

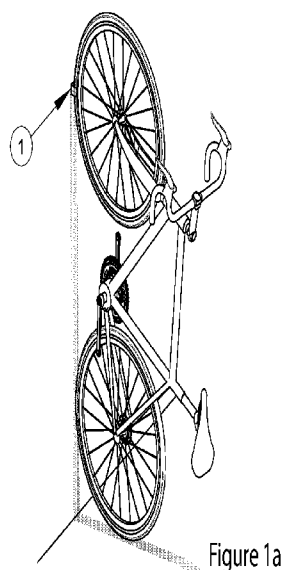


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(54) Title: EQUIPMENT ORGANIZER



(57) Abstract: Disclosed is an equipment organizer or storage device for the storage, organization or hanging of various objects in a home or commercial setting. The device comprises an outer part and an inner part engaged into the outer part. The device components may be injection molded from common plastics such as polycarbonate and may optionally be created by 3D printing. The device may be used for storage of sporting equipment, such as bicycles, but may also be easily adapted for storing other items such as musical instruments and household items such as brooms and tools. The inventive device is adapted for ease of installation and use without damage to the stored item or its environment. The inventive device has a small footprint and it functions as an inexpensive storage solution.



EQUIPMENT ORGANIZER

FIELD OF THE INVENTION

5 The present invention relates to the field of equipment organizers for the storage of various items. More specifically, this invention relates to an equipment organizer apparatus for the storage, hanging or attaching of various items in a home or commercial environment. The invention may commonly be used for the hanging or storage of various common sporting or recreational items, such as bicycles, skis or musical instruments. The inventive apparatus
10 is well adapted to any storage or attachment task where a sturdy, durable and compact solution is desired for storing the subject item while minimizing space used and providing for easy installation and maintenance.

BACKGROUND OF THE INVENTION

15 Current solutions for the storage and/or attachment of sporting goods, recreational items and other household items tend to be cumbersome, large, difficult to install and use, and they have the potential to cause damage to the walls they are attached to or the floors they rest on. They may also cause damage to the item being stored due to choice of materials in the storage devices or the manner in which the storage devices interact with the item being stored.

20 Taking the example of currently available bicycle storage racks and hooks, they tend to have all of the above drawbacks. For example, various wall-mounted frame rests are available to hang bicycles horizontally on walls. All of the known wall-mounted racks of this type operate by mounting the often heavy and large rack to a wall, usually requiring a relatively difficult and invasive installation. Either through wear and tear on the rack once installed, or simply through design limitations, these racks also have the potential to damage
25 the bicycle at the point where the rack touches the bike. These racks are most suitably configured for bicycles with flat top tubes and they can challenge users with the need to lift the entire bike off the floor to hang it.

30 Wall-mounted wheel hooks are also known for hanging bicycles. These devices typically operate by placing the hook through the wall or ceiling surface into a wall stud for a secure installation, thus requiring a more difficult and/or invasive installation. With these devices, the bicycle is typically hung by engaging the front wheel rim to the hook and allowing the bike to sit vertically with the rear wheel touching the wall. These devices create

the potential for damage to the bicycle rim and/or wheel spokes and they can be difficult for users because of the need to lift the entire weight of the bicycle in a vertical position and engage the hook between the spokes the bicycle wheel.

5 Other wall-mounted solutions are known, such as wall-leaning frame rests and floor to ceiling frame rests. These solutions may not require a complicated and invasive installation, but may still require users to lift the entire weight of one or more bicycles, which can be considerable with a mountain or hybrid type bicycle (in the range of 13-15 kg or more). Also, because the racks are not securely attached to a wall, there is the potential for them to fall over or otherwise become unstable. Finally, these racks still take up considerable space in a home
10 or commercial environment.

There are also various floor-mounted blocks for storing bicycles in their natural horizontal position. These block-type racks may not require significant installation and some may not consume significant space, but they have the potential to be unstable and to be prone to user error, thus potentially resulting in falling bicycles, causing user injury or damage to
15 the bicycle.

Ceiling mounted bicycle racks and hooks are also known. These racks likely have the most complicated and challenging installation requirements due to the need to mount them into ceiling joists for a secure installation. Also, many users will be challenged by the need to lift their bicycle above their heads to store it. Finally, the risk of user injury during the
20 storage process or resulting from an improperly installed rack is large.

Many of the known solutions have the already highlighted limitation of the potential for an incorrect installation and resulting consequences including personal injury from items falling from height. Not all users will perform a proper installation of a fully weight bearing rack or hook into a wall stud or using wall plugs. This can result in the rack or hook pulling
25 away from the wall when the weight of an item such as a bicycle is placed on the rack. Clearly, a bicycle falling from overhead could cause severe personal injury, particularly to children, and perhaps particularly when occurring from a ceiling-mounted bicycle rack.

Currently the majority of ski storage racks consist of two posts (dowel rods) that stick out nearly perpendicular to the mounting surface. The skis are then wedged between the two
30 posts and the bend of the ski is then relied upon to hold them off the ground. These dual post racks are typically made out of bent wire or wood.

Another option for storing skis is to have two posts that stick out from the wall approximately 45 degrees above vertical. These two posts are spaced several feet apart and the skis are mounted horizontally onto the two posts.

Accordingly, there is a need for a storage solution for bicycles and other items that is
5 stable and secure, simple and easy to install, space saving in terms of reducing the required footprint, able to keep the stored item from coming into contact with walls, and also a solution that is neat and tidy and prevents stored items from leaning on each other or becoming intertwined when multiple items are stored. The solution should also provide ease of use and should not require the user to lift the full weight of a bicycle or other stored item off the floor
10 to store it. Therefore, the aim of the present inventors is to provide a storage solution with the above attributes.

SUMMARY OF THE INVENTION

The current invention comprises an equipment organizer for the organization and storage of items such as sporting goods, musical instruments and other items in a home or
15 commercial environment.

Taking the example of an equipment organizer for the storage of bicycles, the inventive device comprises two main components. An outer part is attached to a wall using, for example, screws or an adhesive. An inner part snaps into the outer clip using the tension in the outer clip. Various aspects of the stored bicycle, such as the tire or a handlebar are then
20 placed into the inner part and are held in place.

Again, taking the non-limiting example of storing a bicycle with the inventive device, the bicycle may be stored perpendicular to the floor by resting the back wheel on the floor and engaging the front tire into the inner part of the inventive device. In an alternative configuration, a component of a handlebar may be engaged into the inner part of the inventive
25 device with the bicycle resting horizontally on the floor. Each of these options for storage does not require the device to be bearing the full weight of the bicycle as the majority of the bicycle's weight will be borne by the floor with the device simply preventing the bike from falling over or backwards. Each of these options for storage also does not require the user to lift the full weight of the bicycle off the floor to store the bicycle.

The inventive device can be constructed from injection-molded polycarbonate, but one
30 of skill in the art will realize that alternative constructions are possible from other types of

plastic or even other materials with the desired durability and flexibility attributes, amongst other requirements.

The inventive device can be adapted for use in storing many sporting goods and other household and commercial items. Adaptation of the device can be accomplished through varying the dimensions of the inner part and, in certain situations, by varying the dimensions of the inner part and outer part. In most applications, the inventive device will not be deployed in a situation requiring the bearing of significant weight and, thus, significant varying of materials and/or tolerances is not commonly required.

BRIEF DESCRIPTION OF FIGURES

10 The invention will be better understood according to the following detailed description of several embodiments with reference to the attached drawings, in which:

- Figures 1a and 1b shows a perspective view of a bicycle stored by engaging the inner part of the inventive device with the bicycle tire according to an embodiment of the current invention;
- 15 - Figure 2 shows a perspective view of a bicycle stored by engaging the inner part of the inventive device with the bicycle handlebar according to an embodiment of the current invention;
- Figure 3 shows a schematic representation of the outer part of the inventive device.
- Figure 4 shows a schematic representation of the inner part of the inventive device.
- 20 - Figure 5 shows a schematic representation of the outer and inner parts of the inventive device assembled together.
- Figure 6 shows a schematic representation of an embodiment of the present invention adapted for a road bicycle.
- Figure 7 shows a schematic representation of an embodiment of the present invention adapted for a hybrid bicycle.
- 25 - Figure 8 shows a schematic representation of an embodiment of the present invention adapted for a mountain bicycle.

- Figure 9 shows a schematic representation of an embodiment of the present invention adapted for a fat tire bicycle.
- Figure 10 is a schematic representation of how a single outer part of the inventive device can be fitted with multiple inner parts to accommodate specific tire sizes.
- 5 - Figure 11 is a schematic representation of how a single outer part of the inventive device can be fitted with multiple inner parts to accommodate a range of tire sizes.
- Figures 12a and 12b demonstrate schematically how the inventive device can be mounted at an angle, either alone or in pairs.
- Figure 13 provides a schematic representation of how a strap can be used with the
10 inventive device for added security.
- Figure 14 provides a schematic representation of how the design of the inventive device can be modified for 3D printing.
- Figure 15 demonstrates how the inventive device can be adapted to store a guitar according to an embodiment of the present invention.
- 15 - Figure 16 demonstrates how the inventive device can be adapted to store a skateboard according to an embodiment of the present invention.
- Figure 17a and 17b demonstrates how the inventive device can be adapted to store skis according to an embodiment of the present invention.

20 **DETAILED DESCRIPTION OF THE INVENTION**

The current invention comprises an equipment organizer for the organization and storage of items such as sporting goods, musical instruments and other items in a home or commercial environment.

25 Taking the example of an equipment organizer for the storage of bicycles, the inventive device comprises two main components. An outer part is attached to a wall using screws or other fasteners or an adhesive. An inner part snaps into the outer clip using the tension in the outer clip. Various aspects of the stored bicycle, such as the wheel rim or a handlebar are then placed into the inner part and are held in place.

Again, taking the non-limiting example of storing a bicycle with the inventive device, the bicycle may be stored perpendicular to the floor by resting the back wheel on the floor and engaging the front wheel rim into the inner part of the inventive device. In an alternative configuration, a component of a handlebar may be engaged into the inner part of the inventive device with the bicycle resting horizontally on the floor. Each of these options for storage does not require the device to be bearing the full weight of the bicycle as the majority of the bicycle's weight will be borne by the floor with the device simply preventing the bike from falling over or backwards.

The inventive device can be constructed from injection-molded polycarbonate, but one of skill in the art will realize that alternative constructions are possible from other types of plastic or even other materials with the desired durability and flexibility attributes, amongst other requirements. Solely by way of example, the outer part may be constructed of wood, carbon fiber or metal. The inner part may be constructed of rubber, or may be two-shot injection molded to accommodate the storage of sensitive items.

While the inventive device may commonly be constructed from plastic such as polycarbonate using injection molding, it may also be constructed by non-traditional methods, such as 3D printing. The use of 3D printing may require modification of the design of the inventive device so that the layers of plastic constructed during the 3D printing process build properly and so as to maintain structural integrity, as shown in Figure 14.

Turning now to the appending figures, and with specific reference to Figures 3 through 5, the storage device 1 is comprised of an inner part 2 and an outer part 3. When the storage device 1 is assembled, the inner part 2 is snapped into, or otherwise engaged to, the outer part 3. The inner part 2 is retained in the outer part 3 by virtue of the corresponding dimensions of the inner part 2 and the outer part 3 and may also be retained by friction. No adhesive or other fixing mechanism or modality is required.

The outer part 3 has a portion 4 that may be configured to sit flush against the surface that the storage device 1 is mounted to. The outer part 3 also has two arm portions 5, 6, that may sit perpendicular or at an angle away from perpendicular to the flush portion 4. The use of concave angles on the two arm portions 5, 6 allows for inward pressure, which facilitates the inner part 2 and outer part 3 fitting together and also facilitates the consistent holding of the item to be stored.

The inner part 2 may have a curved geometry throughout its cross-section which provides the part with better strength and retention capabilities and also allows for easier insertion of a stored item such as a bicycle tire. The inner part 2 also may have a highly polished surface which provides for a clinging interface which may be advantageous when
5 retaining an item such as a bicycle tire.

Turning now to Figures 6 through 9, the storage device may be configured with different sizes and geometries to the inner part 2 and outer part 3 to accommodate different sized and shaped objects. For example, in the case of bicycle tires, Figures 6 through 9 show different geometries for accommodating road, hybrid, mountain and fat tire bikes. In each
10 case, the height and width of the inner part 2 and outer part 3 vary, along with the curvature of the inner surface of the inner part 2 and the angle of the opening through which the bicycle tire or other item to be retained would pass.

With further reference to Figures 6 through 9, the angle of the opening through which the retained item would pass is, for example, smaller for a road bicycle tire than it is for a
15 mountain bicycle tire. In addition, the curvature of the inner part 2 varies depending on the bicycle tire to be retained and may be more flat for a road bicycle tire with no knobs than for a mountain bicycle tire with knobs.

Two openings may be provided in the flush part 4 of the outer part 3 for mounting the outer part 3 to a surface, which may be a wall or other supporting structure. The mounting
20 may be accomplished with screws or other fastening devices. In the alternative, the storage device may also be attached to a mounting surface with an adhesive modality. In either case, the storage device should be securely attached to the mounting surface but does not need to be mounted in a manner whereby the storage device could bear the full weight of a heavy object such as a bicycle. The storage device is designed to be mounted such that the weight of the a
25 bicycle is borne by the floor or similar weight bearing object (e.g. a table).

While the functionality of holding a bicycle by its tire requires the weight of the bicycle to be borne by the floor, other objects that may be held by the inventive device without the weight of the object being borne by the floor or alternative weight bearing object. For example, a hockey stick may be pressed into the opening and the friction of the two arms
30 pressing inwards upon the hockey stick provides enough friction to overcome the pull of gravity on the object. This same modality of support can be applied to countless other objects.

With reference now to Figures 10 and 11, the storage device may be constructed with a uniform outer part 3 matched with inner parts 2 of multiple geometries and curvatures to accommodate different-sized objects. In this way, the inner parts 2 may be designed to accommodate specific-sized objects (Figure 10) or they may be designed to accommodate
5 objects of a range of sizes (Figure 11).

With reference now to Figures 12a and 12b, one or more of the inventive storage devices may be mounted on a mounting surface at an angle, or the opening through which the stored item would pass may be configured at an angle. In these different embodiments of the invention, the storage device may function to save space even more so than provided by its
10 general compact configuration and design.

With reference now to Figure 13, the storage device may be configured with a strap 7 that is optionally affixed by conventional means to the outer surface of the arm portions 4, 5 of the outer part 3. In this embodiment, the user would insert the item to be retained and then guide the strap around the retained object and removably affix it to both arm portions 4, 5 of
15 the outer part 3. While the use of the strap 7 in this embodiment adds security to the overall retention profile of the storage device 1, it is not necessary in most, if not all, applications. In general, the storage device 1 is designed to retain the stored object through the geometry of the inner part 2 and the outer part 3 and additionally friction between the inner part 2 and the retained object.

The storage device 1 can be adapted for use in storing many sporting goods and other household and commercial items. Solely by way of example, and not by way of limitation, the storage device could hold numerous items including guitars, brooms, towels, skis, paddles, hockey sticks, baseballs and hockey pucks. Adaptation of the device can be accomplished through varying the dimensions of the inner part and, in certain situations, by
25 varying the dimensions of the inner part and outer part. In most applications, the inventive device will not be deployed in a situation requiring the bearing of significant weight and, thus, significant varying of materials and/or tolerances is not commonly required. However, one of skill in the art will readily realize that modifications to materials and tolerances may be required to accommodate different items. These modifications will be within the skill set of
30 one of skill in the art.

The storage device 1 can also be used in a configuration of multiple units arranged side by side or in a pre-determined configuration so as to hold multiple items or multiple

regions of the same item. For example, multiple units of the inventive storage device 1 could be installed on a mounting surface next to each other and could be configured to hold hockey sticks in the dressing room of a hockey rink. In another example, multiple units of the inventive storage device could be installed in a pre-determined geometry to engage, for example, the rear wheel and front wheel of a bicycle that is positioned horizontally on the ground. While such an arrangement would not be necessary to safely retain the bicycle if the ground is supporting its weight, it may nevertheless be desirable for certain users, for example in a high traffic area where the bicycle may be constantly jostled.

10 While this invention has been shown and described with reference to particular embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

15

CLAIMS

1. .A storage device for securing items comprising:
 - an outer part configured to be attached to a bearing structure comprising a
5 portion configured to sit flush with the bearing structure and at least two portions
configured to sit at approximately right angles to the flush portion; and
 - an inner part constructed with dimensions corresponding to the dimensions of
the outer part such that the inner part can be engaged into the outer part;
 - wherein the inner part has dimensions corresponding to a portion of the item to
10 be secured such that the item to be secured may be engaged into the inner part and
thereby held in place.
2. The storage device of claim 1, wherein the outer part is configured to be attached to
the bearing structure by screws.
3. The storage device of claim 1, wherein the outer part is configured to be attached to
15 the bearing structure by an adhesive mechanism.
4. The storage device of claim 1, wherein the bearing structure is a wall.
5. The storage device of claim 1, wherein the inner part can be engaged into the outer
part and held in place solely by friction and corresponding dimensions.
6. The storage device of claim 1, wherein the item to be secured can be engaged into the
20 inner part and held in place solely by friction and corresponding dimensions.
7. The storage device of claim 1, wherein the item to be secured may additionally be held
in place by a retaining structure optionally attached to both of the at least two right angle
portions of the outer part and optionally positioned around the engaged portion of the item to
be secured.
- 25 8. The storage device of claim 1, wherein the outer or inner part, or both, is constructed
from plastic.
9. The storage device of claim 8, wherein the plastic is polycarbonate.
10. The storage device of claim 8, wherein the outer and inner part are constructed of
plastic made by injection molding.
- 30 11. The storage device of claim 8, wherein the outer and inner part are constructed of
plastic made by 3D printing.
12. The storage device of claim 1, wherein the storage device is not configured to bear the
full weight of the item to be secured.

13. The storage device of claim 1, wherein the storage device is configured to store a bicycle.

14. The storage device of claim 12, wherein the storage device is configured to store a bicycle.

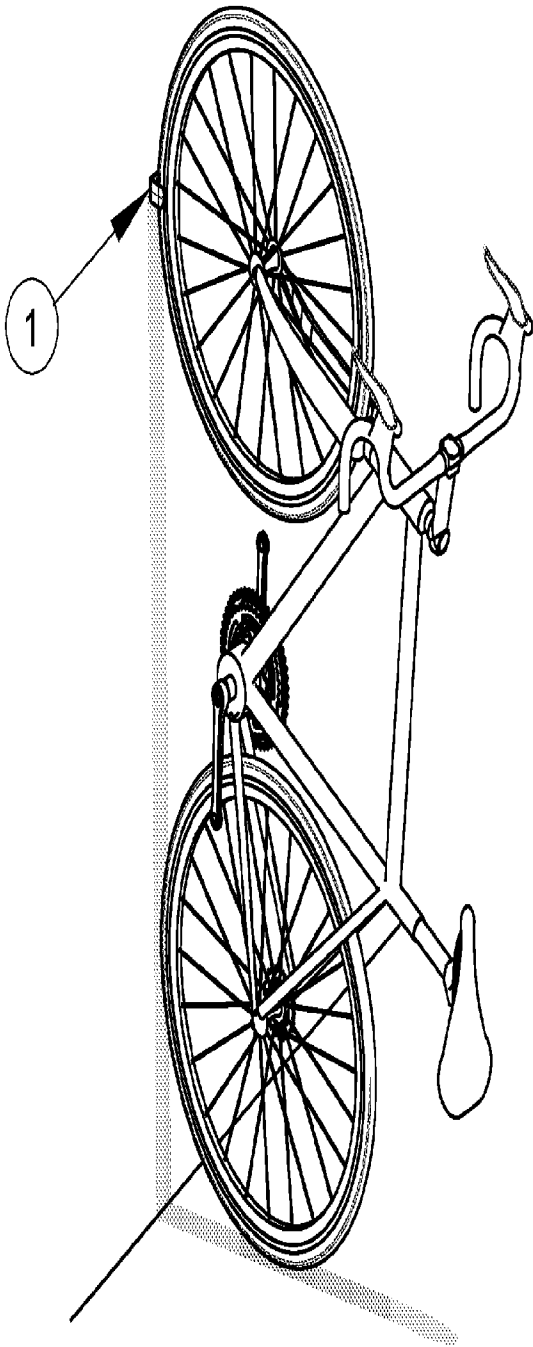


Figure 1a

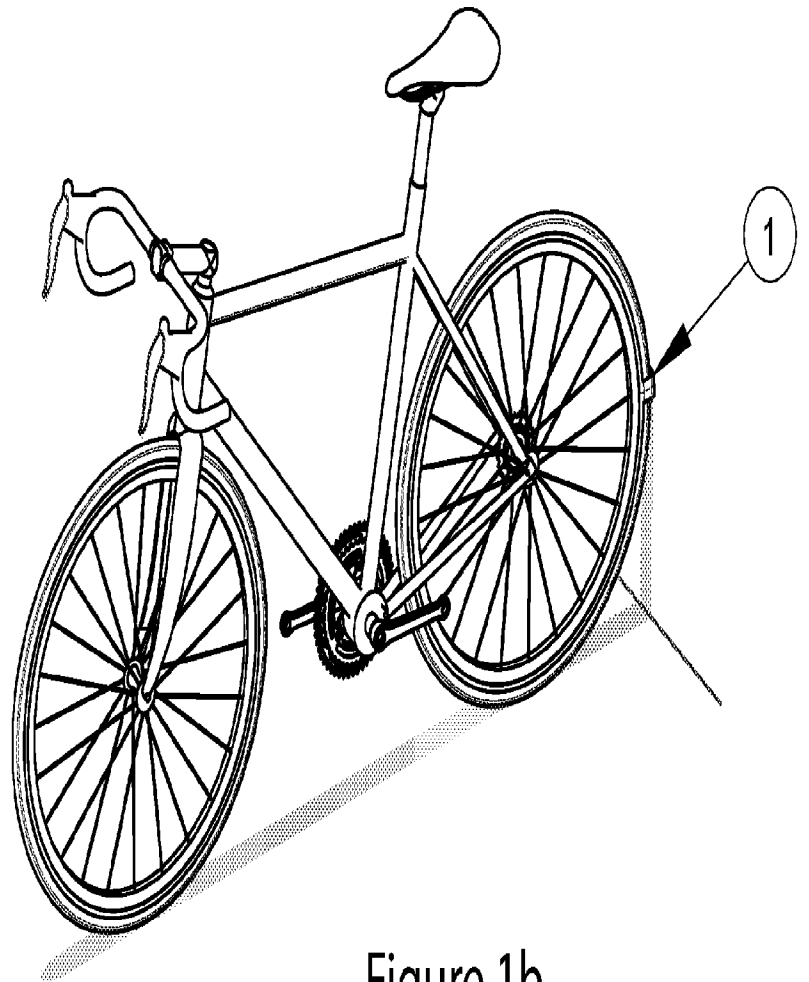


Figure 1b

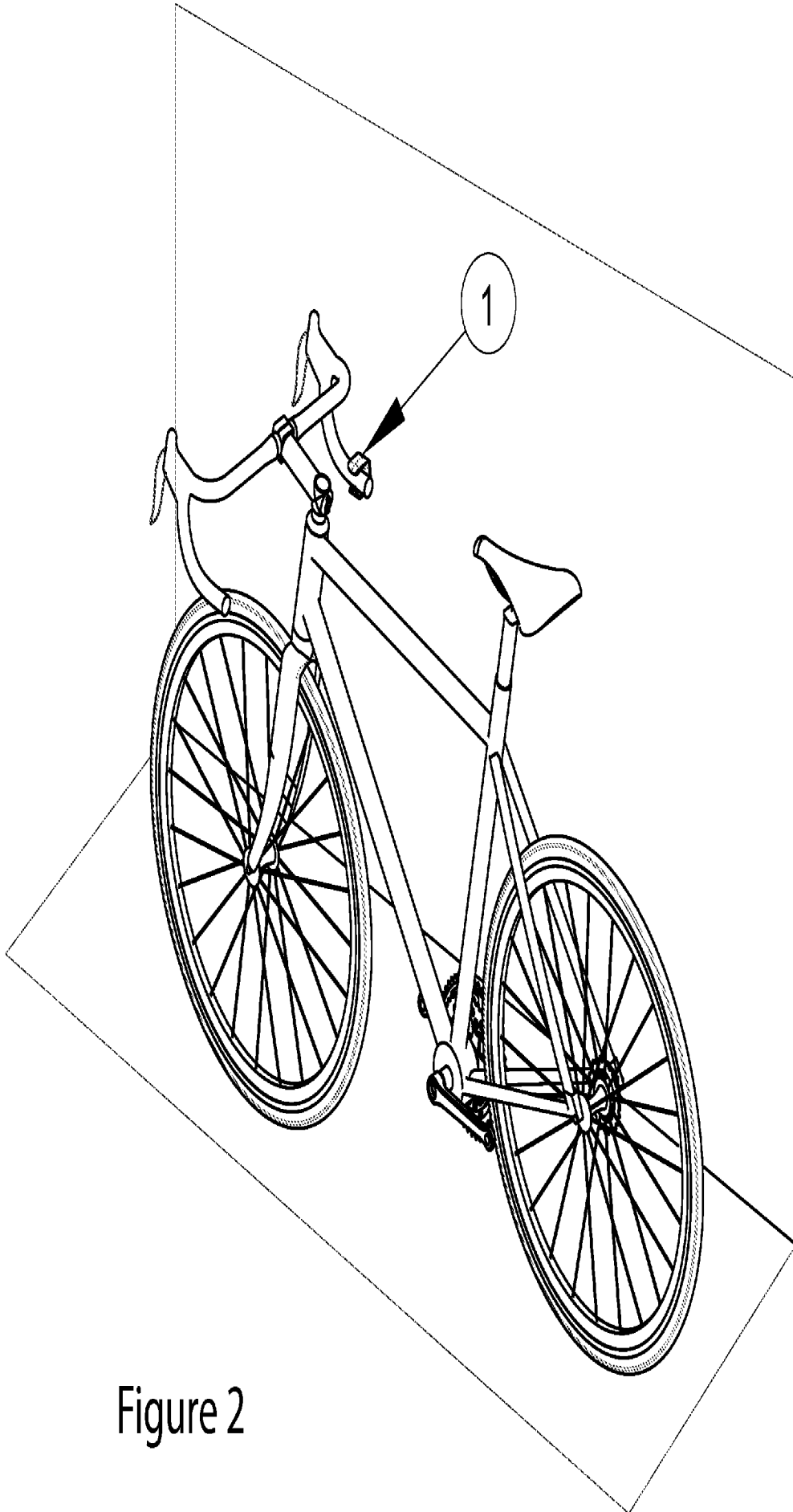


Figure 2

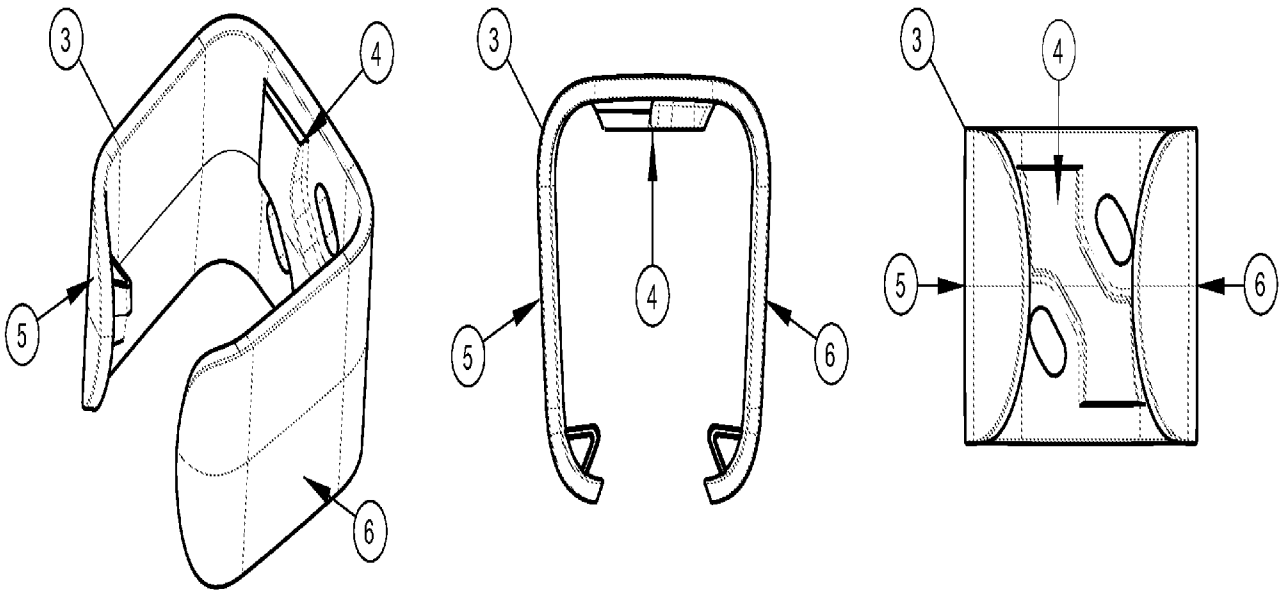


Figure 3

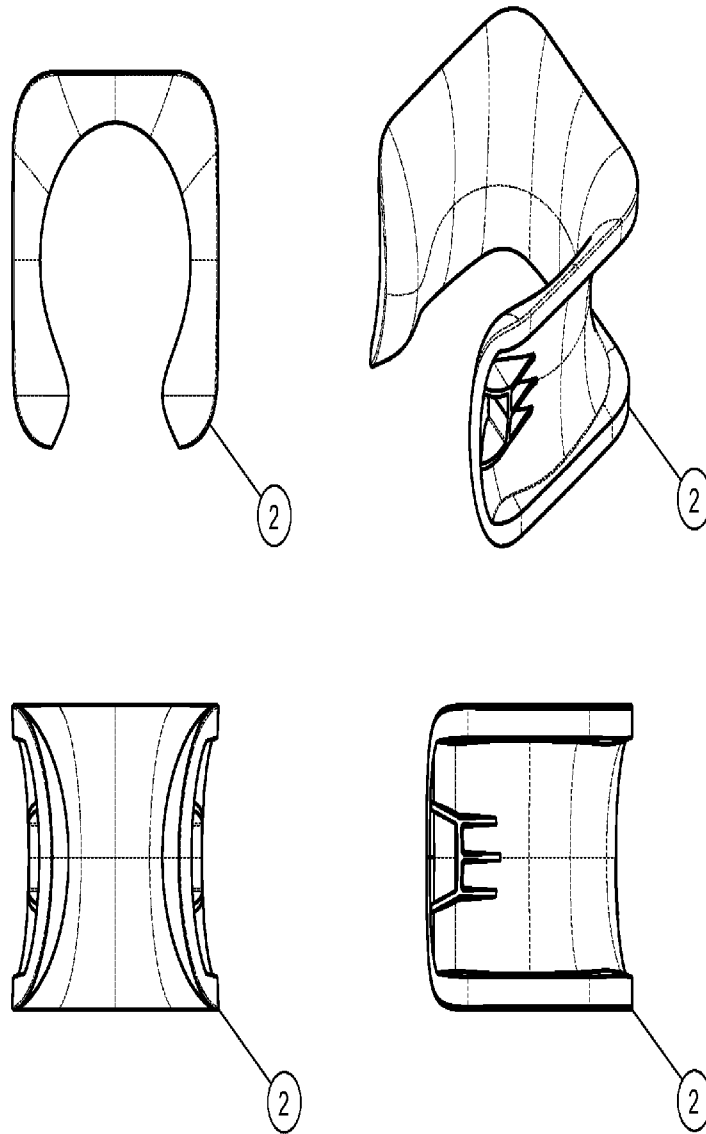


Figure 4

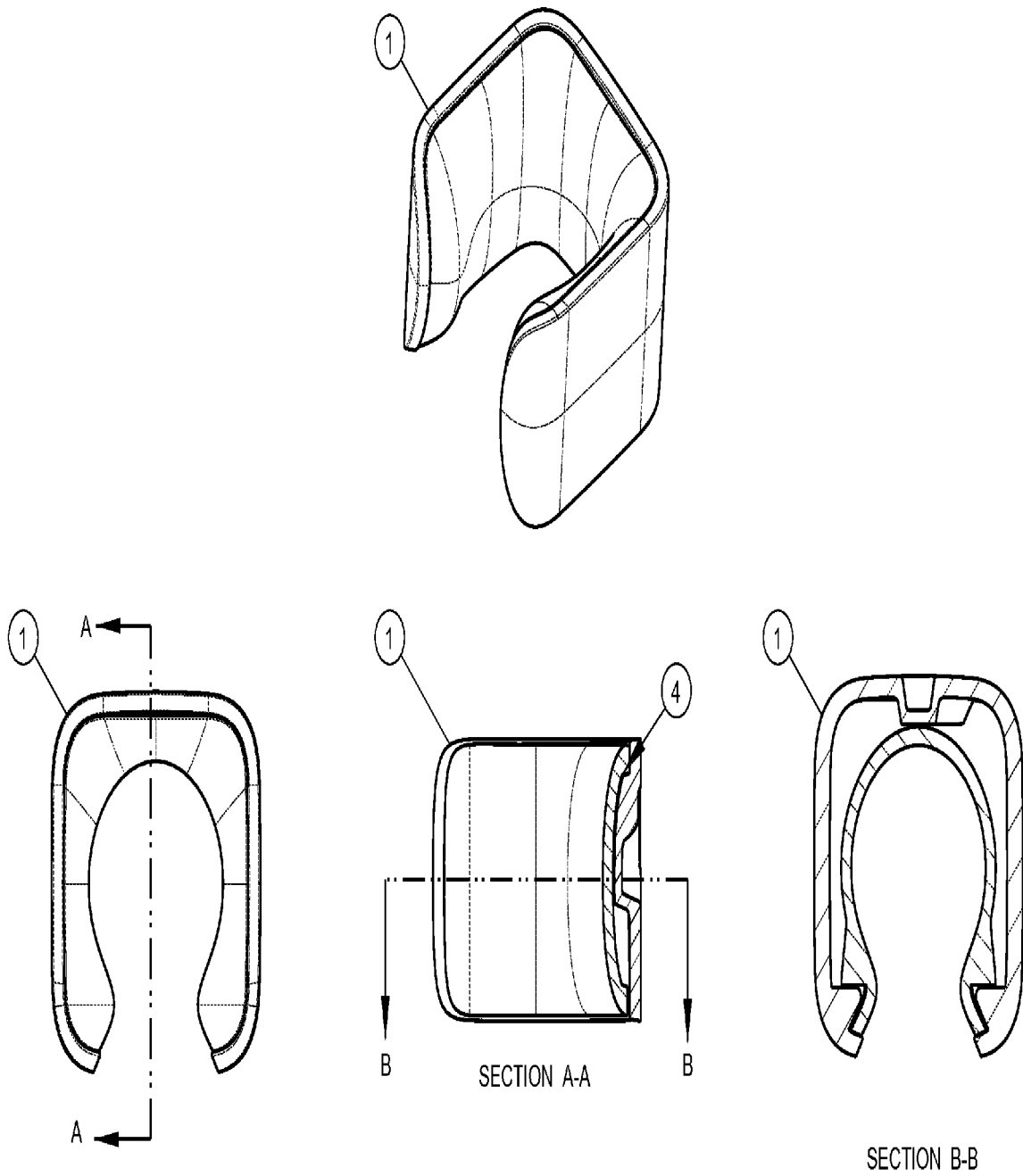


Figure 5

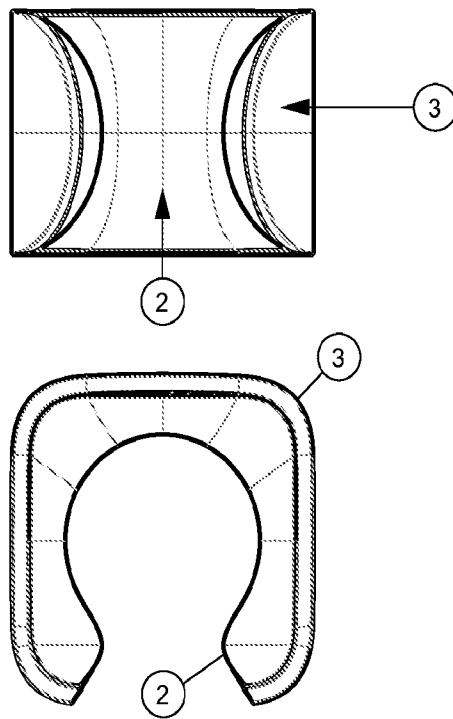


Figure 6

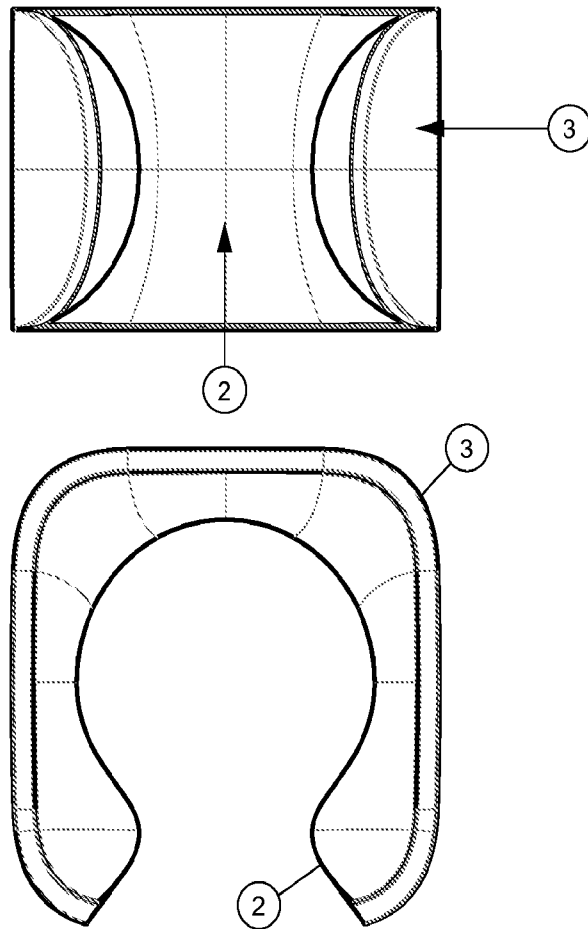


Figure 7

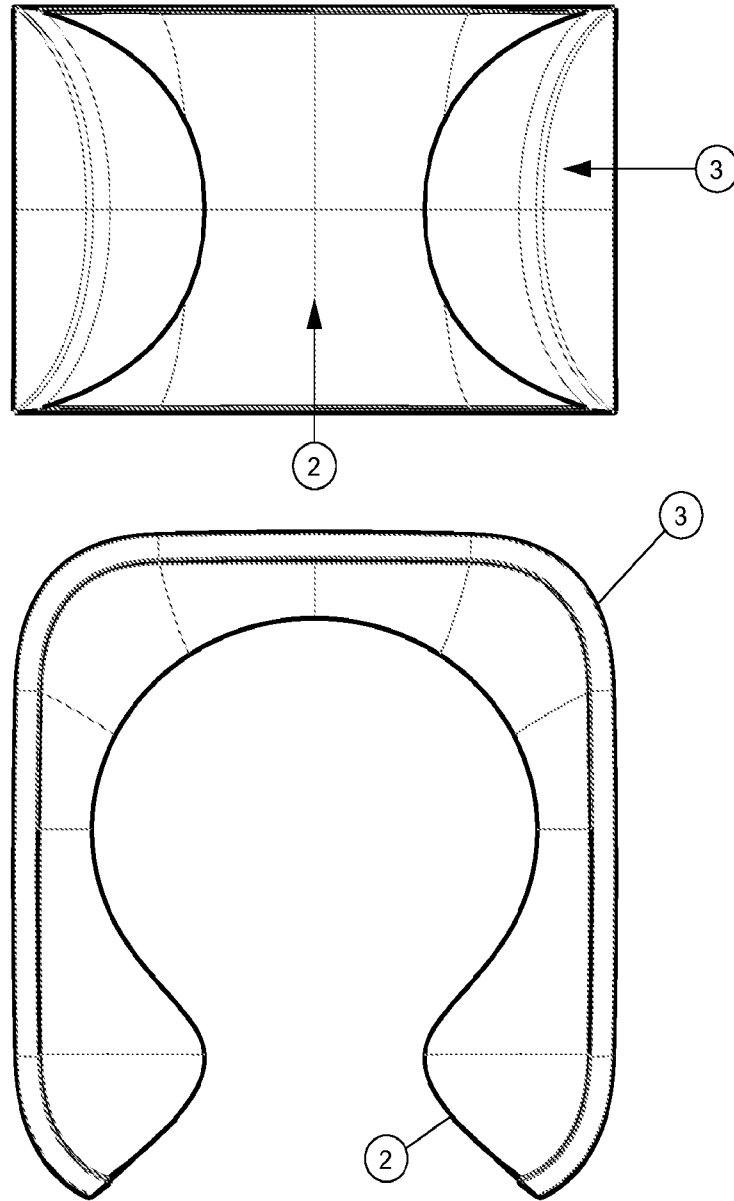
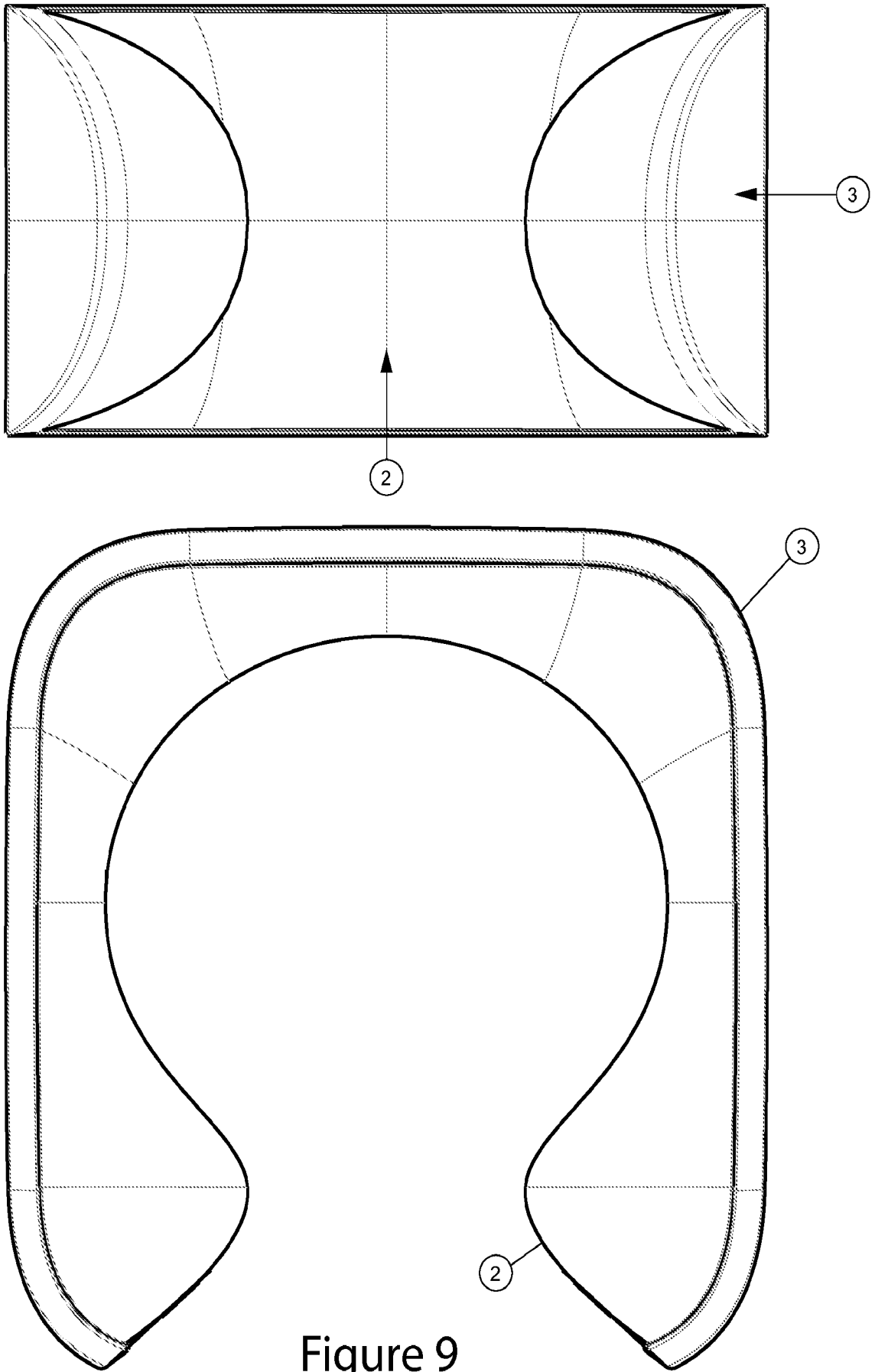


Figure 8



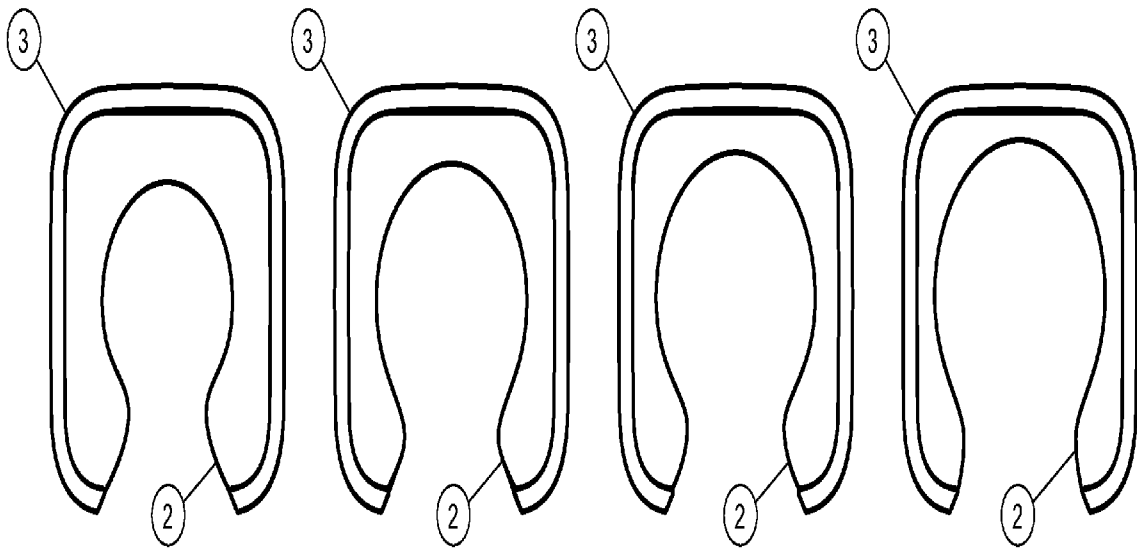


Figure 10

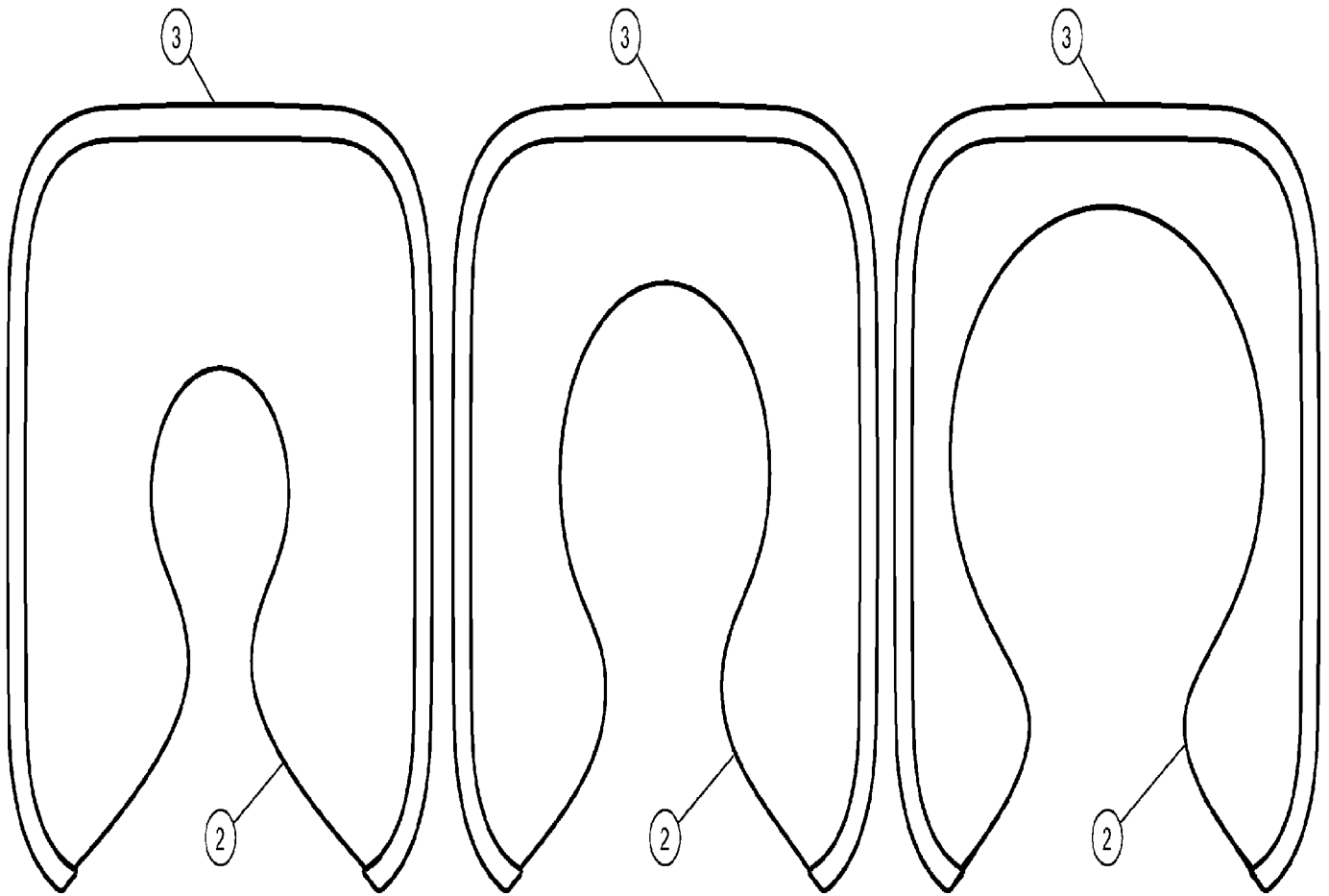


Figure 11

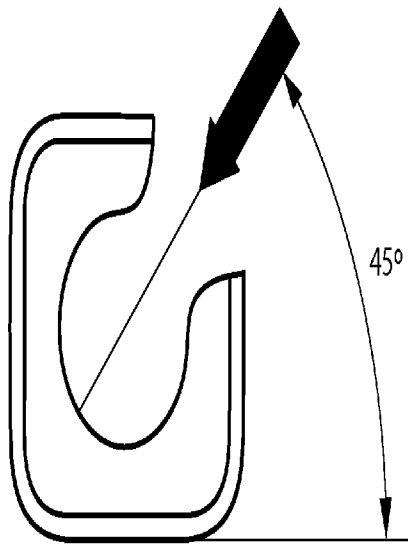


Figure 12a

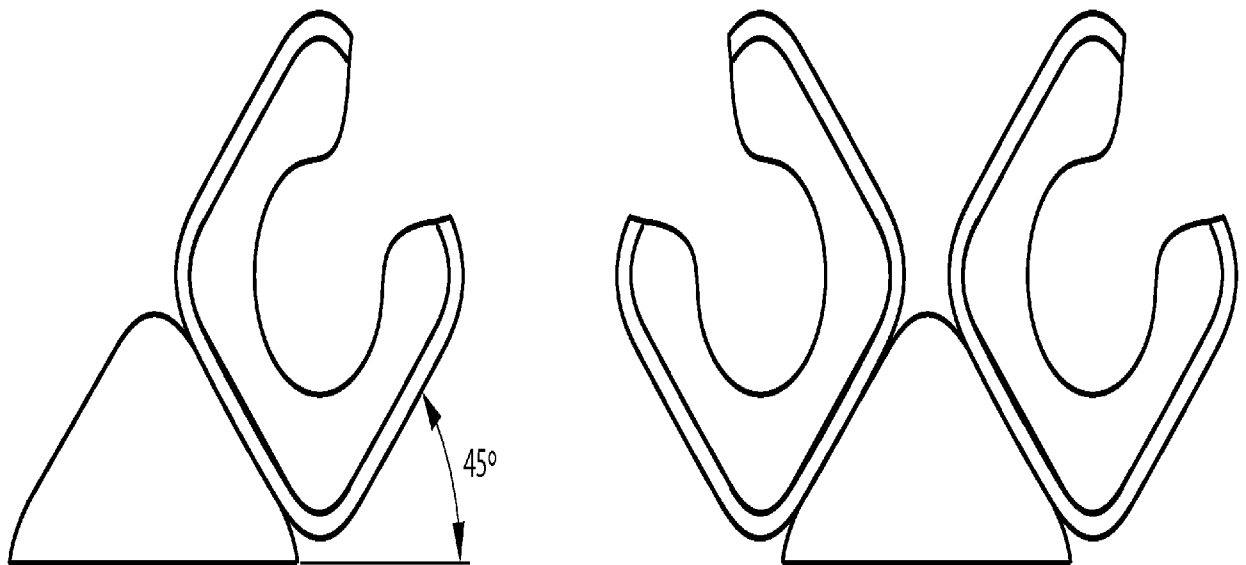
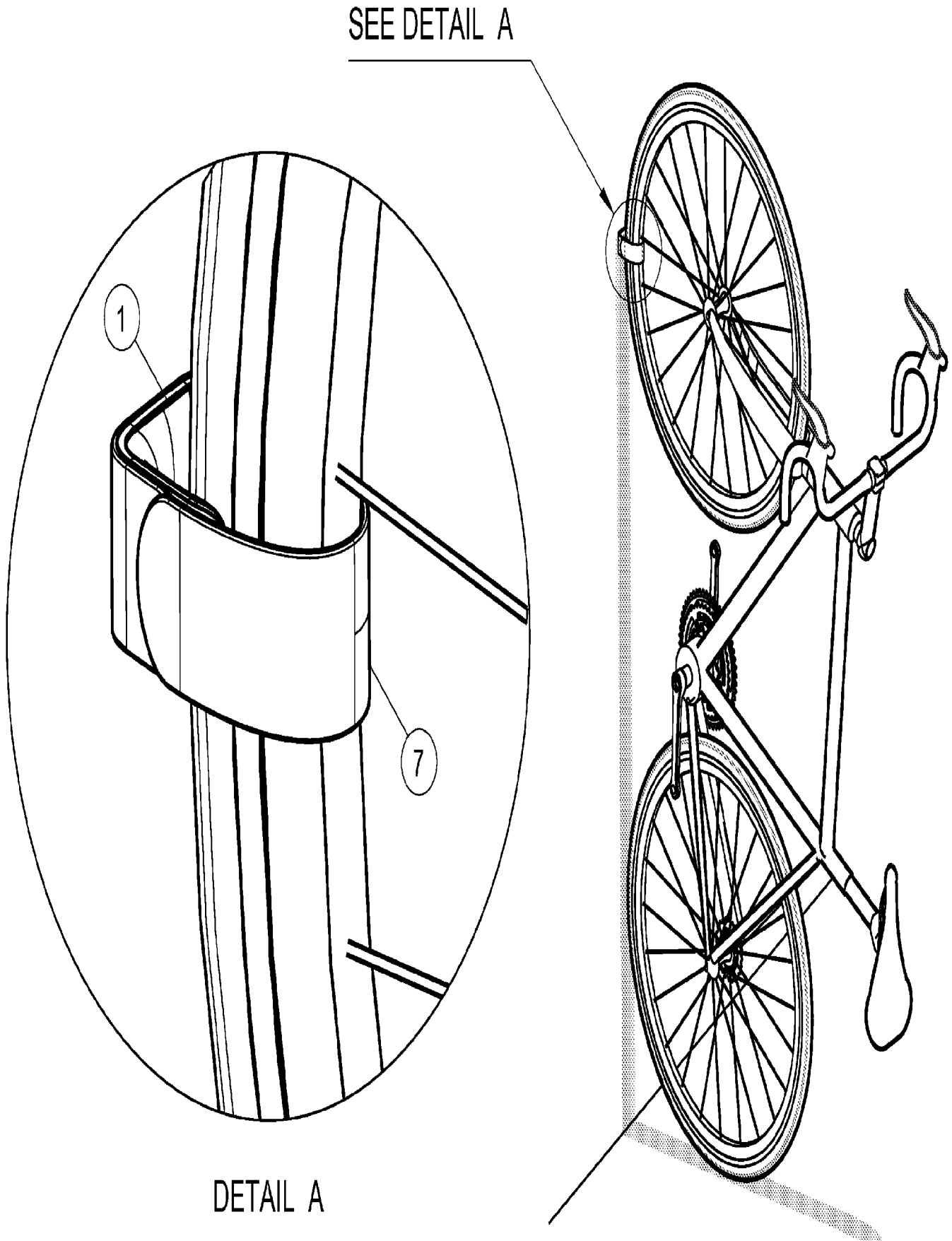


Figure 12b

Figure 13



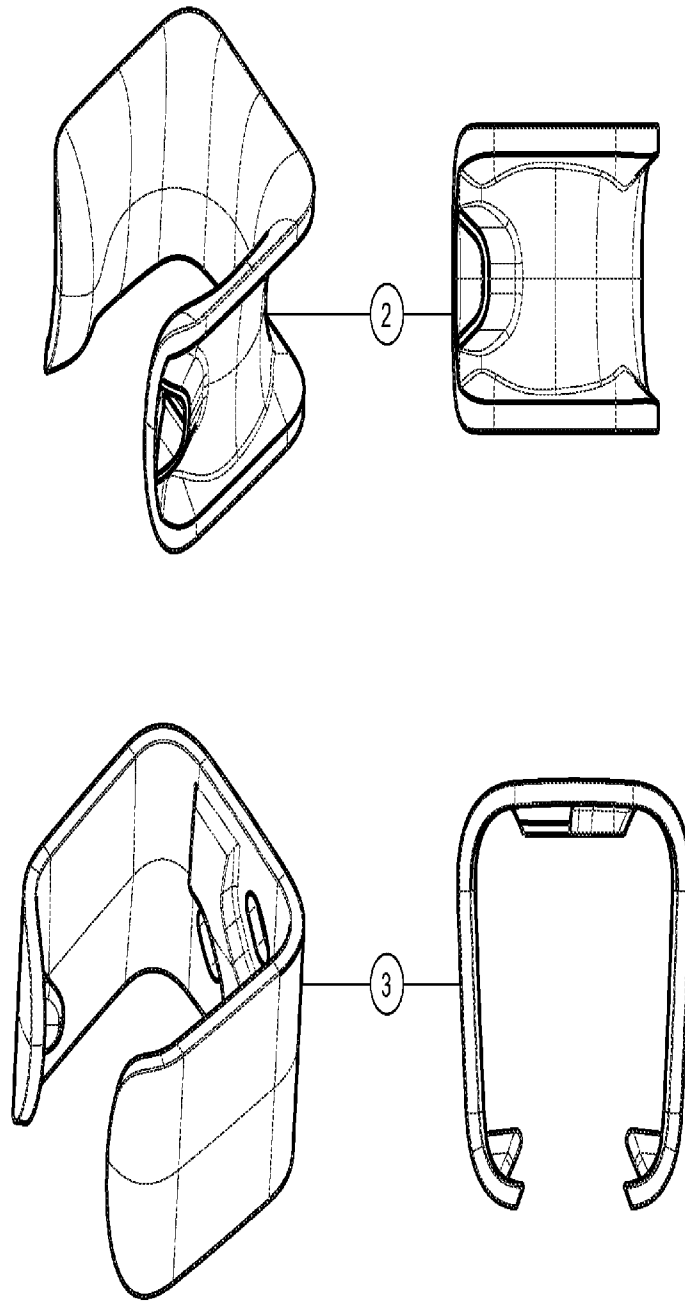


Figure 14

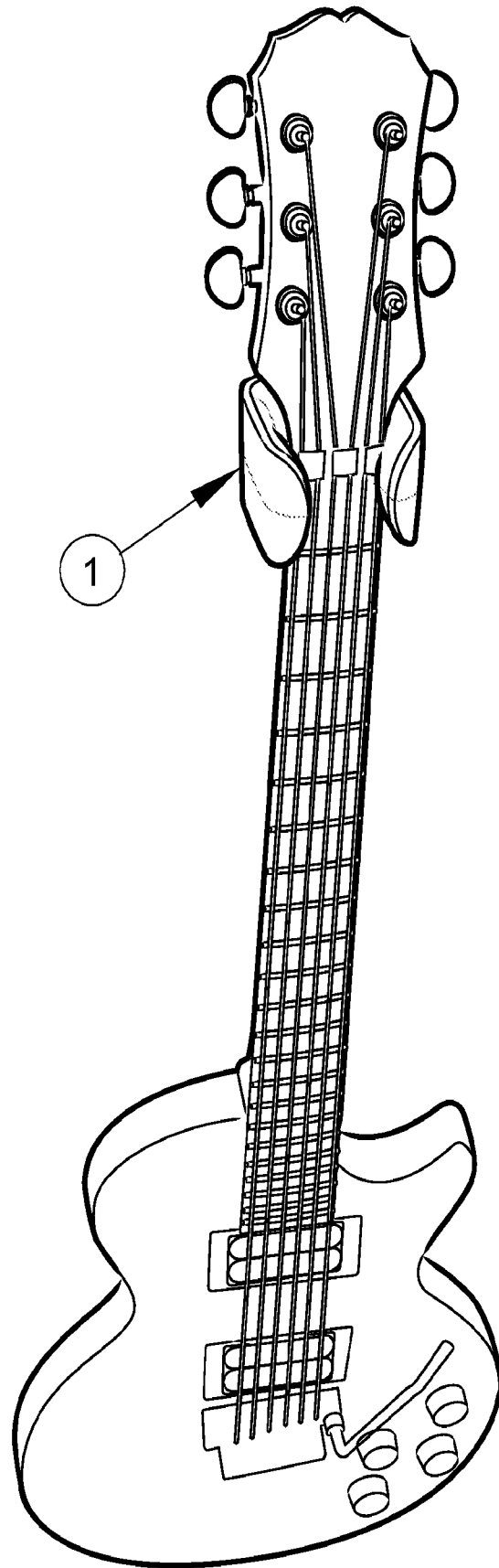


Figure 15

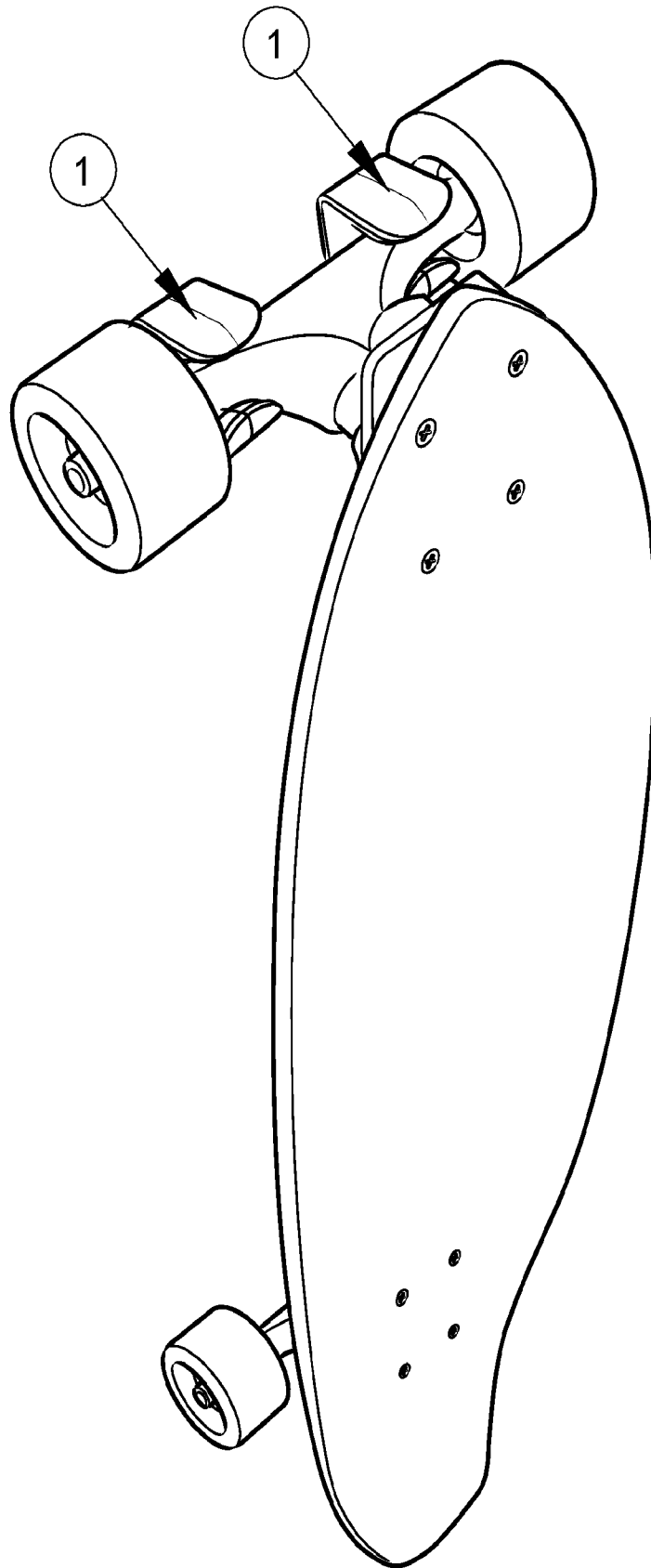


Figure 16

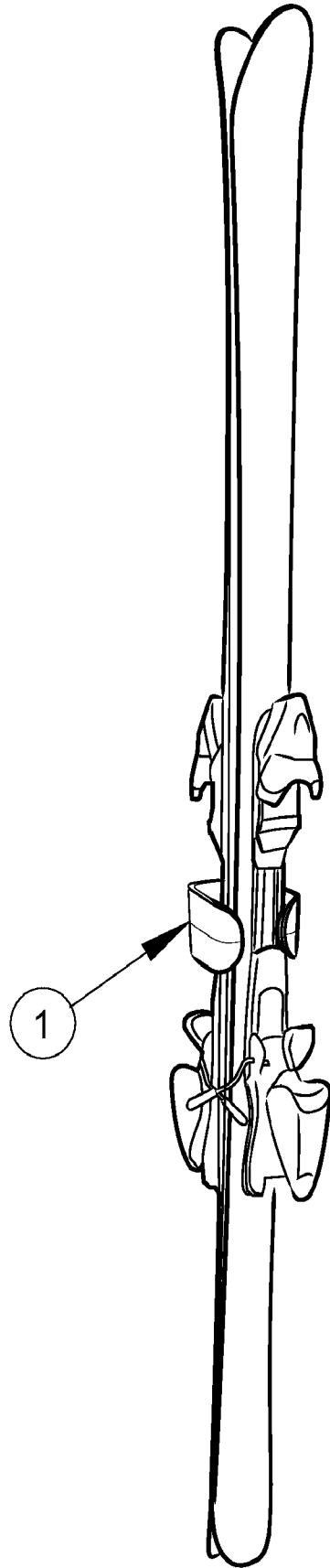


Figure 17a

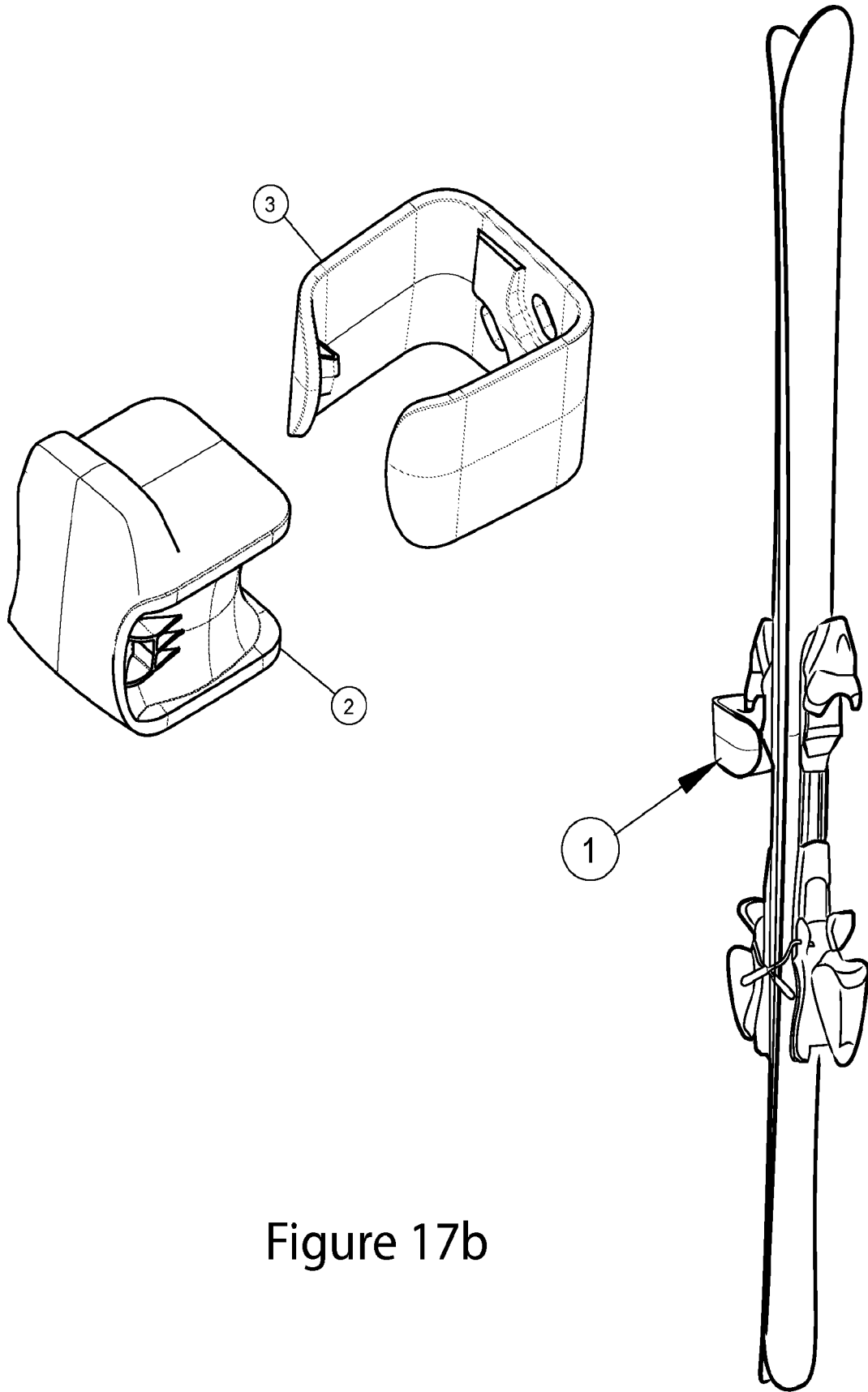


Figure 17b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/026049

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B62H 3/12 (2015.01) CPC - B62H 3/12 (2015.05) According to International Patent Classification (IPC) or to both national classification and IPC</p>																													
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC(8) - A47F 5/08; B62H 3/02, 3/04, 3/12 (2015.01) CPC - A47F 5/08; B62H 3/02, 3/04, 3/12 (2015.05) (keyword delimited)</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC - 211/2, 18, 19, 64, 70.5, 70.6, 70.8, 87.01, 89.01; 248/113, 205.3, 316.7</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase, Google Patent, Google search terms used: wall, vertical, grip, clip, clamp, bicycle, bike, wheel, u shape, c shape, clug, mount, rack</p>																													
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 3,809,799 A (TAYLOR) 07 May 1974 (07.05.1974) entire document</td> <td>1-5, 8, 12</td> </tr> <tr> <td>X</td> <td>JP 50-105149 U (SANPO DENKI) 29 August 1975 (29.08.1975) see machine translation</td> <td>1, 6, 12-14</td> </tr> <tr> <td>Y</td> <td></td> <td>7</td> </tr> <tr> <td>X</td> <td>US 4,932,625 A (HOTCHKISS, JR.) 12 June 1990 (12.06.1990) entire document</td> <td>1, 8-11</td> </tr> <tr> <td>Y</td> <td>US 5,292,009 A (SMITH) 08 March 1994 (08.03.1994) entire document</td> <td>7</td> </tr> <tr> <td>A</td> <td>US 4,063,647 A (BLACKMORE) 20 December 1977 (20.12.1977) entire document</td> <td>1-14</td> </tr> <tr> <td>A</td> <td>US 1,459,582 A (DUBEE) 19 June 1923 (19.06.1923) entire document</td> <td>1-14</td> </tr> <tr> <td>A</td> <td>US 2005/0077332 A1 (PARSONS) 14 April 2005 (14.04.2005) entire document</td> <td>1-14</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 3,809,799 A (TAYLOR) 07 May 1974 (07.05.1974) entire document	1-5, 8, 12	X	JP 50-105149 U (SANPO DENKI) 29 August 1975 (29.08.1975) see machine translation	1, 6, 12-14	Y		7	X	US 4,932,625 A (HOTCHKISS, JR.) 12 June 1990 (12.06.1990) entire document	1, 8-11	Y	US 5,292,009 A (SMITH) 08 March 1994 (08.03.1994) entire document	7	A	US 4,063,647 A (BLACKMORE) 20 December 1977 (20.12.1977) entire document	1-14	A	US 1,459,582 A (DUBEE) 19 June 1923 (19.06.1923) entire document	1-14	A	US 2005/0077332 A1 (PARSONS) 14 April 2005 (14.04.2005) entire document	1-14
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<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed																		
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<p>Date of the actual completion of the international search 19 June 2015</p>		<p>Date of mailing of the international search report 08 JUL 2015</p>																											
<p>Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300</p>		<p>Authorized officer Blaine Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>																											