** between its upward and downward positions.

As shown in Figs. 1A and 1C, the second side member **60** is configured with a second projecting portion **65** (not shown in Fig. 1A) which is received and slidingly displaceable within the second delimiting channel **62** between a lower end **66** and an upper end **67** upon displacement of the restraining member **40** between the upward and downward positions, respectively. The lower end **66** restricts further upward pivoting of the restraining member **40** beyond its upward position, and the upper end **66** restricts further downward pivoting of the straining member **40** beyond its downward position, thereby, for example, preventing the central member **42** to be located lower than a predetermined level, e.g., in front of the child's eyes.

The central member **42** is formed of a flexible and soft material. This material is rigid though pliable. The headrest member **10** is formed of flexible and soft cushioning material. The first side member **50**, the second side member **60**, the two channel elements **51** and **61**, are all made of a hard and a rigid though pliable plastic material. According to the present example, this material is polymer, and in particular, polypropylene.

It should be indicated that according to other examples, the headrest member **10** is not necessarily flexible, but in any case should allow pivoting of its side portions.

The mounting arrangement **70** comprises a first pair of strips **72** and a second pair of strips **76**. Each pair of strips is articulated to each of the other hoop and loop fasteners. According to other examples, the strips are articulated to each other known mechanical means.

As indicated above, the headrest member **10** is shown in Figs. 1A to 1F in its first state. At this state, the first side portion **20** and the second side portion **30** are

spaced from each other at a first extent represented by a distance **D1** (Figs. 1B and 1D). The distance **D1** is taken along an axis that is parallel to the axis of rotation **X** and passes through a central point **6'** of the head **6**. The first state of the headrest member **10** is in its normal state to which the side portions of the headrest member **10** tend to revert. The normal state is provided due to the geometry and the structure of the headrest member **10**.

The restraining member **40** is structured so that the distance between the first and the second side members **50** and **60** is substantially constant during the pivoting of the restraining member **40** between its upward and downward positions. In light of this characteristic of the restraining member **40**, and the fact that the distance between the first and the second side members **50** and **60** is smaller than the distance between the external faces **22** and **32** at the upward configuration of the restraining member **40**, displacement of the restraining member **40** from its upward position to its downward position causes the headrest member **10** to assume its second state. This result is provided by the first and the second side members **50** and **60**, which bend the first and the second side portions **20** and **30** with respect to the back portion **12**, respectively, causing them to approach each other. Likewise, displacement of the restraining member **40** from its downward position to its upward position causes the headrest member **10** to assume its normal first state.

Reference is now made to Figs. 2A to 2F, in order to explain in a detailed manner the structure and manner of operation of the head restraint **1** with the restraining member **40** in its downward position and the headrest member **10** in its second state.

As shown in Fig. 2B, in the downward position of restraint member **40**, its central member **42** is located in front of the forehead **7** of the child's head **6**, and spaced therefrom so that a gap **m** extends between the central member **42** and the forehead **7**. The gap **m** provides an extra measure of comfort to the child **5**, since when the child **5** is awake, there is no contact between the forehead **7** and the restraining member **40**. However, the gap should not be too great in order to allow the restraining member **40** to effectively operate when the contact between the forehead **7** and the central member **42** is established. This contact may be established if the child's head **6** will fall in the forward direction when she falls asleep.

In addition, as shown in Figs. 2B, the first and the second side portions **20** and **30** provide support to the sides **8** and **8'** of the child's head (in Fig. 2B). The first and the second side portions **20** and **30** further constitute a side impact protector for the user's head **6**.

As indicated above, the headrest member **10** is shown in Figs. 2A to 2F in its second state. At this state, the first side portion **20** and the second side portion **30** are spaced from each other at a second extent represented by a distance **D2** (shown in Figs. 2B and 2D), which is smaller than the distance **D1**. The distance **D2** is taken along an axis that is parallel to the axis of rotation **X** and passes through the central point **6'** of the head **6**. As shown in Fig. 2B, the first and the second side portions **20** and **30** are disposed in proximity to the user's temples, thereby reducing noise that approaches the child's ears and improving the quality of her sleep.

The distance **D2** can be regulated by changing the length of the restraining member **40**. For example, if the child feels discomfort with the first and the second side portions touching his ears, the length of the restraining member **40** can be increased, thereby increasing the distance **D2**.

The head restraint of the presently disclosed subject matter is modular, and has two configurations: a frontal configuration (shown in Figs. 1A to 1F and 2A to 2F) and a rear configuration (shown in Fig. 4A).

As opposed to the frontal configuration in which the restraining member **40** is pivotable between its upward and downward positions, in the rear configuration, the restraining member **40** is not displaceable between these positions.

Reference is now made to Fig. 3 in which the head restraint **1** is shown in its disassembled configuration. At this configuration, the headrest member **10** is disengaged from the restraining member **40**. Moreover, the restraining member **40** itself is disassembled so that the central member **42** is disconnected from the first side member **50** and the second side member **60**.

Reference is now made to Fig. 4A, in order to describe the rear configuration of the head restraint **1** in a detailed manner. At the rear configuration, the first and the second side members **50** and **60** are articulated to a rear side of the headrest member **10** and connected thereto. In particular, the restraining member **40** entirely engages an

exterior face **18** of the headrest member **10**, the first side member **50** is articulated to the exterior face **22** by means of a first snap fastener **54** (not seen in Fig. 4A), and the second side member **60** is articulated to the exterior face **32** by means of the second snap fastener **64**. The first and the second projecting portions are extracted from their respective first and second delimiting channels. As shown in Fig. 4A, in order to obtain full engagement of the restraining member **40** with the exterior face **18** of the headrest member **10**, the length of the restraining member **40** is decreased respectively.

At the rear configuration, the head restraint **1** is inoperative, and can be transported from place to place to be mounted on different seats, when needed. Moreover, at the rear configuration, the head restraint **1** can be compactly packed by being rolled or folded in the direction of arrow **90**.

Reference is now made to Fig. 4B, in which the head restraint **1** is shown in its packed form. This form is obtained by rolling the head restraint **1** of Fig. 4A in the direction of arrow **90**. As seen in Fig. 4B, in the packed form, the head restraint **1** is very compact and can be grasped by one hand of an adult.

Attention is now directed to Figs. 5 and 6A to 6F of the drawings illustrating a safety seat **103** with a head restraint **100** in accordance with another example of the presently disclosed subject matter.

The safety seat **103** is configured with a seating portion **101** configured for supporting a body of a child and a seat headrest **104** configured for supporting a head of a child. The head restraint **100** is attached to and integrated with the seat headrest **104** of by sewing, and eventually constitutes a part of the safety seat **103**.

With reference to Figs. 6A to 6F, the head restraint **100** comprises a headrest member **110** and a restraining member **140** pivotally articulated thereto. The restraining member **140** is configured to be rotated with respect to the headrest member **110** about an **X** axis (shown in Figs. 6B and 7B) between an upward position (shown in Figs. 6A to 6F) and a downward position (shown in Figs. 7A to 7F). This rotation can be performed by the user himself, by one of his hands.

Reference is now made to Figs. 6F and 7F, in order to explain the general manner of operation of the head restraint **100**.

As shown in Fig. 6F, in the upward position of the restraining member **140**, a child **105** is seated on the safety seat **103**, her head **106** rests on the headrest member **110**, and the restraining member **140** is disposed above the head **106** in a bow-like fashion, however with a sufficient gap over the child's head. In addition, the headrest member **110** is in its first state, in which its first and second side portions **120** and **130** are spaced from each other at a first extent. In this position, the child **105** is awake and her head **106** is free to move in the forward direction and to each side, however limited to a certain extent by the seat's side portions **104a** and **104b** of the seat headrest **104**.

As shown in Fig. 7F, the child **105** has fallen asleep and thus the head restraint **100** is in the downward position. In this position, the restraining member **140** is disposed in front of a forehead **107** of the child **105** in order restrain the movement of the head **106** in the forward direction. In addition, the headrest member **110** is in its second state in which its side portions are spaced from each other to a second extent which is smaller than the first extent, thereby restraining movement of the head **106** to the sides. This restraint by the restraining member **140** and the side portions of the headrest member **110** provide increased stability and comfortable support of the head **106** while the child **105** sleeps. In particular, the restraining member **140** prevents the user's head **106** from falling forward, and the first and the second side portions 1**20** and **130** prevent the user's head **106** from tilting to the left or the right side. Moreover, the above restraint can provide increased head and neck stability to a user upon turning, braking or collision of the vehicle.

Reference is now made to Figs. 6A to 6F, in order to explain in a detailed manner the structure and manner of operation of the head restraint **100** with the restraining member **140** in its upward position and the headrest member **110** in its first state.

The headrest member **110** has a back portion **112**, a first side portion **120** and a second side portion **130**. The back portion **112** and the first and second side portions **120** and **130** are formed as support cushions for the child's head **106**. As shown in Fig. 6B, the back portion **112** provides support to a back portion **109** of the head **106**.

The first side portion **120** and the second side portion **130** extend from two opposite ends of the back portion **112**, i.e., a first end **113** and a second end **114**,

respectively. Moreover, the first side portion **120** and the second side portion **130** are foldable with respect to the central portion **112** between the first state (Figs. 6A to 6F) and the second state of the headrest member **110** (Figs. 7A to 7F).

The back portion **112** is attached to and integrated with the seat headrest **104** by sewing.

The restraining member **140** is configured with a first side member **150**, a second side member 1**60** and a central member **142** disposed therebetween. The central member **142** is formed as a strap and as shown in Fig. 6F, is disposed above the child's head **106**.

The first side member 1**50** and the second side member **160** are attached to the central member **142** by hoop and loop fasteners. The hoop and loop fasteners allow regulating the length of the restraining member **140** so as to adjust the distance between the child's forehead and the restraining member **140** (in the downward position of the restraining member), the distance between the child's upper portion of the head and the restraining member **140** (in the upward position of the restraining member) and to adjust the head restraint **100** to different sized heads.

Moreover, the hoop and loop fasteners allow regulating the vertical location of the central member **142** with respect to the first and the second side members **150** and **160**. For example, if the user of the head restraint **100** wants to use the central member **142** as a sleep mask, he can position the central member **142** with respect to the first and the second side members **150** and **160** so that the central member **142** is located in front of his eyes, instead of his forehead.

Pivotal articulation of the restraining member **140** to the headrest member **110** is provided by articulation of the first side member **150** to an exterior face **122** (shown in Fig. 8) of the first side portion **120** by means of a first snap fastener **154** (shown in Fig. 8), and by articulation of the second side member **160** to an exterior face **132** of the second side portion **130**, by means of a second snap fastener **164**.

The first side portion **120** is configured with a first delimiting channel **152** (shown in Fig. 8) formed at the exterior face **122**, and the second side portion **130** is configured with a second delimiting channel **162** formed at the exterior face **132**. The first delimiting channel **152** is formed within a channel element **151** which is mounted

to the exterior face **122**. The second delimiting channel **162** is formed within a channel element **161** which is mounted to the exterior face **132**. According to the particular example, the channel elements **151** and **161** of the exterior faces **122** and **132** are related to a single element by being connected by a connecting strip (seen in Fig. 8).

The first delimiting channel **152** and the second delimiting channel **162** are arced shaped, the length of which corresponds to the angle between the headrest member **110** and the restraining member **140** between its upward and downward positions. According to the present example, this angle is about 120º.

As can be seen in Fig. 8, the first side member **150** is configured with a first projecting portion **155** which is received and slidingly displaceable within the first delimiting channel **152** between two extreme ends thereof upon displacement of the restraining member **140** between its upward and downward positions.

As shown in Figs. 6A and 6C, the second side member **160** is configured with a second projecting portion **165** which is received and slidingly displaceable within the second delimiting channel **162** between a lower end **166** and an upper end **167** upon displacement of the restraining member **140** between the upward and downward positions, respectively. The lower end **166** restricts further upward pivoting of the restraining member **140** beyond its upward position, and the upper end **167** restricts further downward pivoting of the straining member **140** beyond its downward position, thereby, for example, preventing the central member **142** to be located lower than a predetermined level, e.g., in front of the child's eyes.

The central member **142** is formed of a flexible and soft material. This material is rigid though pliable. The headrest member **110** is formed of flexible and soft cushioning material. The first side member **150**, the second side member **160**, the two channel elements **151** and **161**, are all made of a hard and a rigid though pliable plastic material. According to the present example, this material is polymer, and in particular, polypropylene.

It should be indicated that according to other examples, the headrest member **110** is not necessarily flexible, but in any case should allow pivoting of its side portions.

As indicated above, the headrest member **110** is shown in Figs. 6A to 6F in its first state. At this state, the first side portion **120** and the second side portion **130** are

spaced from each other at a first extent represented by a distance **D3** (Figs. 6B and 6D). The distance **D3** is taken along an axis that is parallel to the axis of rotation **X** and passes through a central point **106'** of the head **106**. The first state of the headrest member **110** is in its normal state to which the side portions of the headrest member **110** tend to revert. The normal state is provided due to the geometry and the structure of the headrest member **110**.

The restraining member **140** is structured so that the distance between the first and the second side members **150** and **160** is substantially constant during the pivoting of the restraining member **140** between its upward and downward positions. In light of this characteristic of the restraining member **140**, and the fact that the distance between the first and the second side members **150** and **160** is smaller than the distance between the external faces **122** and **132** at the upward configuration of the restraining member **140**, displacement of the restraining member **140** from its upward position to its downward position causes the headrest member **110** to assume its second state. This result is provided by the first and the second side members **150** and **160**, which bend the first and the second side portions **120** and **130** with respect to the back portion **112**, respectively, causing them to approach each other. Likewise, displacement of the restraining member **140** from its downward position to its upward position causes the headrest member **110** to assume its normal first state.

Reference is now made to Figs. 7A to 7F, in order to explain in a detailed manner the structure and manner of operation of the head restraint **100** with the restraining member **140** in its downward position and the headrest member **110** in its second state.

As shown in Fig. 7B, in the downward position of restraint member **140**, its central member **142** is located in front of the forehead **107** of the child's head **106**, and spaced therefrom so that a gap **m'** extends between the central member **142** and the forehead **107**. The gap **m'** provides an extra measure of comfort to the child **105**, since when the child **105** is awake, there is no contact between the forehead **107** and the restraining member **140**. However, the gap should not be too great in order to allow the restraining member **140** to effectively operate when the contact between the forehead

107 and the central member **142** is established. This contact may be established if the child's head **106** will fall in the forward direction when she falls asleep.

In addition, as shown in Figs. 7B, the first and the second side portions **120** and **130** provide support to the sides **108** and **108'** of the child's head (in Fig. 7B). The first and the second side portions **120** and **130** further constitute a side impact protector for the user's head **106**.

As indicated above, the headrest member **110** is shown in Figs. 7A to 7F in its second state. At this state, the first side portion **120** and the second side portion **130** are spaced from each other at a second extent represented by a distance **D4** (shown in Figs. 7B and 7D), which is smaller than the distance **D3**. The distance **D4** is taken along an axis that is parallel to the axis of rotation **X** and passes through the central point **106'** of the head **106**. As shown in Fig. 7B, the first and the second side portions **120** and **130** are disposed in proximity to the user's temples, thereby reducing noise that approaches the child's ears and improving the quality of her sleep.

The distance **D4** can be regulated by changing the length of the restraining member **140**. For example, if the child feels discomfort with the first and the second side portions touching his ears, the length of the restraining member **140** can be increased, thereby increasing the distance **D4**.

CLAIMS:

1. A head restraint comprising:

a headrest member configured with a back portion and two side portions extending therefrom;

a mounting arrangement articulated to the headrest member for mounting the head restraint to a seat; and

a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position.

2. A head restraint according to Claim 1, wherein the side portions are foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

3. A head restraint according to Claim 1, wherein displacement of the restraining member between its upward position and its downward position is configured to cause the headrest member to assume its first and second states, respectively.

4. A head restraint according to any one of Claims 1 to 3, wherein in the downward position, the restraining member is spaced from a forehead of a user so that a gap extends between the forehead and the restraining member.

5. A head restraint according to any one of the preceding claims, wherein the restraining member is configured with two side members and a central member disposed therebetween; and wherein one of said side members is pivotally articulated to an exterior face of one of said side portions, and another one of the side members is pivotally articulated to an exterior face of another one of the side portions.

6. A head restraint according to Claim 5, wherein each of the side portions is configured with a delimiting channel formed at its exterior face, and each of the side members is configured with a projecting portion configured to be received within its respective delimiting channel and displaced between two extreme ends thereof upon displacement of the restraining member between the upward and downward positions.

7. A head restraint according to Claim 6, wherein the delimiting channels are characterized by a shape of an arc, the length of which corresponds to the angle between the headrest member and the restraining member in its upward and downward positions.

8. A head restraint according to any one of the preceding claims, wherein the head restraint is modular and has two configurations: a frontal configuration in which the restraining member is pivotally mounted to the headrest member to be displaced between its upward and downward positions; and a rear configuration in which the restraining member is disposed at the rear side of the headrest member and connected thereto; at the rear configuration, the restraining member substantially entirely engages an exterior face of the headrest member and the head restraint is configured to be packed by being rolled or folded.

9. A head restraint according to any one of the preceding claims, wherein the restraining member has a varying length so as to: adjust the distance between a user's forehead and the restraining member, adjust the distance between the upper portion of a user's head and the restraining member, and adjust the head restraint to different sized heads.

10. A head restraint according to any one of the preceding claims, wherein the mounting arrangement is configured for attaching the head restraint to a seat headrest of a seat.

11. A head restraint comprising:

a headrest member configured with a back portion and two side portions extending therefrom; and

a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position;

wherein the side portions of the headrest member are foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

12. A head restraint according to Claim 11, further comprising a mounting arrangement articulated to the headrest member for mounting the head restraint to a seat.

13. A head restraint according to Claim 11 or 12, wherein displacement of the restraining member between its upward position and its downward position is configured to cause the headrest member to assume its first and second states, respectively.

14. A head restraint according to any one of Claims 11 to 13, wherein in the downward position, the restraining member is spaced from a forehead of a user so that a gap extends between the forehead and the restraining member.

15. A head restraint according to any one of Claims 11 to 14, wherein the restraining member is configured with two side members and a central member disposed therebetween; and wherein one of said side members is pivotally articulated to an exterior face of one of said side portions, and another one of the side members is pivotally articulated to an exterior face of another one of the side portions.

16. A head restraint according to Claim 15, wherein each of the side portions is configured with a delimiting channel formed at its exterior face, and each of the side

members is configured with a projecting portion configured to be received within its respective delimiting channel and displaced between two extreme ends thereof upon displacement of the restraining member between the upward and downward positions.

17. A head restraint according to Claim 16, wherein the delimiting channels are characterized by a shape of an arc, the length of which corresponds to the angle between the headrest member and the restraining member in its upward and downward positions.

18. A head restraint according to any one of Claims 11 to 17, wherein the head restraint is modular and has two configurations: a frontal configuration in which the restraining member is pivotally mounted to the headrest member to be displaced between its upward and downward positions; and a rear configuration in which the restraining member is disposed at the rear side of the headrest member and connected thereto; at the rear configuration, the restraining member substantially entirely engages an exterior face of the headrest member and the head restraint is configured to be packed by being rolled or folded.

19. A head restraint according to any one of Claims 11 to 18, wherein the restraining member has a varying length so as to: adjust the distance between a user's forehead and the restraining member, adjust the distance between the upper portion of a user's head and the restraining member, and adjust the head restraint to different sized heads.

20. A seat comprising:

(a) a seating portion;

(b) a seat headrest; and

(c) a head restraint comprising a headrest member configured with a back portion attached to the seat headrest and two side portions extending therefrom; and a restraining member pivotally articulated to said side portions and configured for rotation at least between an upward position and a downward position;

wherein the side portions of the headrest member are foldable with respect to the back portion so as to allow the headrest member to assume a first state in which the side portions are spaced from each other at a first extent and a second state in which the side portions are spaced from each other to a second extent which is smaller than said first extent.

21. A head restraint according to Claim 20, wherein displacement of the restraining member between its upward position and its downward position is configured to cause the headrest member to assume its first and second states, respectively.

22. A seat according to Claim 20 or 21, wherein in the downward position, the restraining member is spaced from a forehead of a user so that a gap extends between the forehead and the restraining member.

23. A seat according to any one of Claims 20 to 22, wherein the restraining member is configured with two side members and a central member disposed therebetween; and wherein one of said side members is pivotally articulated to an exterior face of one of said side portions, and another one of the side members is pivotally articulated to an exterior face of another one of the side portions.

24. A head restraint according to Claim 23, wherein each of the side portions is configured with a delimiting channel formed at its exterior face, and each of the side members is configured with a projecting portion configured to be received within its respective delimiting channel and displaced between two extreme ends thereof upon displacement of the restraining member between the upward and downward positions.

25. A head restraint according to Claim 24, wherein the delimiting channels are characterized by a shape of an arc, the length of which corresponds to the angle between the headrest member and the restraining member in its upward and downward positions.

26. A seat according to any one of Claims 20 to 25, wherein the restraining member has a varying length so as to: adjust the distance between a user's forehead and the restraining member, adjust the distance between the upper portion of a user's head and the restraining member, and adjust the head restraint to different sized heads.

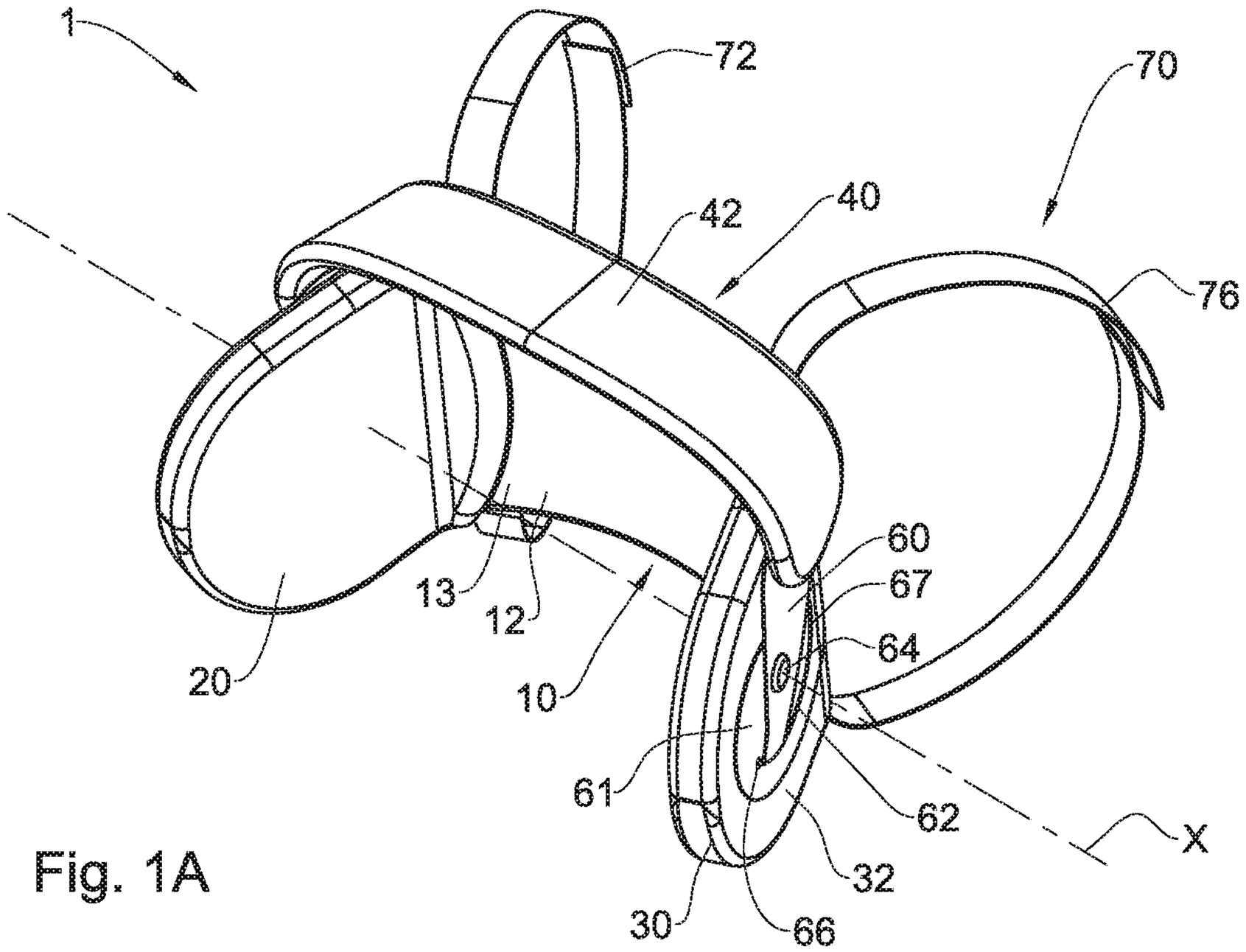

1
72
70
42
40
76
60
67
64
13
12
20
10
61
62
X
32
30
66

Fig. 1A

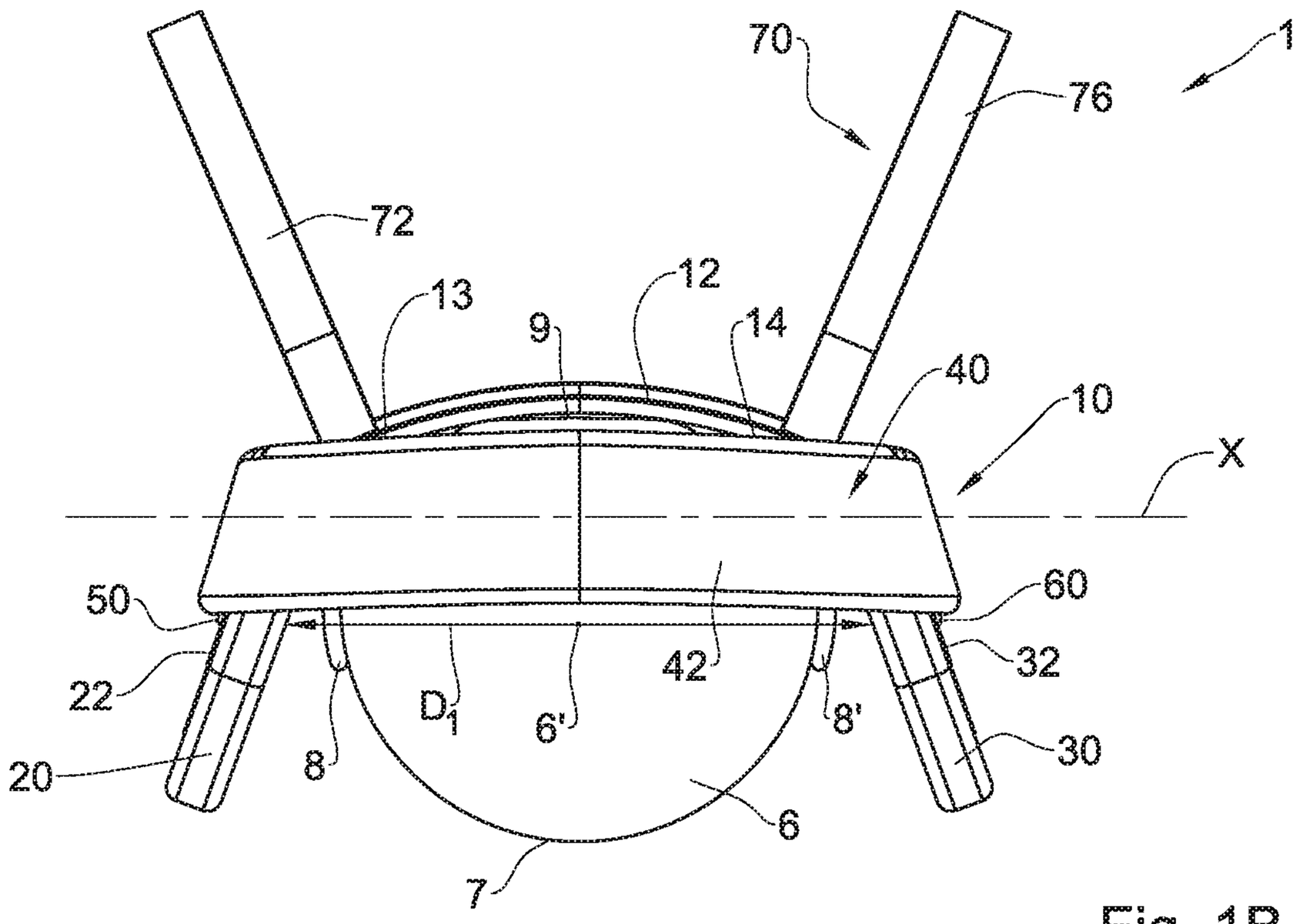

70
1
76
72
13
12
9
14
40
10
X
50
60
22
42
32
D_1
6'
8'
20
8
30
6
7

Fig. 1B

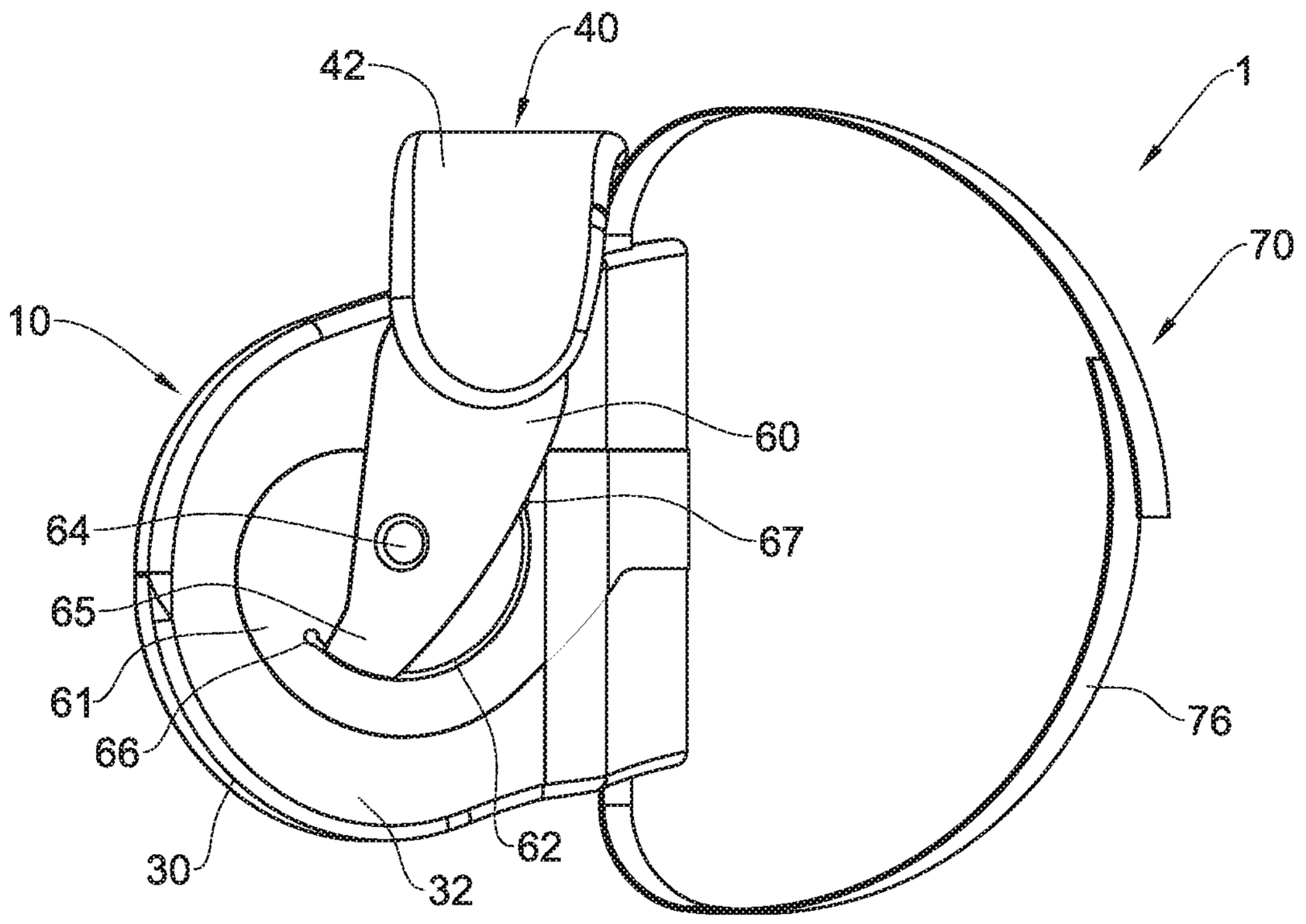

40
42
1
70
10
60
64
67
65
61
66
76
30
32
62

Fig. 1C

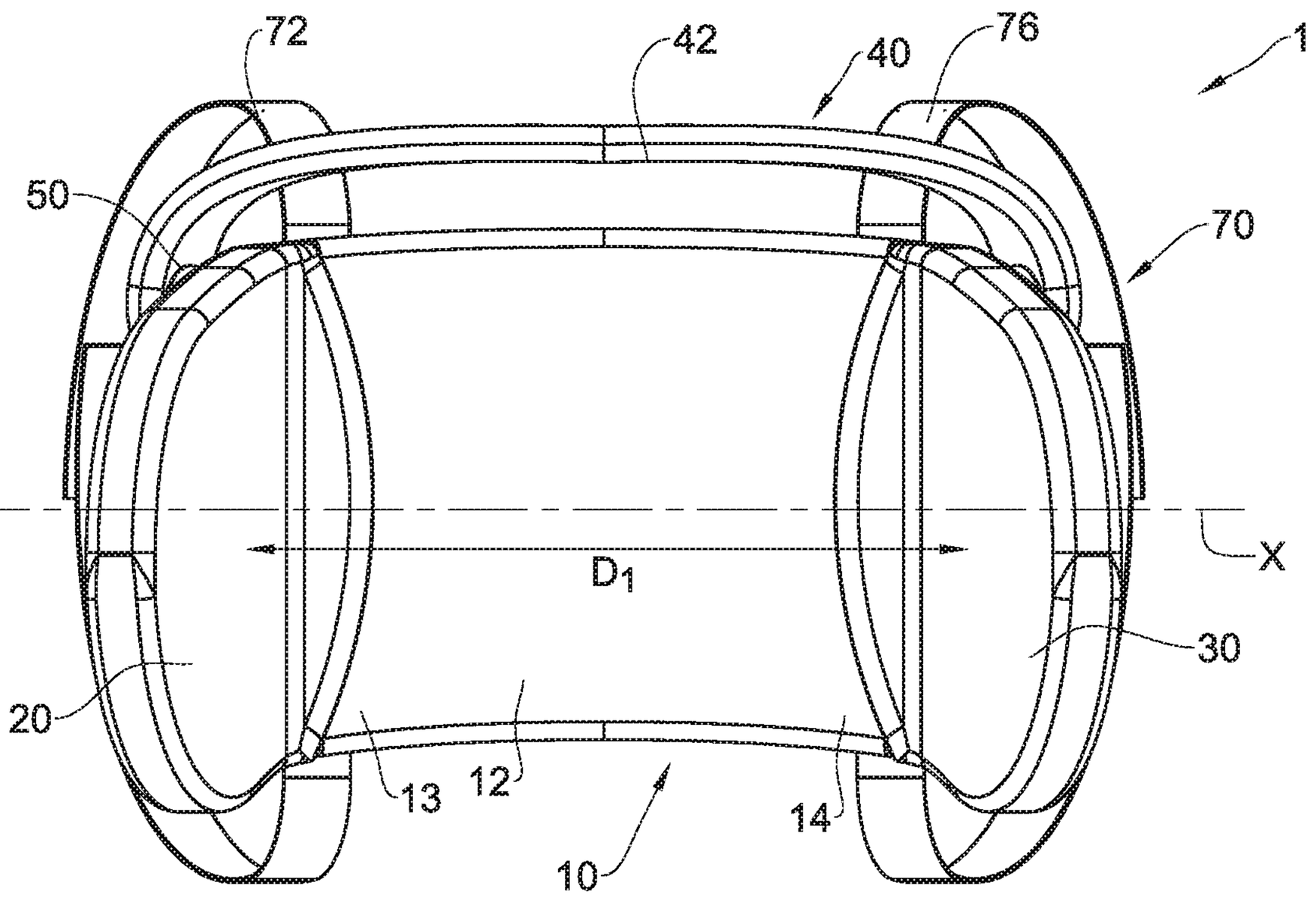

72
42
40
76
1
50
70
X
D_1
30
20
13
12
14
10

Fig. 1D

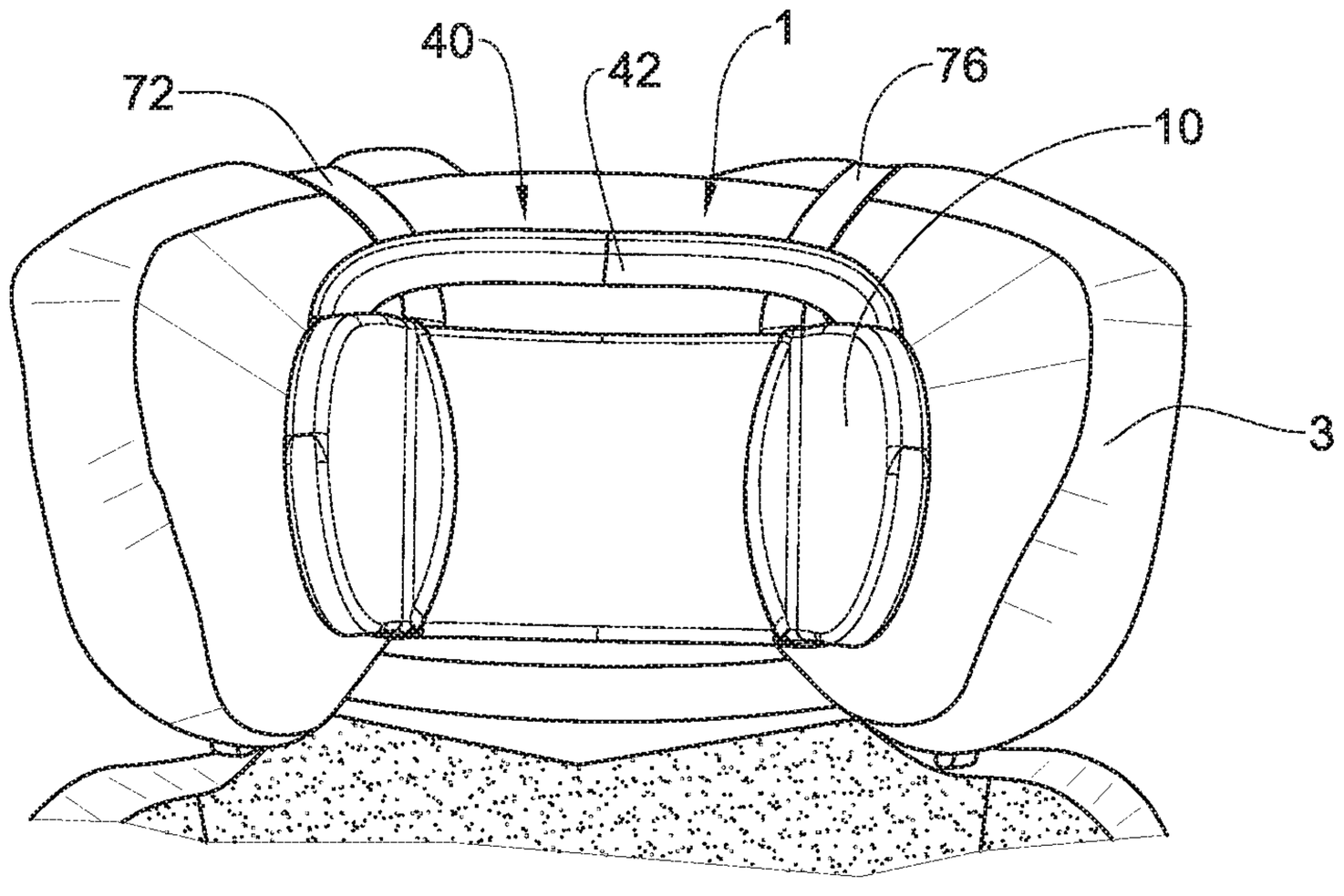


Fig. 1E

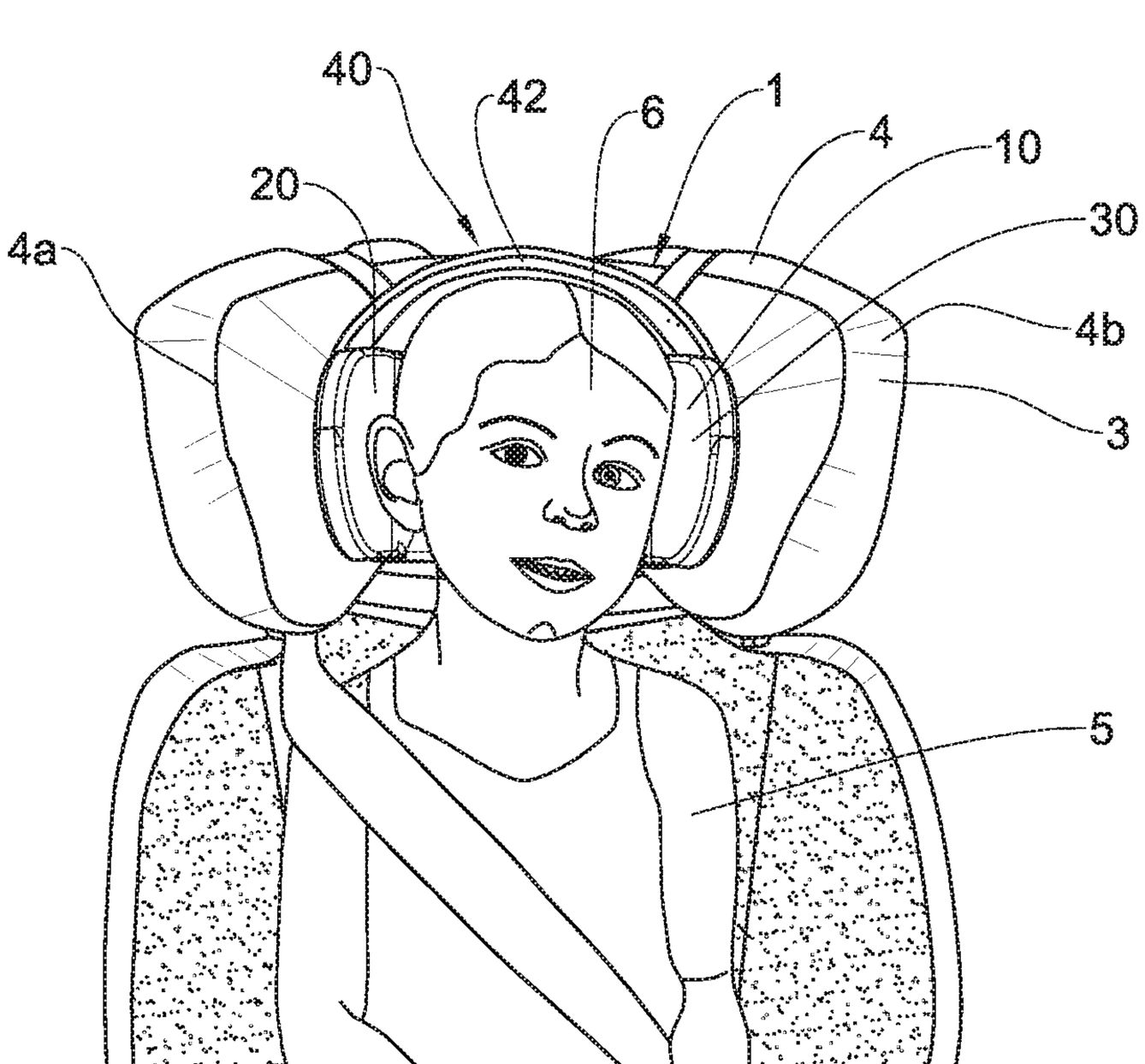


Fig. 1F

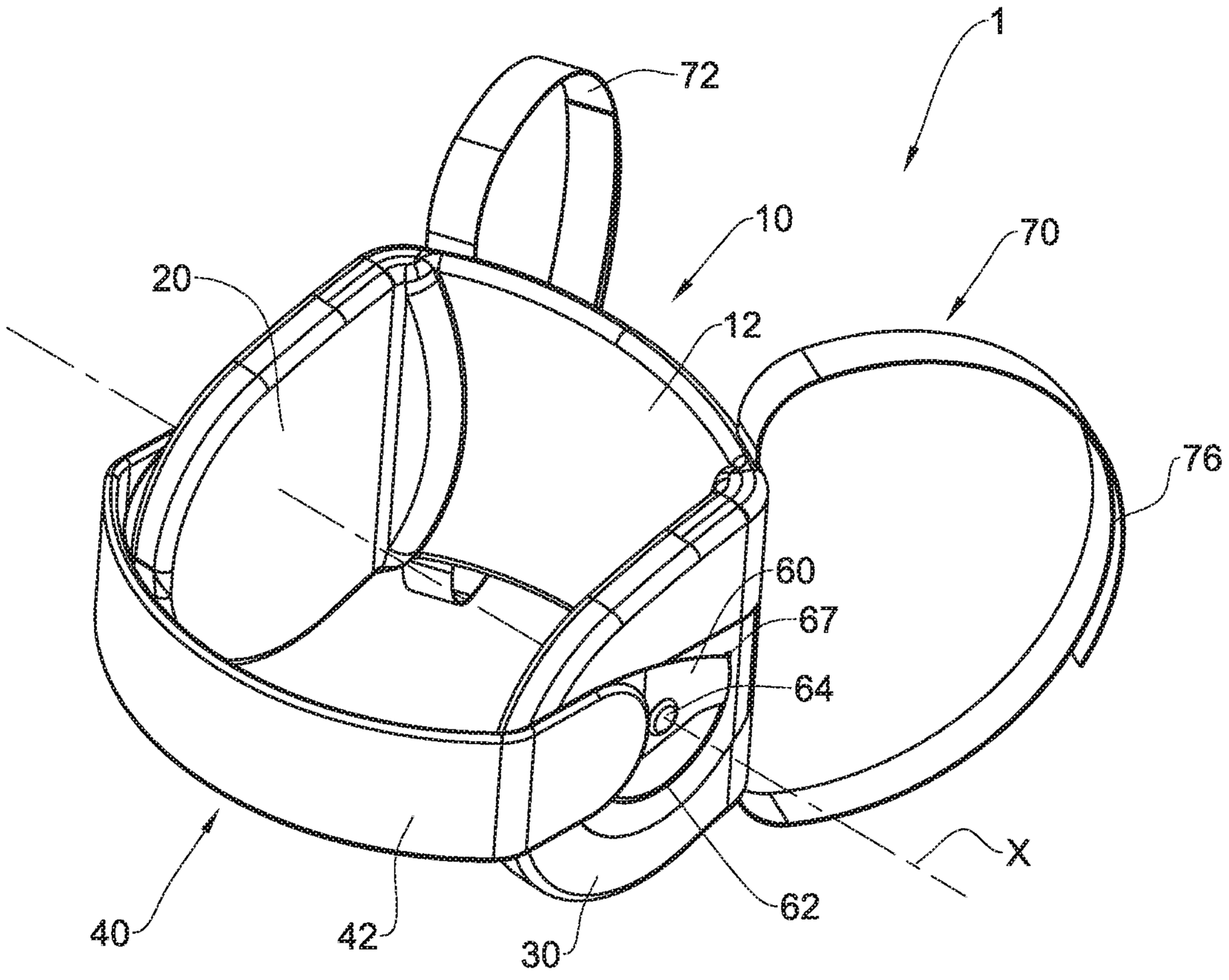


Fig. 2A

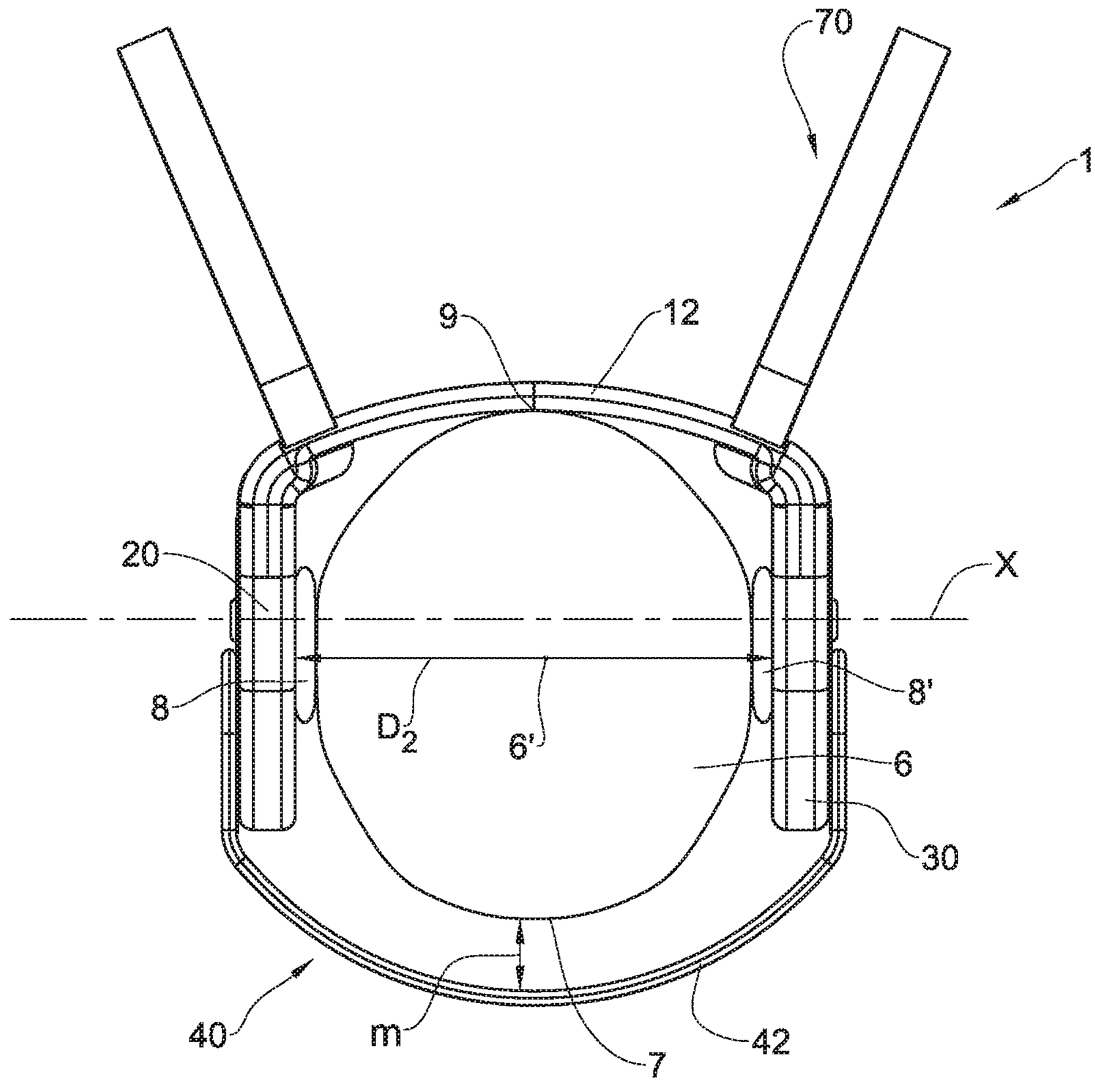


Fig. 2B

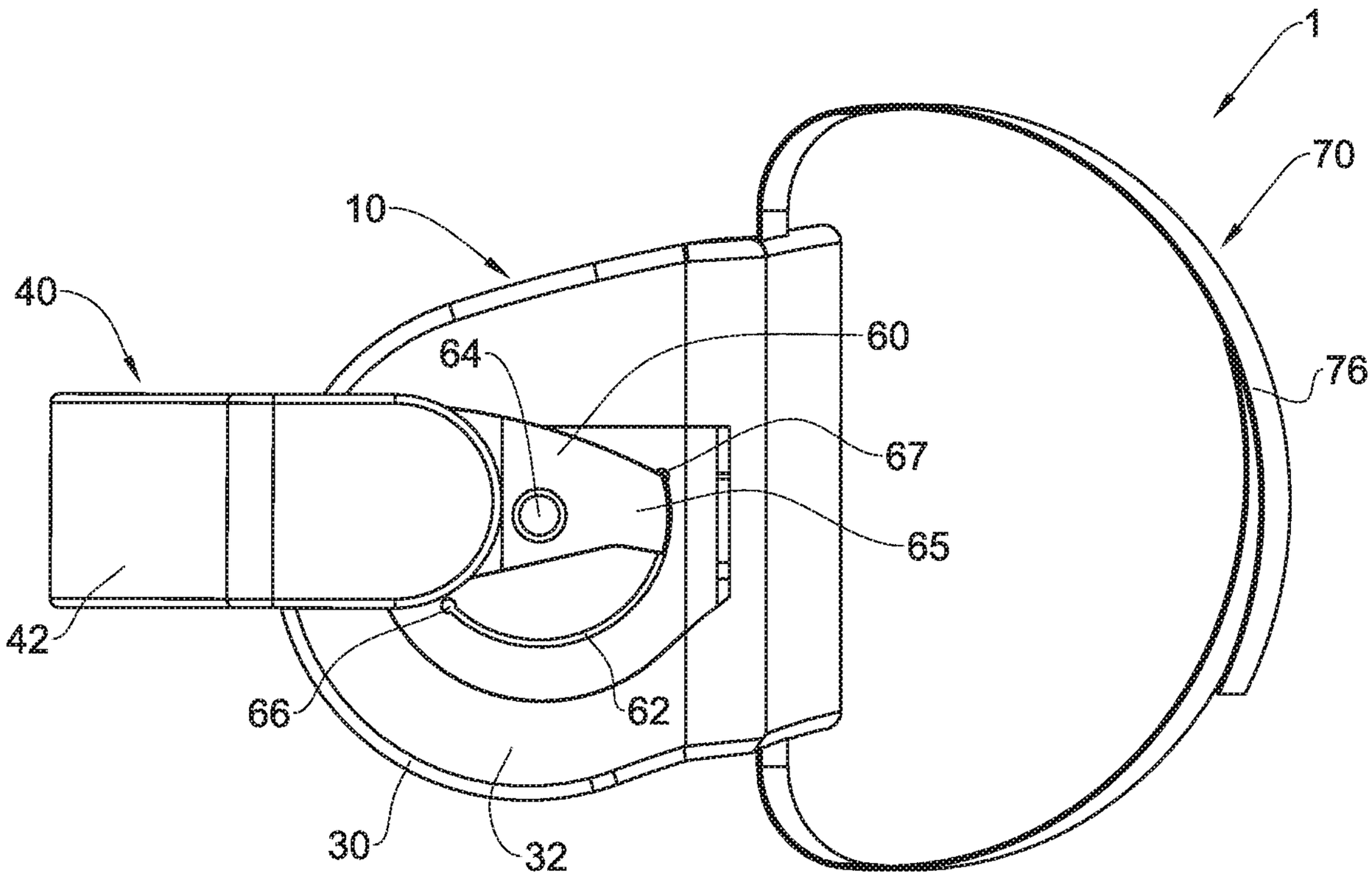


Fig. 2C

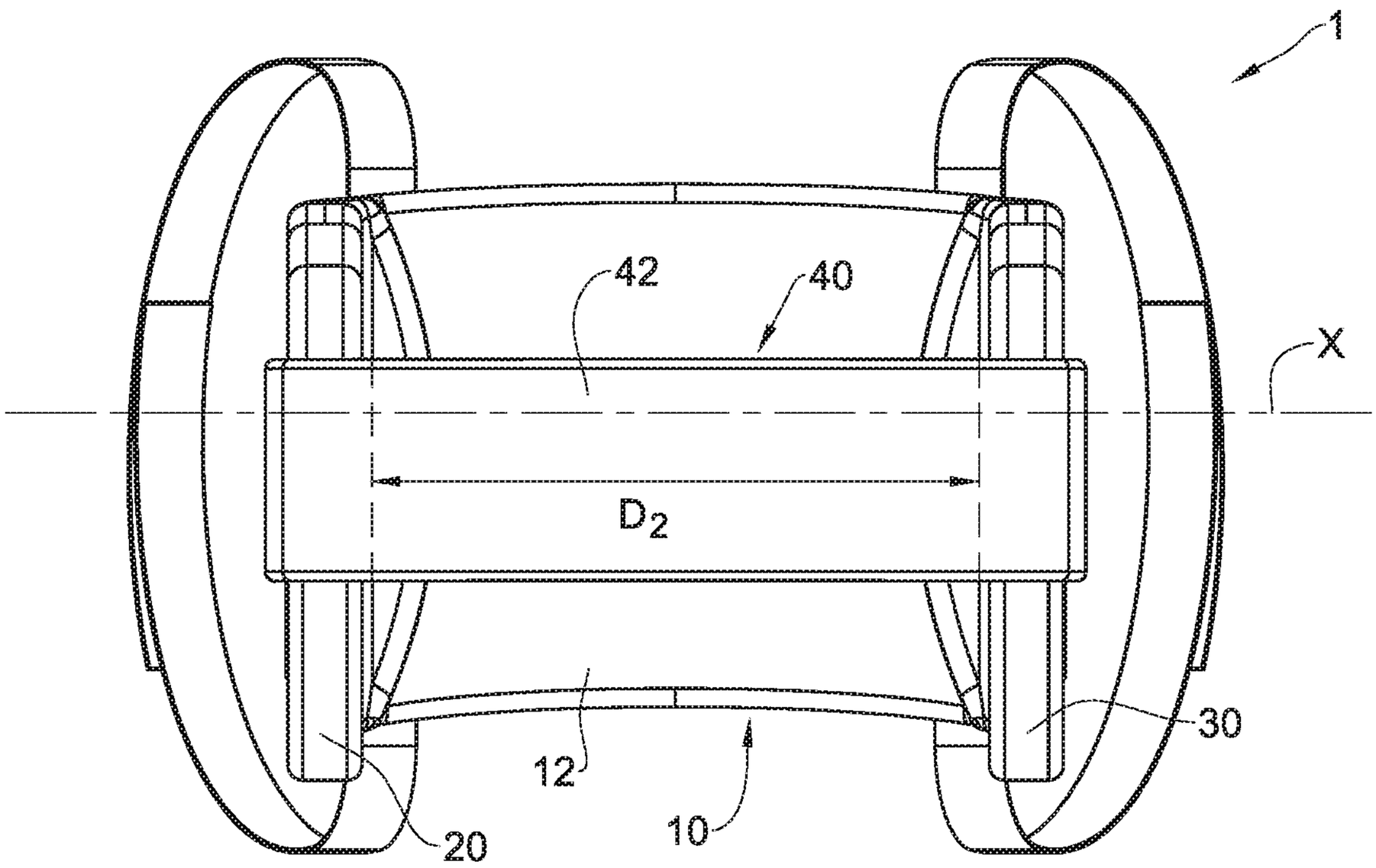


Fig. 2D

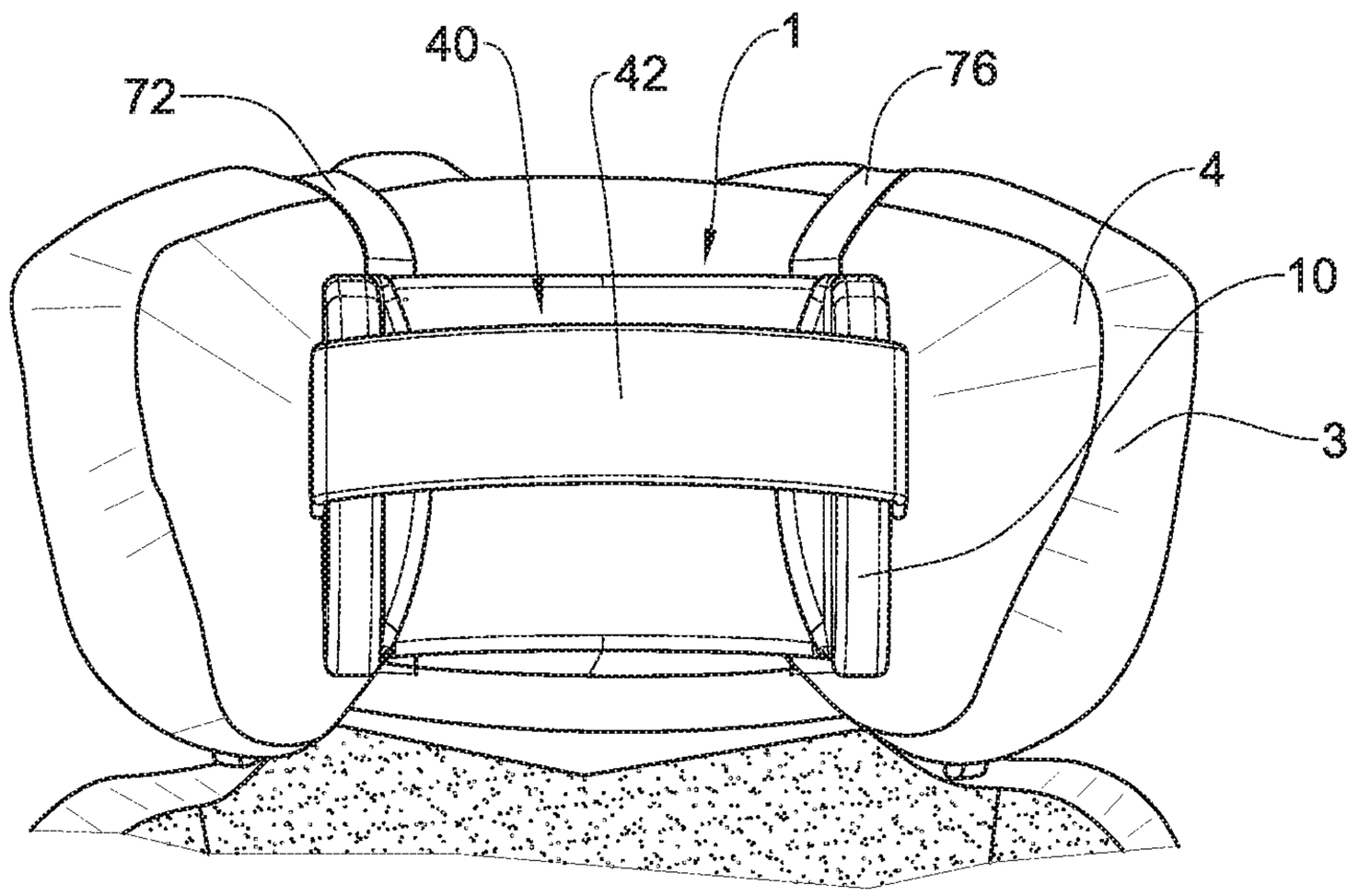


Fig. 2E

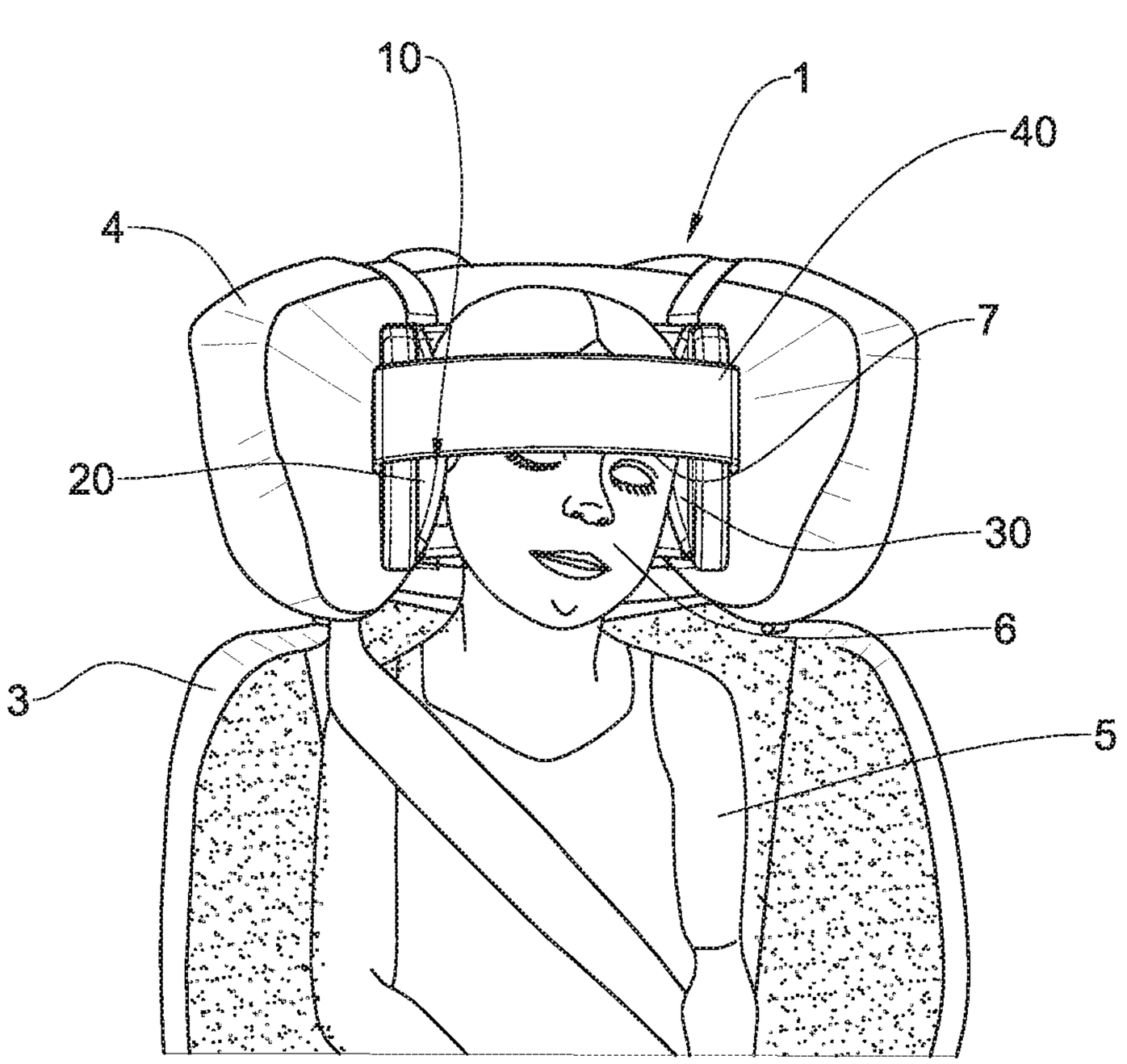


Fig. 2F

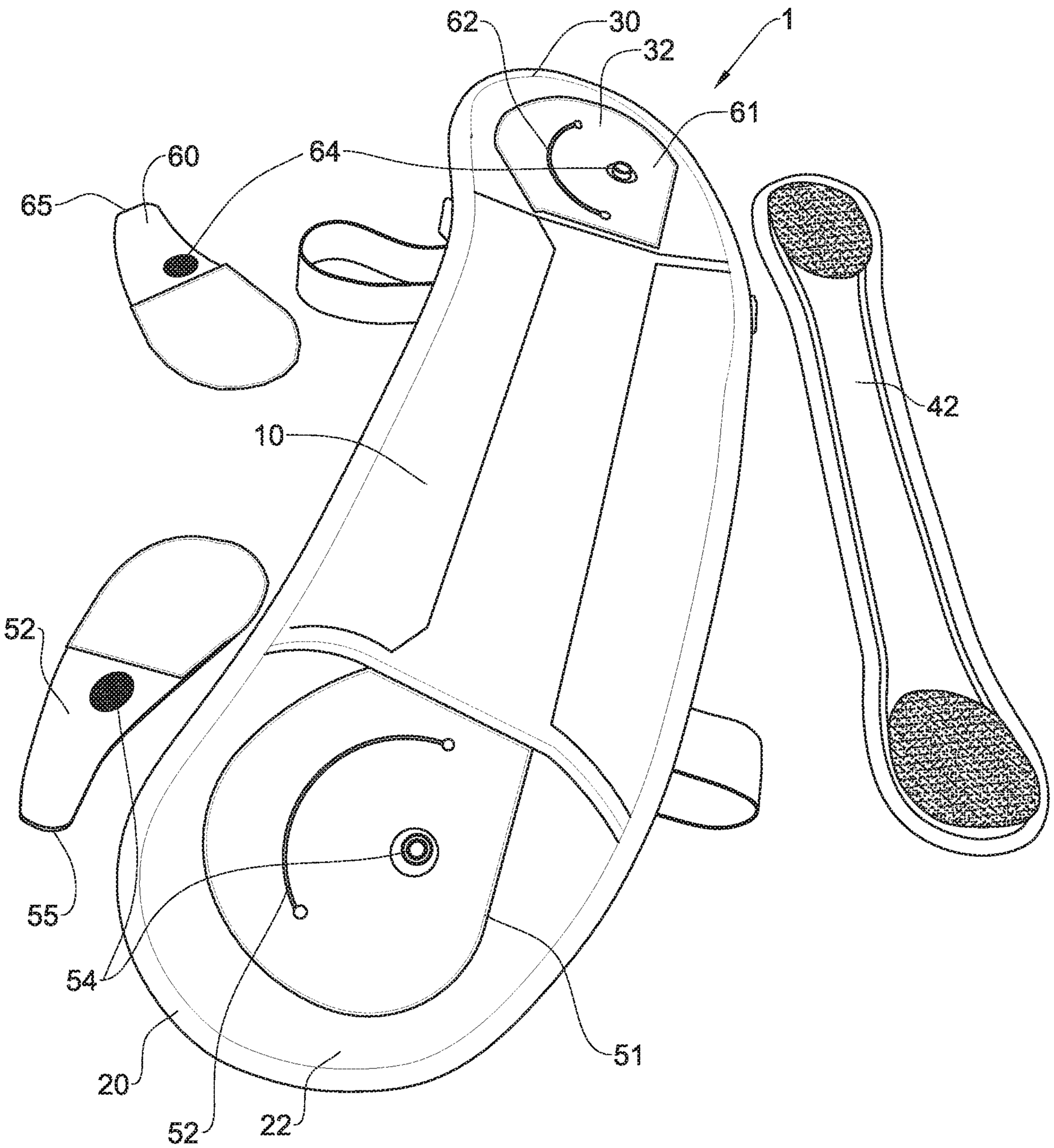


Fig. 3

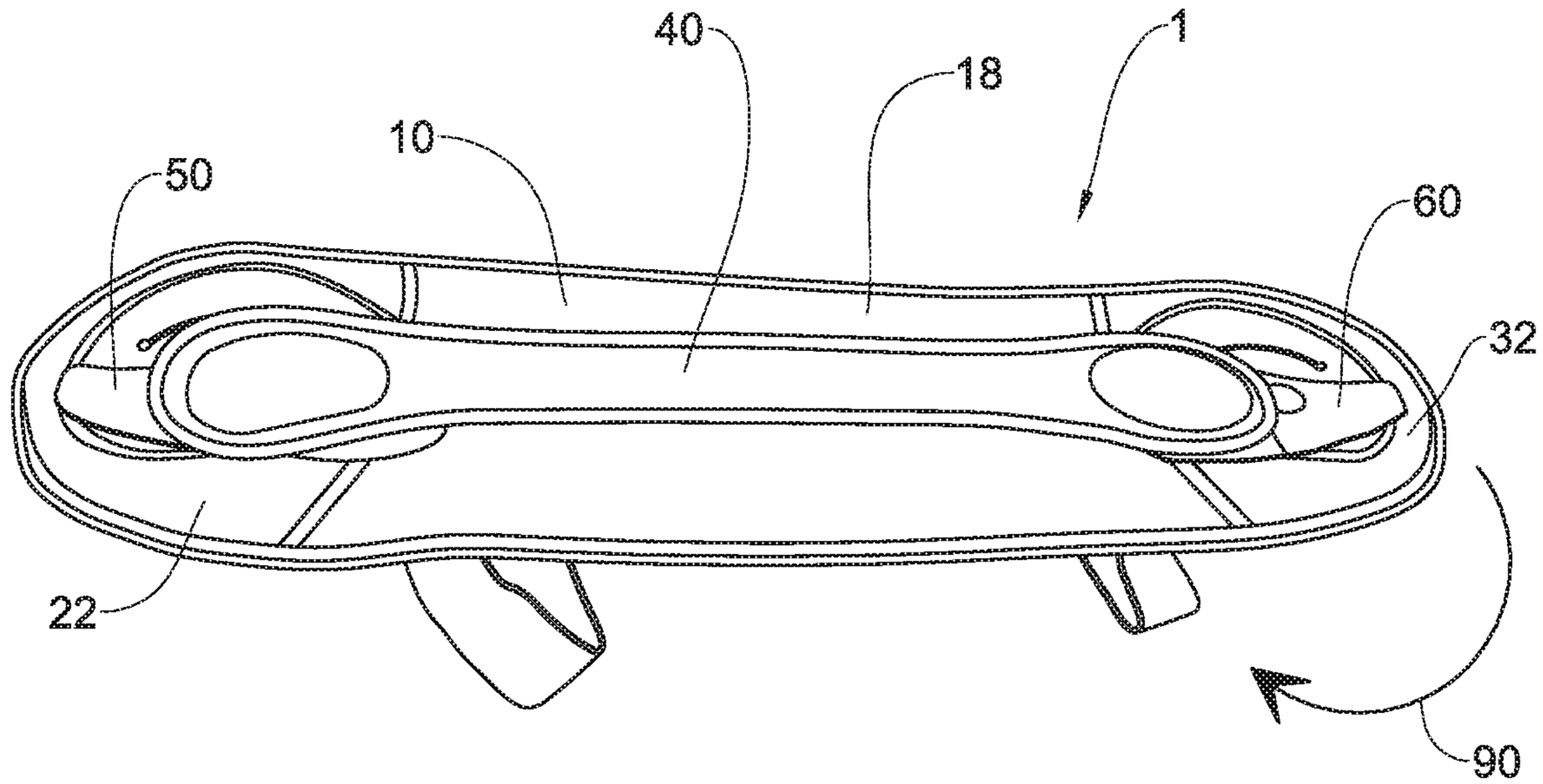


Fig. 4A

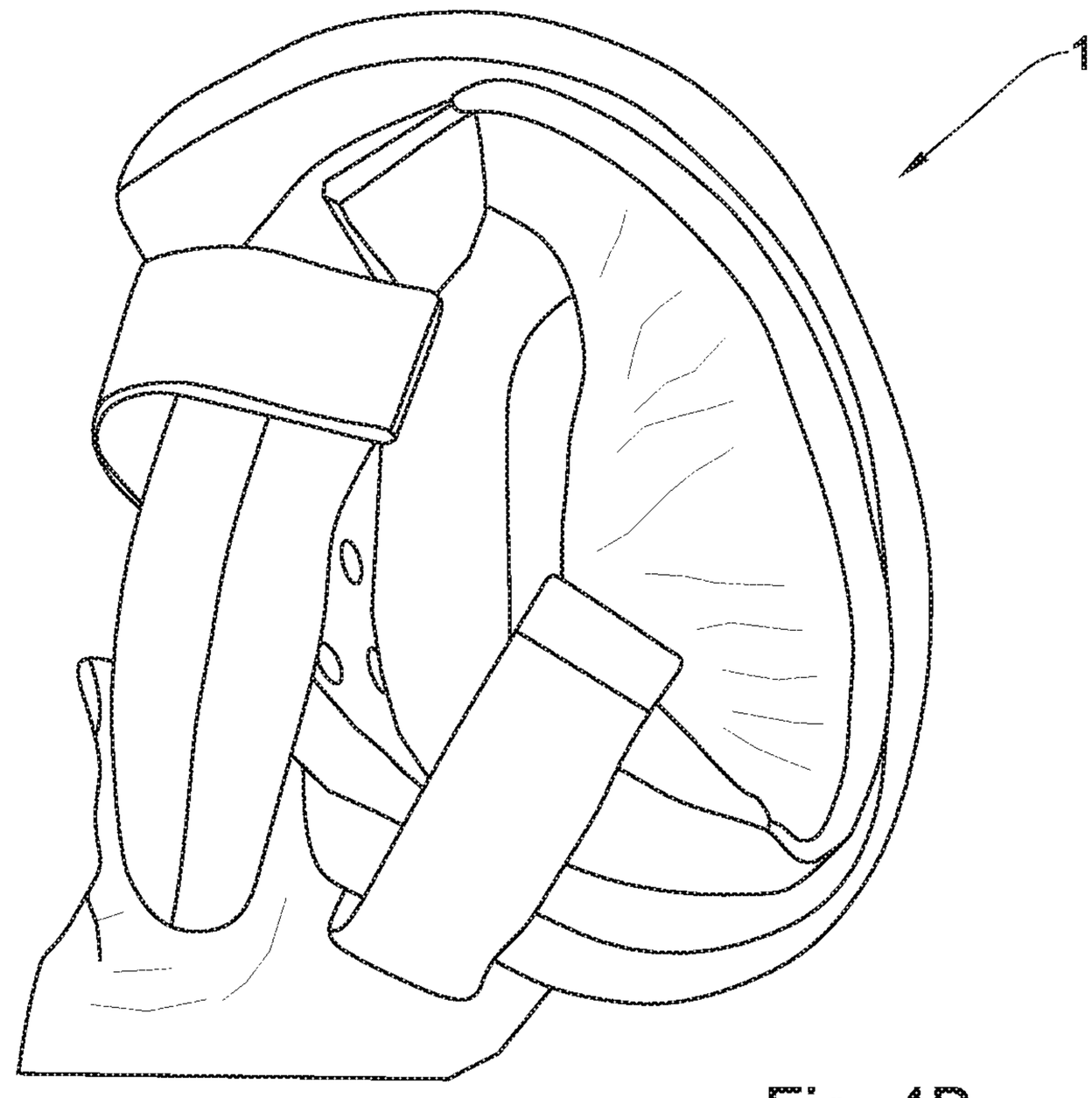


Fig. 4B

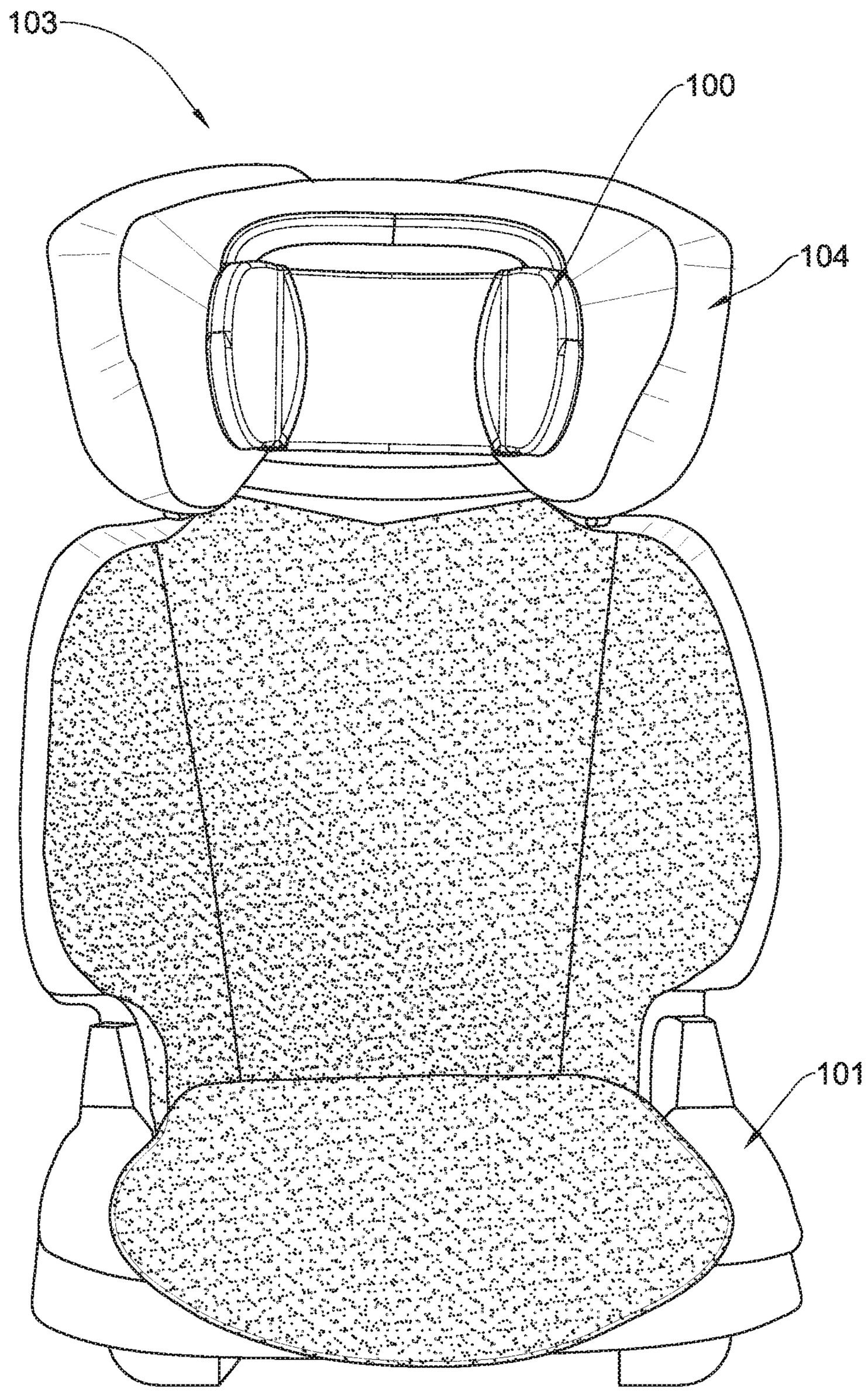


Fig. 5

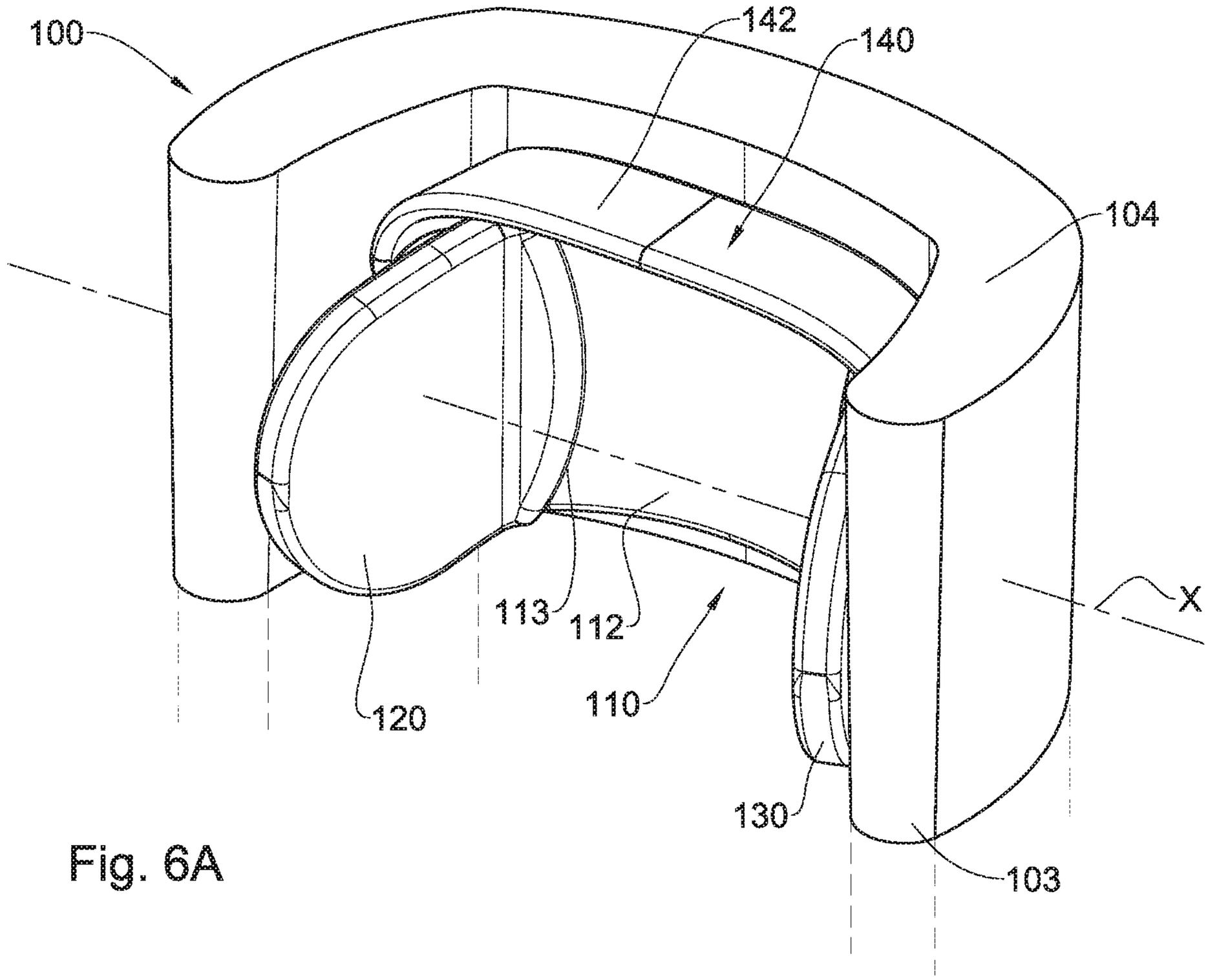

100
142
140
104
X
113
112
110
120
130
103

Fig. 6A

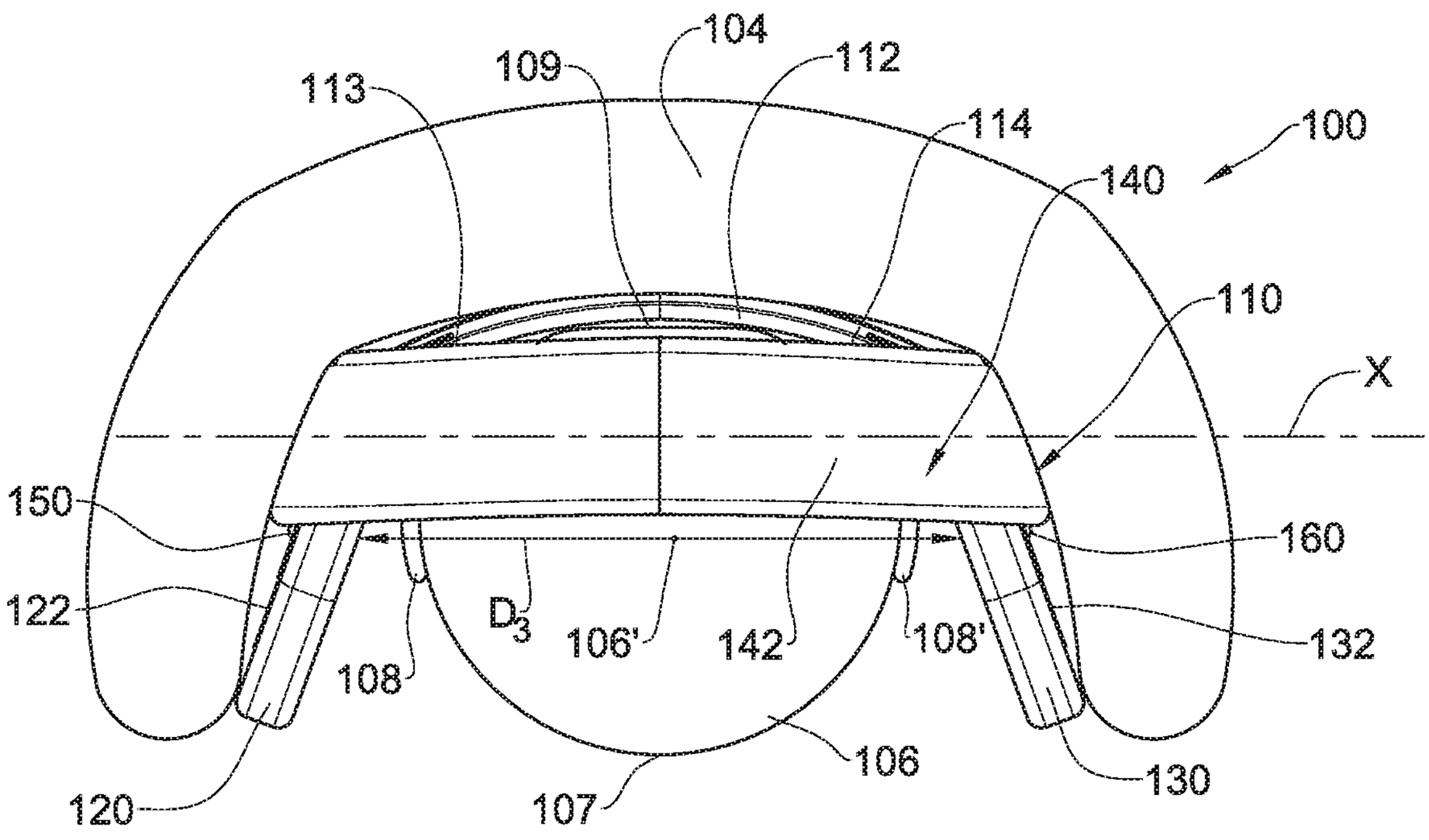

104
109
113
112
114
100
140
110
X
150
160
122
D_3
106'
142
108'
132
108
106
120
107
130

Fig. 6B

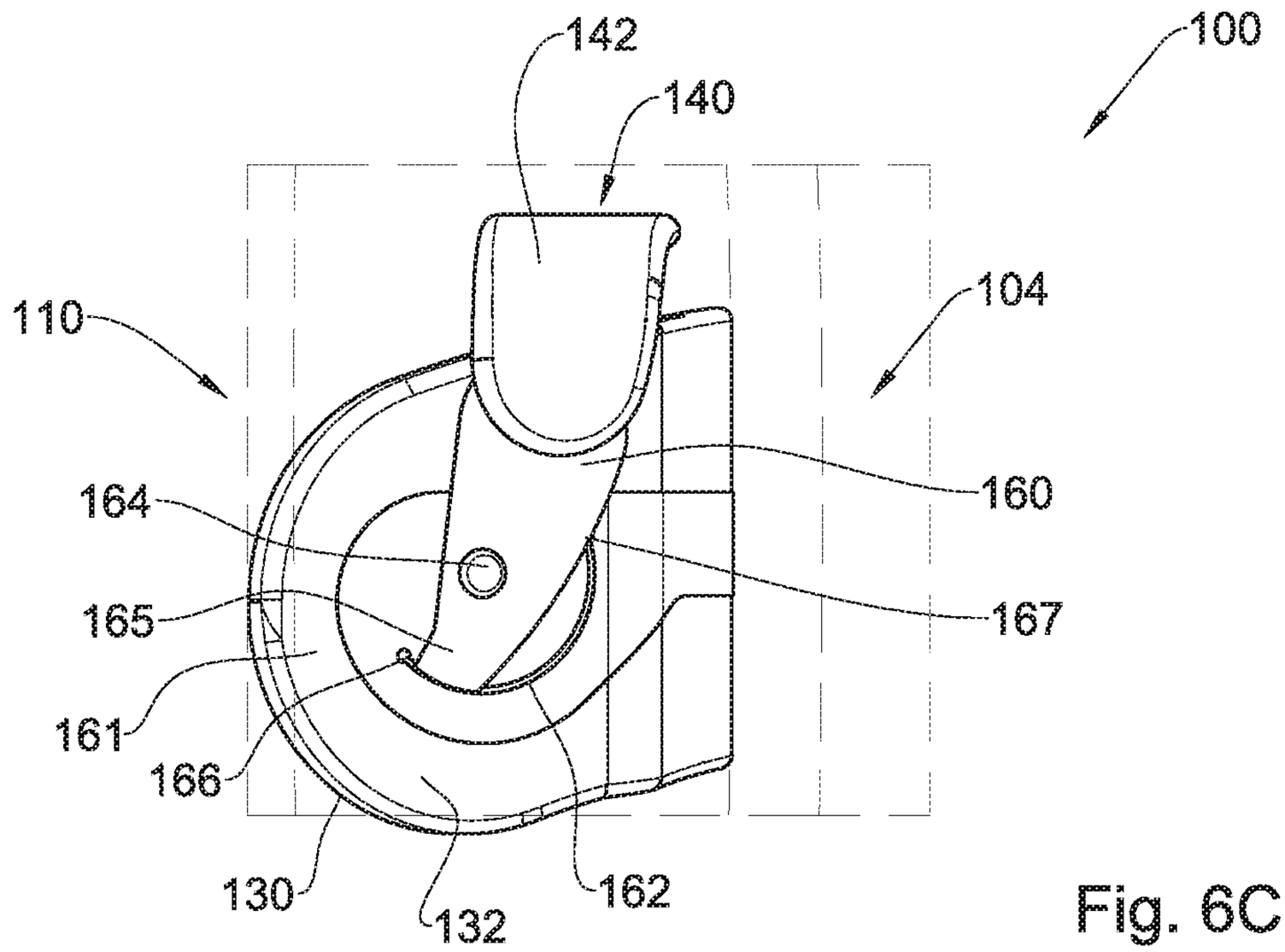

142
140
100
110
104
164
160
165
167
161
166
130
132
162

Fig. 6C

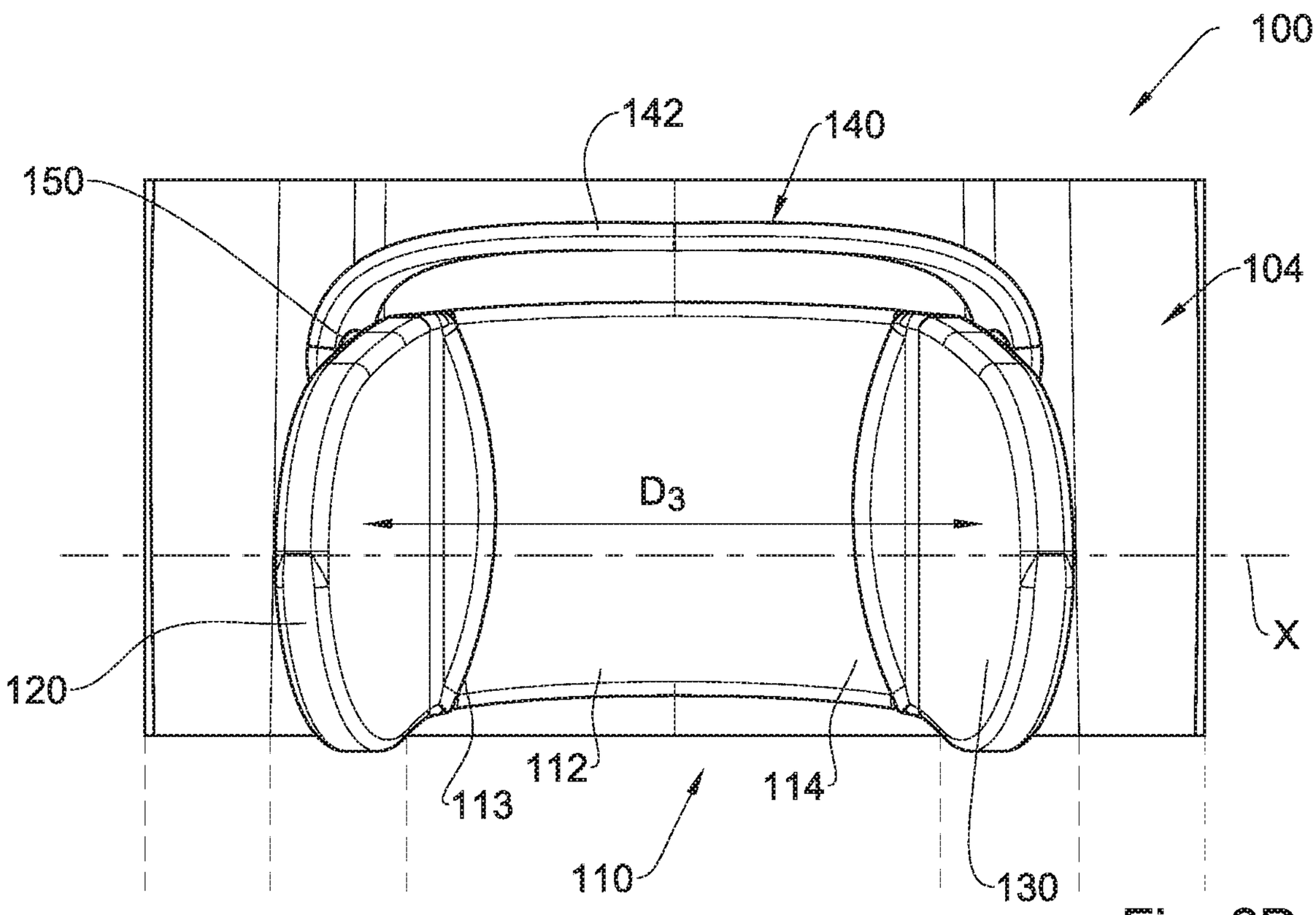

100
142
140
150
104
D_3
X
120
112
113
114
110
130

Fig. 6D

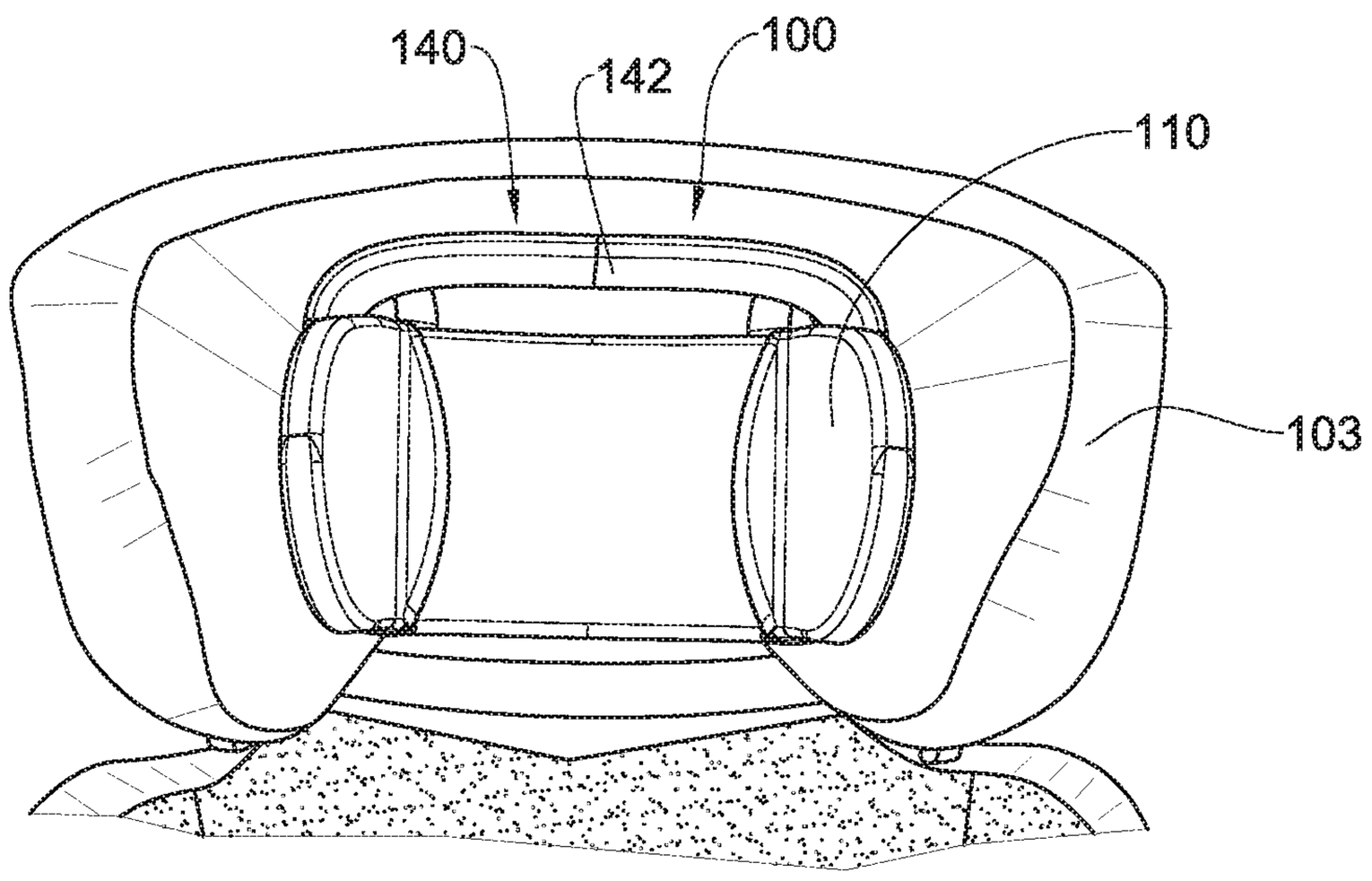

140
142
100
110
103

Fig. 6E

140
142
106
100
110
120
130
104a
104b
104
105
103

Fig. 6F

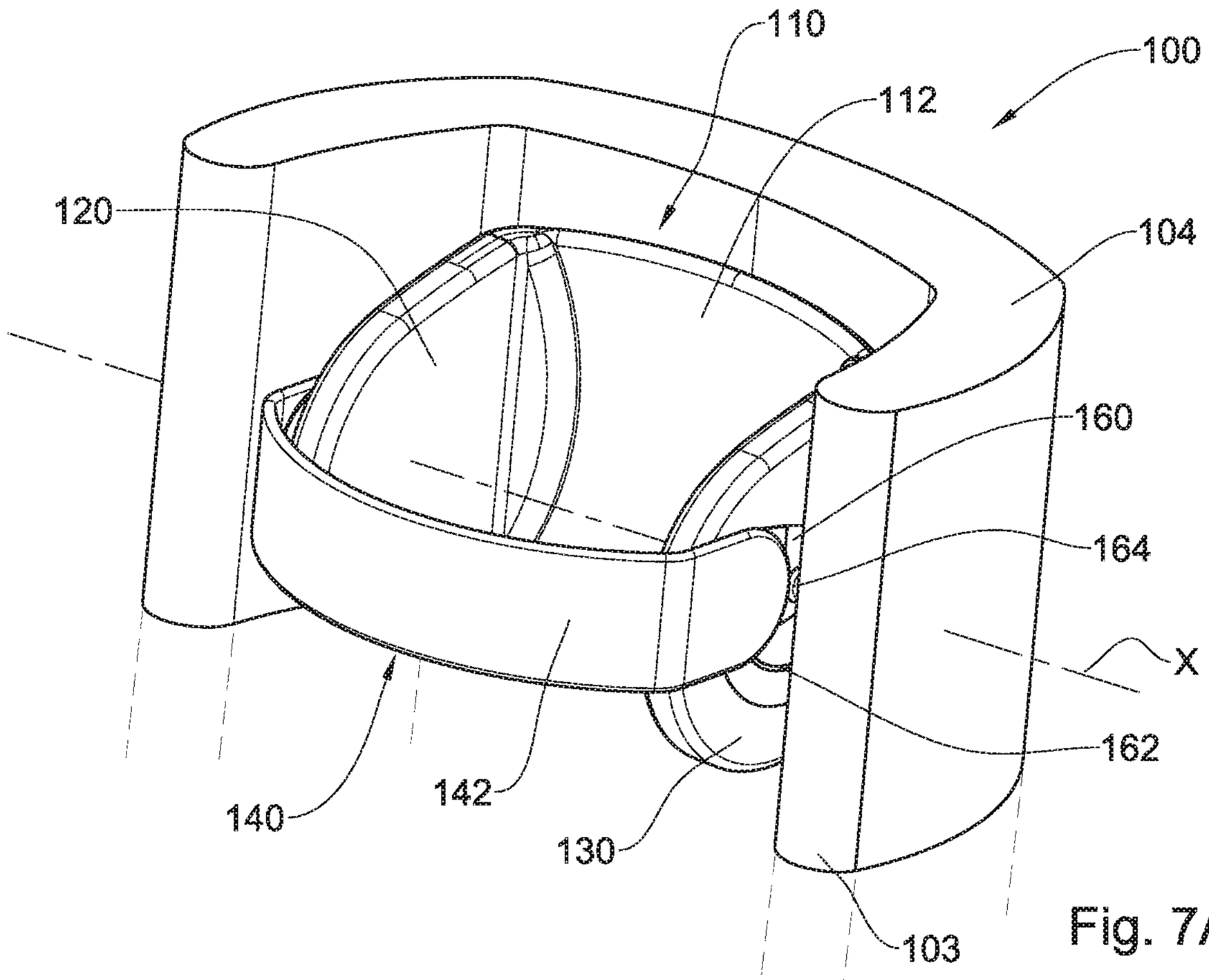

110
100
112
120
104
160
164
X
162
140
142
130
103

Fig. 7A

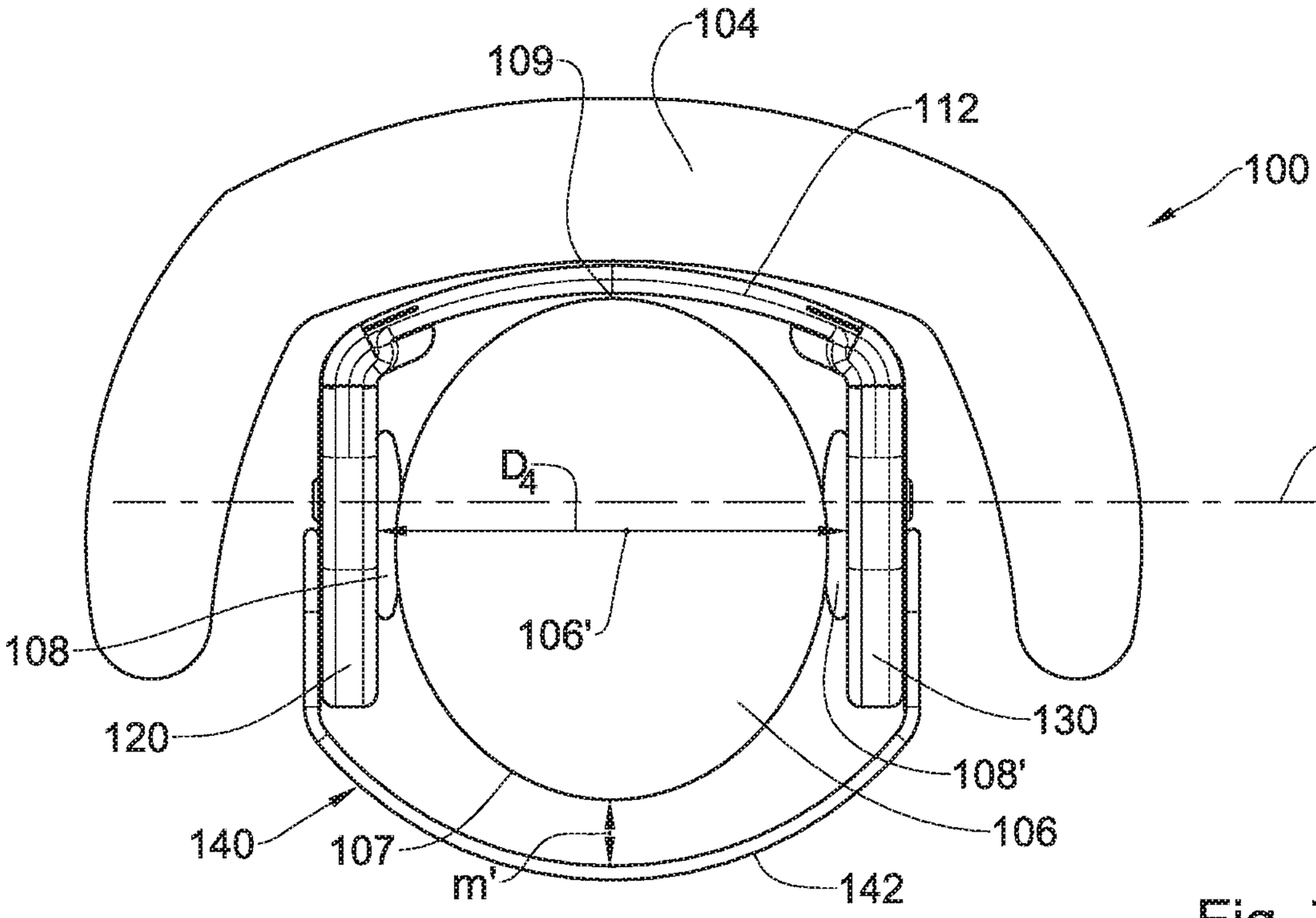

104
109
112
100
X
D_4
106'
108
120
130
108'
106
140
107
m'
142

Fig. 7B

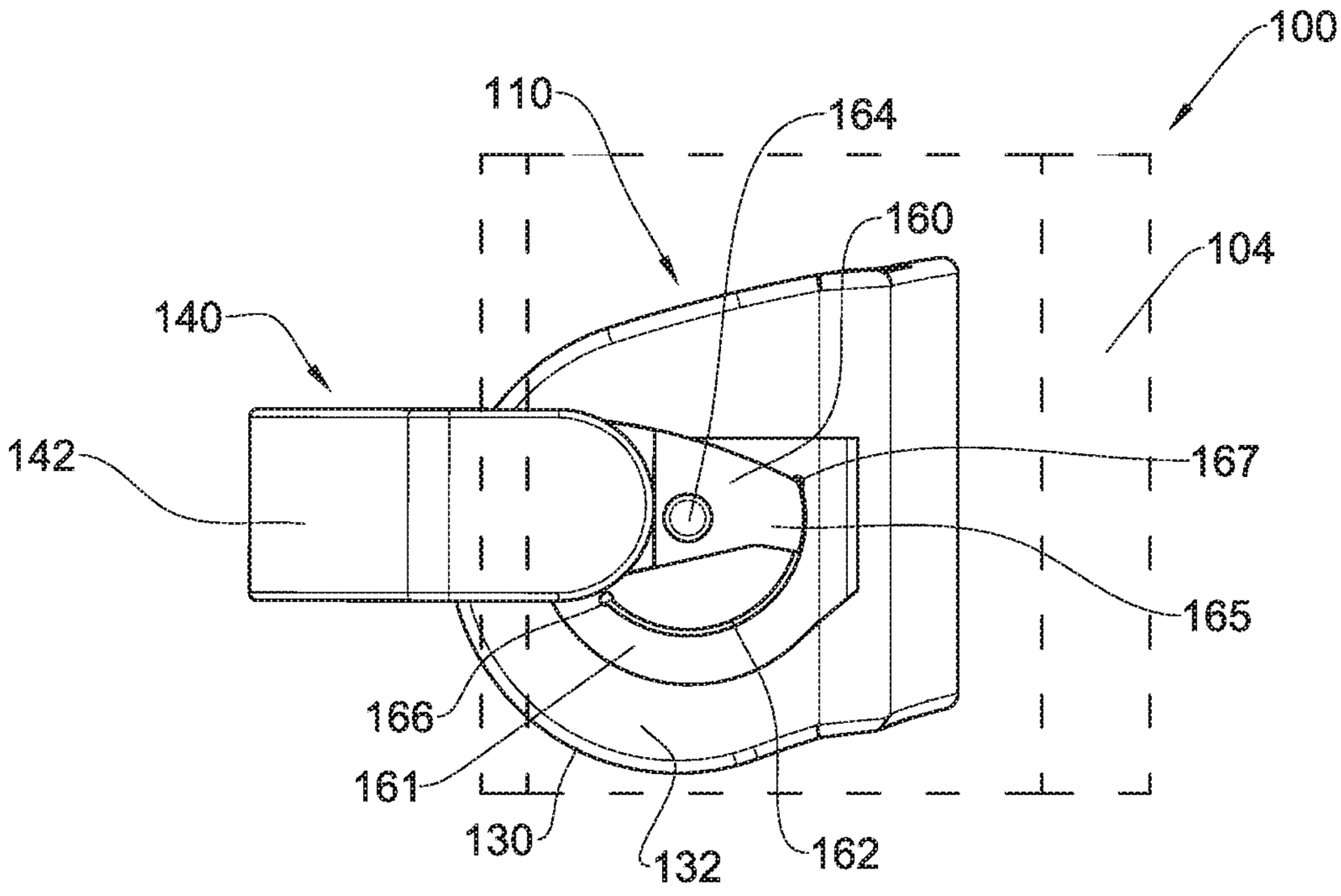

100
110
164
160
104
140
142
167
165
166
161
130
132
162

Fig. 7C

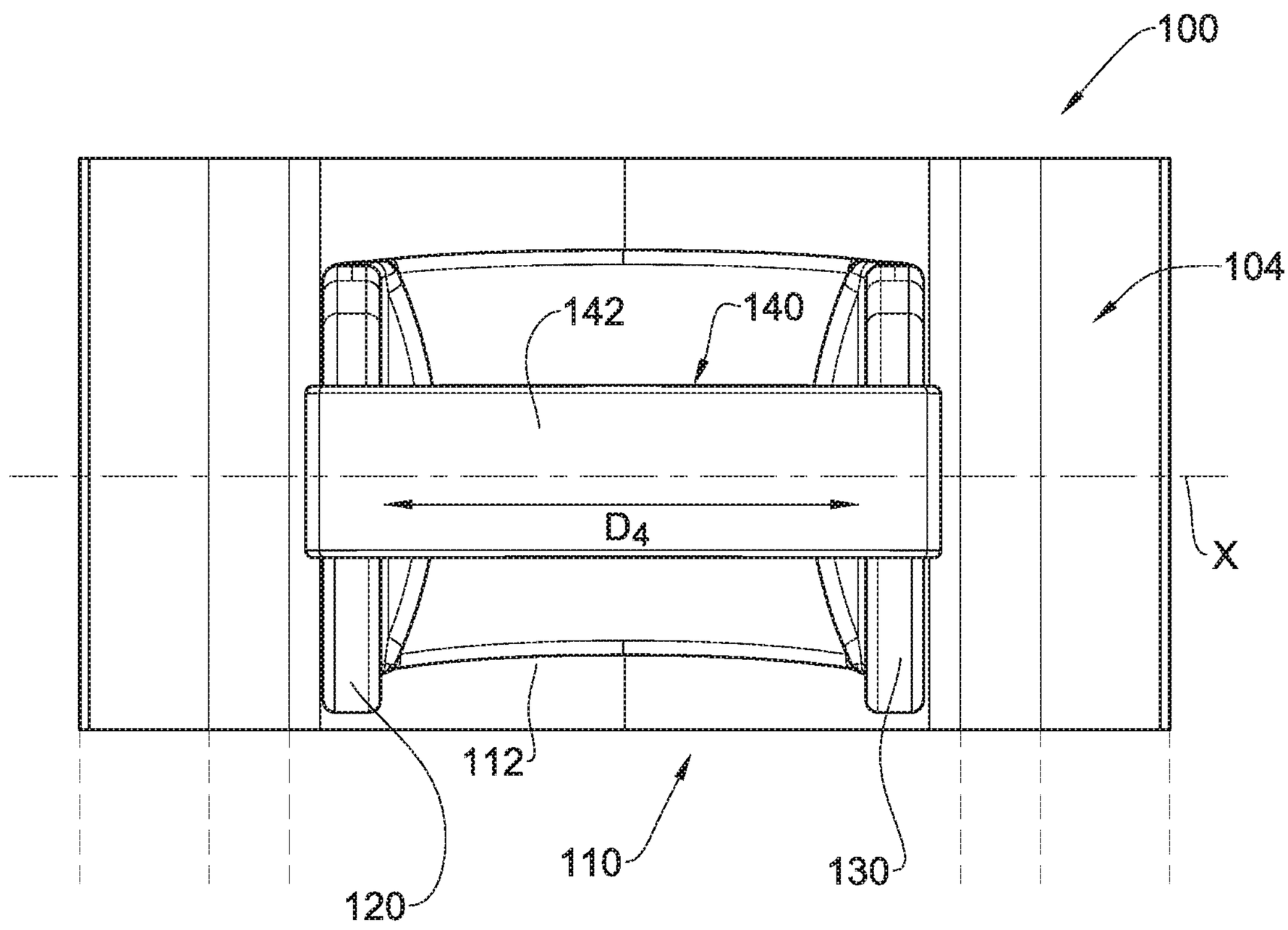

100
104
142
140
D_4
X
112
120
110
130

Fig. 7D

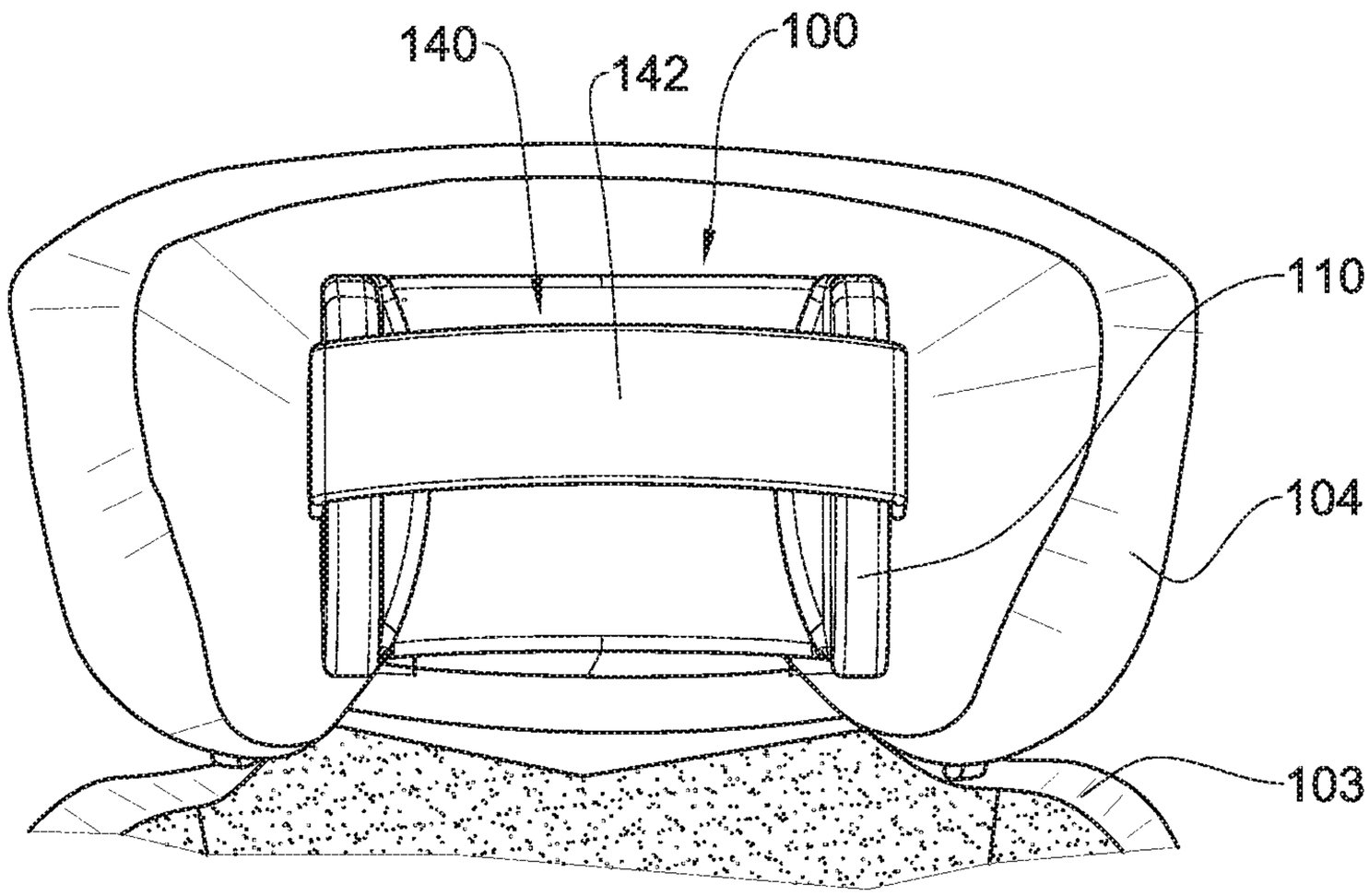


Fig. 7E

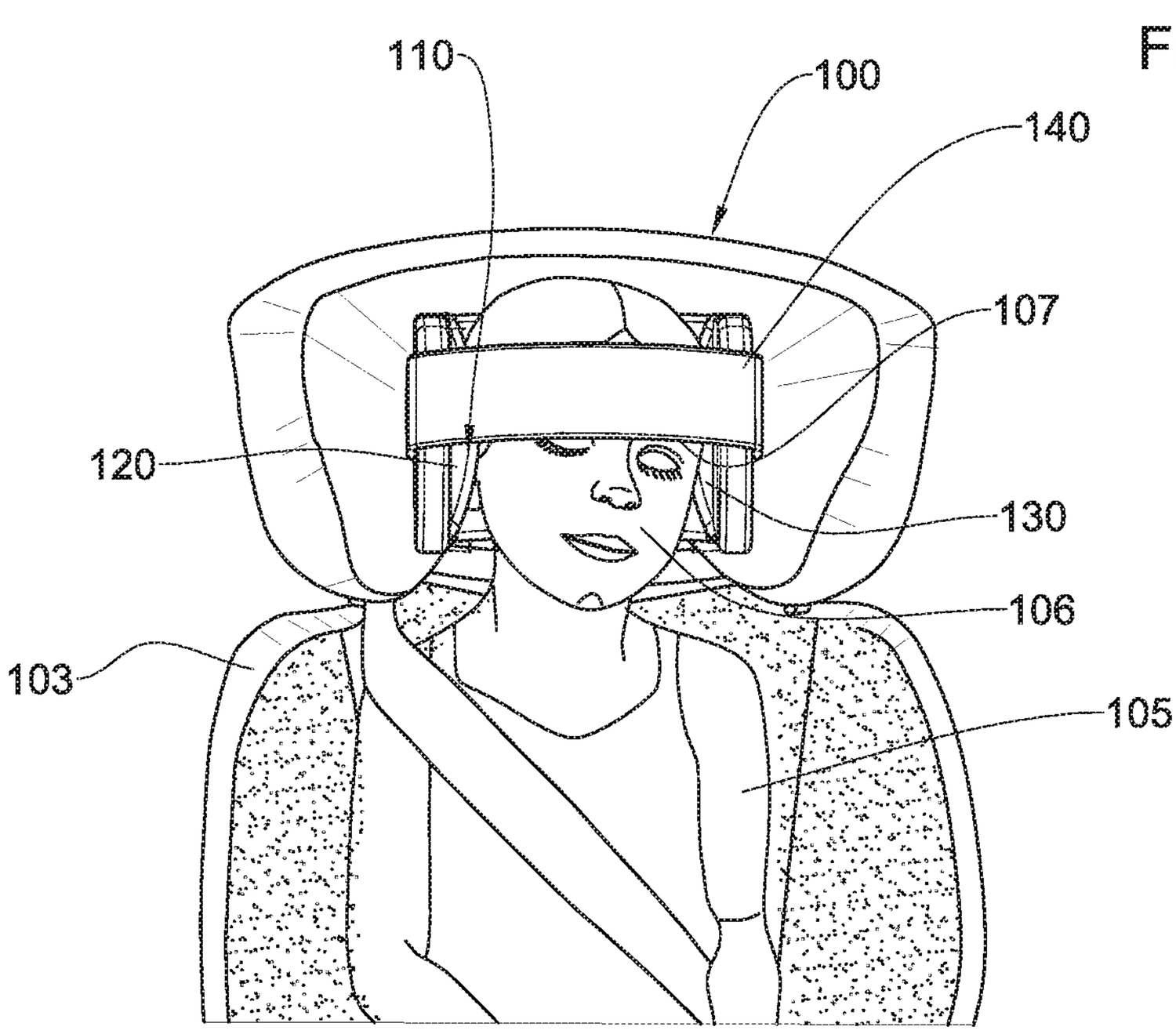


Fig. 7F

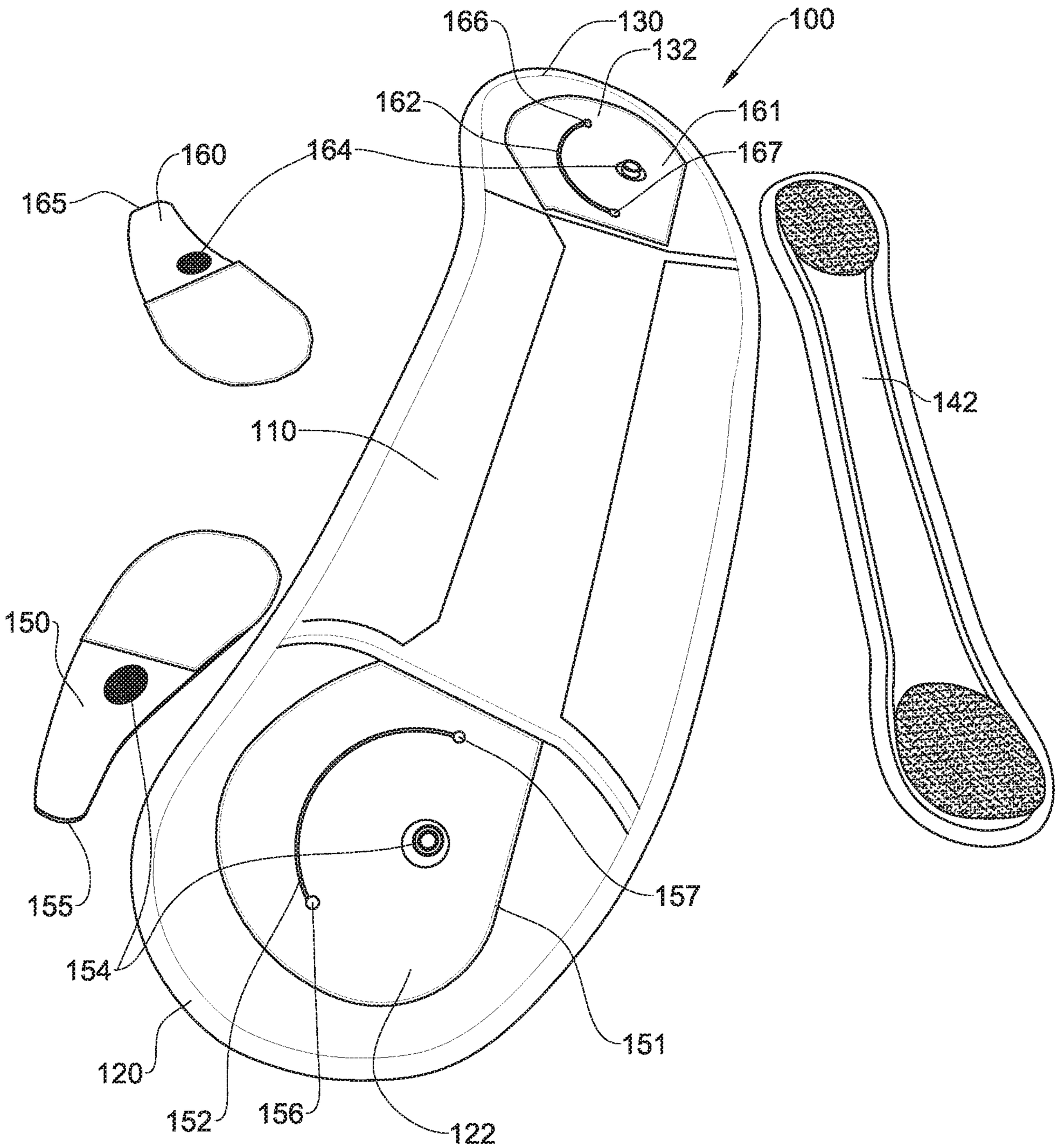

166
130
132
100
162
161
160
164
167
165
142
110
150
155
157
154
151
120
152
156
122

Fig. 8

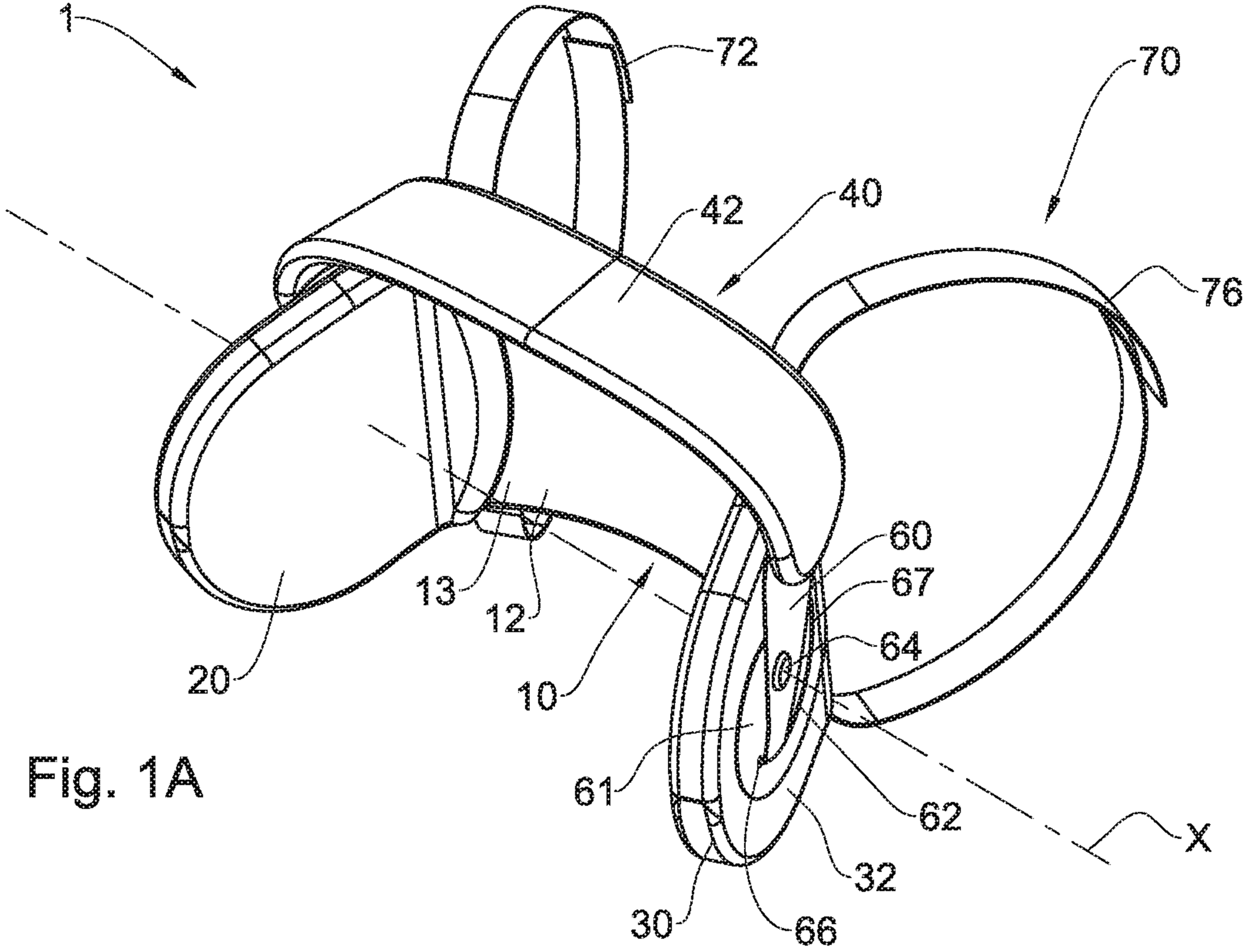


Fig. 1A