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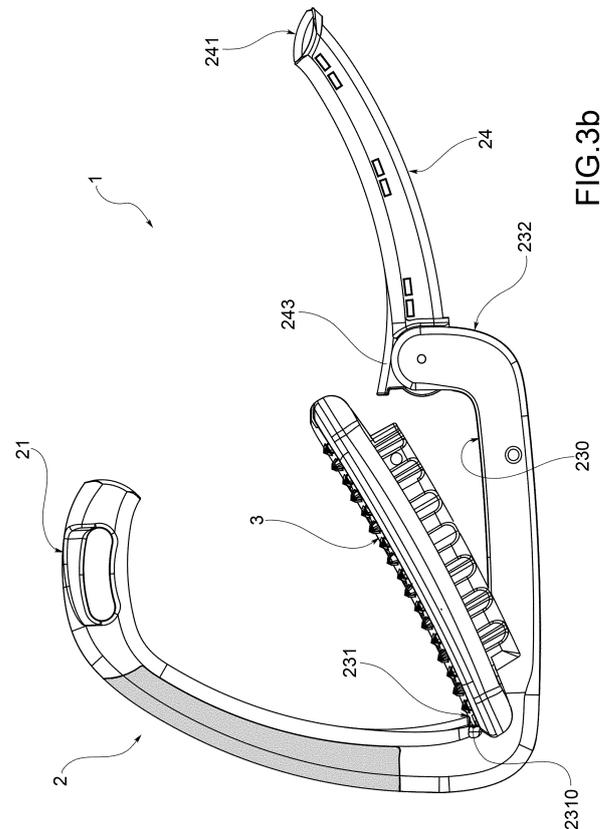
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(54) **STIRRUP FOR HORSE RIDING WITH REMOVABLE AND INTERCHANGEABLE TREAD**

(57) The horse riding stirrup (1), object of the present invention, comprises a frame (2) provided with a connection portion (21) for connecting to a bracket, a first side arm (22), a support arm (23) connected to the first side arm (22) and provided with a seat (230) with an undercut (231), and a second side arm (24) rotatable between a coupling configuration and an uncoupling configuration. Furthermore, the stirrup comprises a support element (3) for the foot of the user which is removably mounted onto the support arm (23), and provided with a first coupling portion (31) which may be wedged to the undercut portion (231) of the support element seat (230). The stirrup is characterized in that the second side arm comprises a locking means (243) suitable for locking the support element (3) in the support element seat (230) when the second side arm is in the coupling configuration.



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## Description

**[0001]** The present invention relates to a stirrup for horse riding. In particular, the present invention is in the field of stirrups for horse riding with a removable and interchangeable tread.

**[0002]** In the prior art, stirrups for horse riding are known wherein the tread, i.e., the support portion whereupon the rider rests the foot once mounted on a horse, is attached to the stirrup frame by mechanical means, such as screws. An example of a stirrup of the prior art is described in the document US 2019/144260 A1.

**[0003]** A typical problem with horse riding stirrups with the tread attached to the frame by mechanical locking means is the inability of the rider to independently remove the tread. In fact, the rider is not able to independently change a worn and/or damaged tread insofar as the fastening thereof requires that it be made secure, an operation that may only be carried out by specialized personnel. Therefore, in order to avoid reliance upon external assistance, the rider is forced to possess a second spare stirrup, with the relative attached tread.

**[0004]** A further problem with known stirrups concerns the risk of weakening the structure of the frame insofar as fastening by mechanical means requires making openings and/or holes in the frame of the stirrup with a consequent reduction in the mechanical resistance thereof to the stresses exerted by the rider during use. Horse riding stirrups of the prior art consequently involve high manufacturing complexity, with considerable implementation times and costs.

**[0005]** The object of the present invention is to provide a horse riding stirrup which solves the drawbacks of the prior art whilst taking into account the needs of the sector.

**[0006]** Such object is achieved by means of a stirrup according to claim 1 and a method for replacing a support element of a stirrup according to claim 12. The dependent claims describe preferred embodiments of the invention. Further features and advantages of the horse riding stirrup according to the present invention will appear more clearly from the following description, given as a non-limiting example in reference to the accompanying figures, in which:

- Figure 1 is a frontal view, in separate parts, of a horse riding stirrup according to one embodiment;
- Figure 2 is a perspective view of the frame of the horse riding stirrup in Figure 1, without the second movable side arm;
- Figure 3a is a front view of the stirrup of Figure 1, in a coupling configuration, without the support element;
- Figure 3b is a front view of the stirrup of Figure 1, in an uncoupling configuration, wherein the support element is partially inserted;
- Figure 3c is a front view of the stirrup of Figure 1, in an uncoupling configuration, wherein the support element is completely inserted;
- Figure 3d is a front view of the stirrup of Figure 1, in a

coupling configuration, with the support element completely inserted;

- Figure 4 is a perspective view of the stirrup in Figure 1, in a coupling configuration, with the support element fully inserted;
- Figure 5 is a bottom view of a component of the stirrup of Figure 1, and in particular of the support element.

**[0007]** With reference to the accompanying figures, a horse riding stirrup according to the present invention has been indicated with reference numeral 1.

**[0008]** The stirrup 1 comprises a frame 2 where to a support element 3 for the foot of a user is removably engaged. A support element plane P, visible in Figure 3d, is defined for reference.

**[0009]** The frame 2 comprises a connection portion 21 for connecting to a bracket, a first side arm 22, and a support arm 23 connected to the first side arm 22 in an incident manner for delimiting a frame compartment 10 engageable by the foot of a user. The first side arm 22 and the support arm 23 are made in one piece as a single body.

**[0010]** The support arm 23 defines a seat 230 where into the support element 3 may be inserted. The seat 230 is defined on one side (at the first side arm 22) by an undercut portion 231, and on the opposite side it is instead devoid of undercut portions or other transversely protruding elements.

**[0011]** The frame 2 comprises a second side arm 24 comprising a joint end 241, pivoted to the frame 2 about a rotation axis R, and a free end 242 rotatable between a configuration of coupling to the frame 2, wherein the second side arm 24 at least partially encloses the frame compartment 10, and a configuration of uncoupling from the frame 2.

**[0012]** According to one embodiment, the second side arm 24 has a length such that, in the coupling configuration, the free end 242 abuts against the frame 2.

**[0013]** According to a further embodiment, the second side arm 24 has a length such that, in the coupling configuration, it partially encloses the frame compartment 10. In other words, the second side arm 24 defines an opening between the free end 242 and the frame 2, not completely closing the frame compartment 10. In other words, the second side arm 24 is shorter than the first side arm 22.

**[0014]** As mentioned above, the stirrup 2 comprises a support element 3 for the foot of the user, mounted onto the support arm 23 inside the seat 230. The support element 3 comprises a first coupling portion 31 suitable for wedging below the undercut portion 231 of the support element seat 230, and a second coupling portion 32, opposite to the first coupling portion 31, intended to be engaged by a suitable locking mean 243 provided on the second side arm 24. In use, as shown in Figure 3b, by moving the second side arm 24 to the uncoupling configuration and rotating it up to the maximum opening

thereof (almost horizontal configuration), it is possible to insert the support element 3 into the seat 230, starting by wedging the first coupling portion 31 below the undercut 231, and then lowering the second coupling portion 32 to the horizontal position thereby resting in the seat 230.

**[0015]** Advantageously, the second side arm 24 comprises a locking mean 243 suitable for locking the support element 3 into the seat 230 when the second side arm 24 is in the coupling configuration.

**[0016]** Preferably, the locking mean 243 is a protruding flap of a substantially triangular shape having a surface suitable for defining the upper limit of the seat 230 for the support element 3 once the support element 3 is mounted onto the support arm 23.

**[0017]** In one embodiment shown in Figure 3a, the locking means 243 is made in one piece with the second side arm 24.

**[0018]** In a second embodiment, the locking means 243 constitutes an additional element suitable for being connected to the second side arm 24. In this example, the locking mean is made of a different material than that used for the second side arm 24.

**[0019]** In a third embodiment not shown in the accompanying figures, the locking mean 243 is connected to the second side arm 24 by elastic means that are suitable for moving it between an active configuration, wherein it protrudes with respect to the second side arm 24 inside the frame compartment 10 so as to define at least a portion of the seat 230 at the top, and a recessed configuration, wherein it is received at least partially in a suitable locking seat obtained in the second side arm.

**[0020]** According to an embodiment shown in Figures 3d and Figure 4, when the second side arm 24 is in the coupling configuration (wherein the free end 242 is in contact with the connection portion 21 of the frame 2) the support element 3 is constrained at the top by the locking mean 243, and thus held firmly in position in the seat 230. Preferably, the locking mean 243 is a second undercut portion 233, substantially equal to and opposite to the undercut portion 231.

**[0021]** Therefore, the locking system of the support element 3 is represented by the locking mean 243 of the second side arm 24, without the need for separate mechanical means such as screws or other similar elements. As a matter of fact, the support element 3 is not constrained to the support arm 23 by one or more mechanical fastenings, such as screws extending through the frame 2. Therefore, the locking system according to the present invention allows for a support element 3 (known as tread in the sector) of the removable and interchangeable type insofar as the user, independently, is able to replace it quickly and easily by simply opening the second side arm 24 in the uncoupling configuration, up to the point of maximum rotation thereof (visible in Figure 3b). The user does not therefore need to resort to the unscrewing of mechanical fastening means which could cause the reinforcing core and frame to break if not properly carried out by specialized personnel. The sup-

port arm 23 has in fact no mechanical fastenings passing through it in order to avoid weakening the mechanical strength thereof.

**[0022]** As may be seen in Figure 1, the undercut portion 231 is arranged in a first connecting zone 41 between the first side arm 22 and the support arm 23.

**[0023]** Preferably, the undercut portion 231 is a protruding flap of a substantially triangular shape having a surface 2310 suitable for defining the upper limit of the seat 230 for the support element 3 once the first coupling portion 31 of the same has been wedged to the undercut portion 231.

**[0024]** In an exemplary embodiment shown in Figure 3a, the undercut portion 231 is made in one piece with the first side arm 22.

**[0025]** In a second exemplary embodiment, the undercut portion 231 is an additional element that is suitable for being connected to the first side arm 22. In this example, the undercut portion is made of a different material than the one used for the first side arm 22.

**[0026]** In a third exemplary embodiment not shown in the accompanying figures, the undercut portion 231 is connected to the first side arm 22 by elastic means suitable for moving the undercut portion 231 between an active configuration, wherein the undercut portion is protruding with respect to the first side arm 22 within the frame compartment 10 to define at least one portion of the seat 230 at the top, and a recessed configuration, wherein the undercut portion 231 is at least partially housed within a suitable undercut seat obtained in the first side arm.

**[0027]** The seat 230 for the support element 3 is delimited on one side by the undercut portion 231 and on the opposite side by an end portion 232 without undercut portions or other transversely protruding elements.

**[0028]** According to one embodiment, the end portion 232 extends in an incident direction with respect to the plane P, wherein the seat 230 of the support element 3 extends. Preferably, the end portion 232 extends in a direction substantially perpendicular to the support element plane P. Preferably, the support arm 23 and the end portion 232 are made in one piece as a single body. The support arm 23 and the end portion 232 identify a second joining zone 42.

**[0029]** Therefore, the seat 230 of the support element 3 is delimited by the undercut portion 231 at the first joining zone 41 and by the end portion 232 at the second joining zone 42. The end portion 232 has an inner surface, i.e., facing the frame compartment 10, which is substantially smooth, i.e., without protrusions and/or depressions.

**[0030]** As may be seen in Figure 1, the frame 2 extends from the connection portion 21 to the end portion 232, and is preferably made in one piece as a single body.

**[0031]** According to one embodiment, the joint end 241 of the second side arm 24 is pivoted to the support arm 23 about the rotation axis R on an opposite side with respect to the undercut portion 231. In particular, the joint end 241 is pivoted to the end portion 232. According to such an

embodiment, the free end 242 of the second side arm 24 is rotatable between a coupling configuration and an uncoupling configuration from the connection portion 21 wherein it is spaced apart therefrom in order to create a lateral disengagement opening of the foot of the user from said frame compartment. According to such an embodiment, the locking means 243 is made at the joint end 241 of the second side arm 24.

**[0032]** According to such an embodiment, the end portion 232 comprises an access compartment 2320 suitable for containing a rotation mechanism of the second side arm 24. The rotation mechanism preferably comprises an elastic mean, such as a spring, which allows the second side arm to be moved from the uncoupling configuration to the coupling configuration.

**[0033]** Advantageously, the locking mean 243 is suitable for closing the access compartment 2320 at the seat 230 in such a way as to protect the rotation mechanism from any debris and/or dust during use. This allows the rotation mechanism to be preserved, reducing the need to intervene with stirrup maintenance interventions following breakages and/or malfunctions.

**[0034]** According to a second embodiment, the joint end 241 is pivoted to the connection portion 21 about the rotation axis R, on an opposite side with respect to the first side arm 22. According to such an embodiment, the free end 242 is rotatable between a coupling configuration and an uncoupling configuration from the support arm 23, wherein said second side arm 24 is spaced apart from the support arm 23 so as to create a lateral disengagement opening of the foot of the user from said frame compartment. According to such an embodiment, the locking mean 243 is implemented at the free end 242 of the second side arm 24.

**[0035]** In both of the configurations described above, the term coupling configuration refers to the configuration wherein the second side arm 24 is rotated so as to at least partially close the compartment 10 of the frame 2. The term uncoupling configuration refers to the configuration wherein the second side arm 24 is rotated so as to define a lateral access opening to the compartment 10 of the frame 2. The second side arm 24 is capable of switching from the coupling configuration, wherein it firmly holds the support element 3 in position (Figure 3d), to the uncoupling configuration wherein, when it is at the maximum opening rotation thereof, it allows for the disengagement of the support element 3 (Figure 3b and 3c).

**[0036]** Preferably, as may be seen in Figure 5, the support element 3 comprises, at the bottom, a longitudinal groove 33 suitable for being at least partially coupled in a form-fit to the seat 230 of the support element 3, visible in Figure 2, obtained in the support arm 23. In order to improve the stability of the engagement element in the seat 230, two protruding and parallel containment flaps 331 are also provided.

**[0037]** Furthermore, the support element 3 has a plurality of protrusions 60 at the top to keep the foot of the user in position. In other words, the plurality of protrusions 60

creates a grip surface, i.e., greater friction between the sole of the footwear worn by the user and the support element 3.

**[0038]** According to one embodiment, the connection portion 21 comprises at least one hole or slot 210 which at least partially passes through the thickness of the frame 2. Preferably, said hole 210 completely passes through the thickness of the frame 2.

**[0039]** According to one embodiment, the frame 2 is made at least partially of a polymeric material. Preferably, the frame 2 comprises a reinforcing core. The reinforcing core is preferably made of a metallic material. In one exemplary embodiment, the polymeric material is co-molded onto the reinforcing core. In a further exemplary embodiment, the polymeric material is overmolded onto the reinforcing core. According to one embodiment, the reinforcement core 20 is completely embedded in the polymeric material 200.

**[0040]** The reinforcing core extends from the connection portion 21 along the first side arm 22 and along at least part of the support arm 23. Preferably, the reinforcing core extends from the connection portion 21, along the first side arm 22 and along the entire support arm 23. In other words, the reinforcing core is made in one piece as a single body which extends from the connection portion 21 to the support arm 23.

**[0041]** Preferably, as may be seen in Figure 4, at least one side arm, between the first side arm 22 and the second side arm 24, comprises at least one groove 50 that is suitable for being engaged by a removable insert 4. For example, the insert 4 is snap-fitted into the groove 50. The insert 4 is an accessory component used to customize the stirrup, object of the present invention. As a matter of fact, the user may insert an insert element 4, for example of a preferred color or with lettering or other graphical elements, to embellish and customize the horse riding stirrup thereof.

**[0042]** In one example, only the first side arm 22 comprises the groove 50 with an insert 4. In a further example, only the second side arm 24 comprises the groove 50 with an insert 4. In yet another example, both the first side arm 22 and the second side arm 24 each comprise at least one groove 5 with an insert 4.

**[0043]** Object of the present invention is also a method for replacing a support element of a stirrup 1 for horse riding as described above. Such method includes the steps of:

- rotating the second side arm 24 to an uncoupling configuration;
- disassembling the support element 3 from the support arm 23 removing the first coupling portion 31 from below the undercut portion 231 of the support element seat 230;
- mounting the replacement support element to the support arm 23 by wedging the relative first coupling portion below the undercut portion 231 of the support element seat 230;

- rotating the second side arm 24 to the coupling configuration so that the locking mean 243 engages the support element 3 thereby fixing it in the support element seat 230.

**[0044]** Innovatively, the horse riding stirrup according to the present invention makes it possible to have a removable and interchangeable support element thereby overcoming the typical problems of the prior art in that the rider may, independently, change said support element (known as tread in the sector) without the need to resort to specialized personnel.

**[0045]** Advantageously, the horse riding stirrup with a removable and interchangeable tread according to the present invention allows for a reduction in production times and costs.

**[0046]** Advantageously, the horse riding stirrup with a removable and interchangeable tread according to the present invention allows for a stirrup with greater mechanical resistance to the stresses exerted by the foot of the user to be obtained, insofar as it lacks holes or other openings for mechanical fastening means, such as screws, which would cause a considerable weakening of the reinforcing core and, more generally, of the frame.

**[0047]** Advantageously, the stirrup according to the present invention allows for rapid replacement of the tread in the event of damage or breakage, even during a horse riding excursion: in this way the user may continue to ride thereby preserving the safety thereof.

**[0048]** Advantageously, the stirrup according to the present invention also has a reinforcing core made in one piece, as a single body, which allows the mechanical properties of the materials used in the construction to be maintained, and reduces the possibility of structural damage to a minimum.

**[0049]** It is clear that a person skilled in the art may make changes to the invention described above in order to meet incidental needs, which changes all fall within the scope of protection as defined in the following claims.

## Claims

1. A stirrup (1) for horse riding comprising:

- a frame (2) provided with:

- a connection portion (21) to a stirrup leather;
- a first side arm (22);
- a support arm (23) incidentally connected to the first side arm (22), for delimiting a frame compartment (10) engageable by a user's foot, wherein said support arm (23) identifies a seat (230) laterally defined by an undercut portion (231);
- a second side arm (24) comprising

a joint end (241), pivoted to the frame (2) about a rotation axis (R), and a free end (242), rotatable between a coupling configuration, wherein the second side arm (24) at least partially encloses the frame compartment (10), and an uncoupling configuration, wherein the frame compartment (10) is laterally accessible;

- a support element (3) for the user's foot, wherein said support element (3) is mounted to the support arm (23) and comprises a first coupling portion (31), wedgeable below the undercut portion (231) of the support element seat (230);

**characterized in that** the second side arm (24) comprises a locking means (243) suitable for locking the support element (3) in the support element seat (230) when the second side arm (24) is in the coupling configuration.

2. Stirrup (1) for horse riding according to claim 1, wherein the joint end (241) is pivoted to the support arm (23) on an opposite side with respect to the undercut portion (231).
3. Stirrup (1) for horse riding according to claim 1 or 2, wherein the locking means (243) is made at the joint end (241) of the second side arm (24).
4. Stirrup (1) for horse riding according to any one of the preceding claims, wherein, in the coupling configuration, said locking means (243) defines a second undercut portion (233) opposite to the undercut portion (231) of the support arm (23).
5. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the support element (3) comprises a longitudinal groove (33) at the bottom, suitable for being coupled in shape at least partially to the support element seat (230) of said support arm (23).
6. Stirrup (1) for horse riding according to any one of the preceding claims, wherein at least the first side arm (22) and the support arm (23) are made in one piece in a single body.
7. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the support element seat (230) is laterally delimited by an end portion (232), opposite to the undercut portion (231), which is devoid of undercut portions or other transversely protruding elements.
8. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the first side arm (22)

and/or the second side arm (24) comprises at least one groove (50) provided with a removable insert (4).

9. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the support element (3) is provided at the top with a plurality of gripping protrusions (60). 5
10. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the undercut portion (231) is made in one piece with the first side arm (22) or is a distinct element from the first side arm (22). 10
11. Stirrup (1) for horse riding according to any one of the preceding claims, wherein the undercut portion (231) is a distinct element from the first side arm (22) and is at least partially housed in an undercut seat made in the first side arm (231); 15  
 wherein elastic means move said undercut portion (231) between an active configuration, wherein it protrudes with respect to the first side arm (22), and a recessed configuration, wherein it is housed in said undercut seat. 20
12. A method for replacing a support element of a stirrup (1) for horse riding comprising the steps of: 25
- providing a stirrup (1) according to any one of the preceding claims, and a replacement support element; 30
  - rotating the second side arm (24) to the uncoupling configuration;
  - disassembling the support element (3) from the support arm (23) removing the first coupling portion (31) from below the undercut portion (231) of the support element seat (230); 35
  - mounting the replacement support element to the support arm (23) by wedging the first coupling portion thereof below the undercut portion (231) of the support element seat (230); 40
  - rotating the second side arm (24) to the coupling configuration so that the locking means (243) engages the support element (3), fixing it in the support element seat (230). 45

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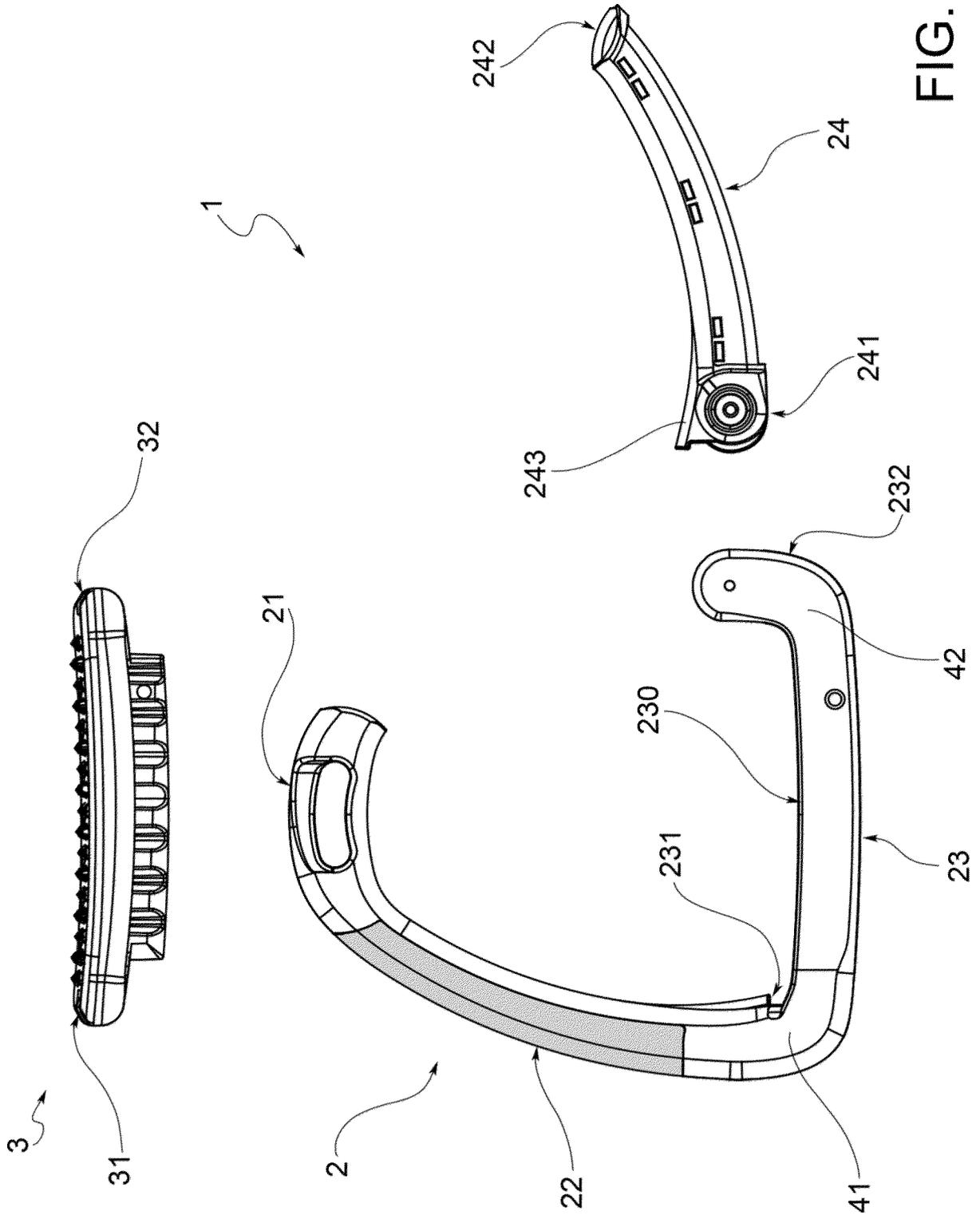
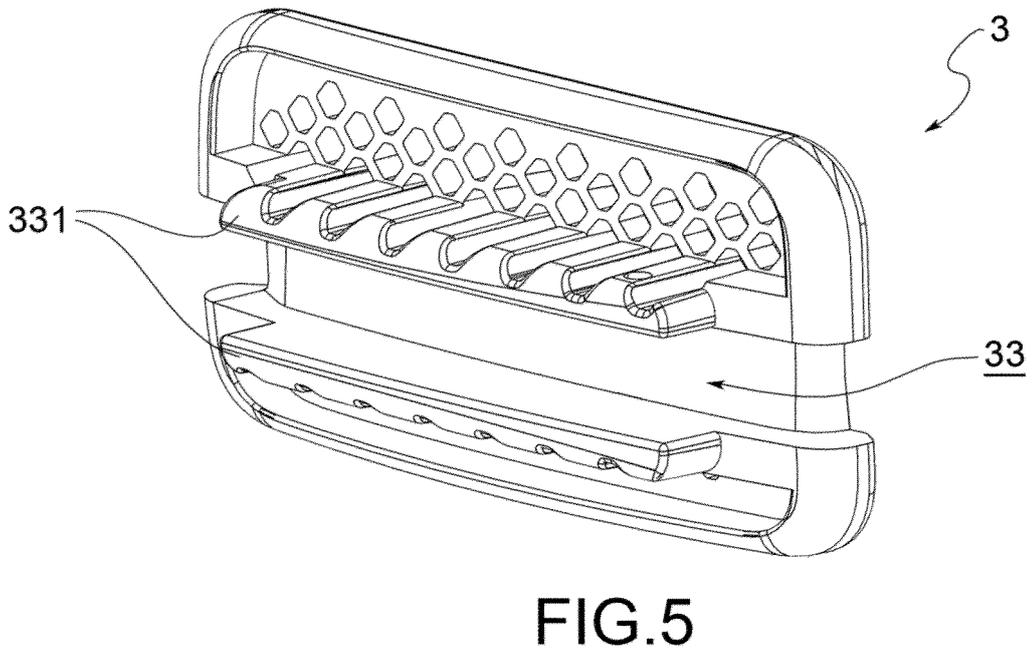
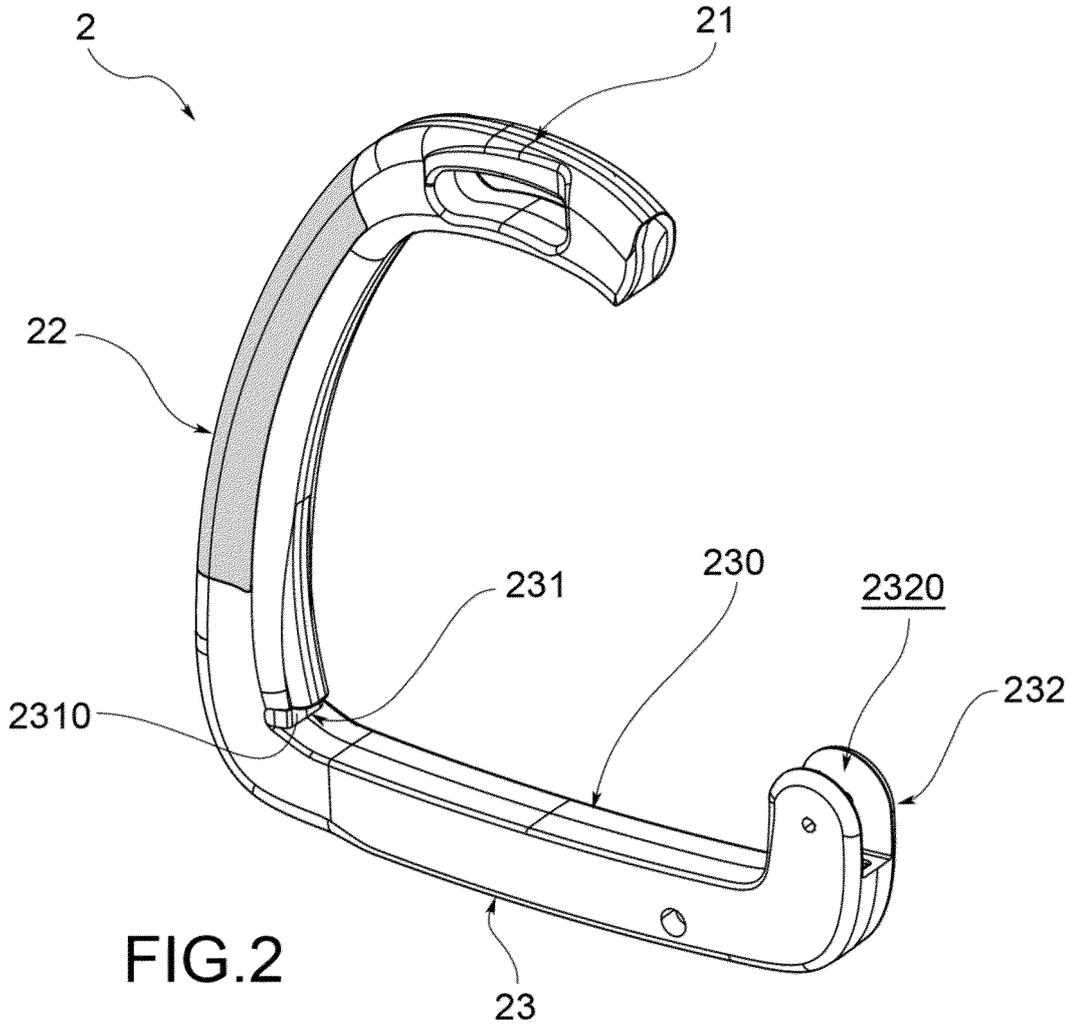


FIG.1



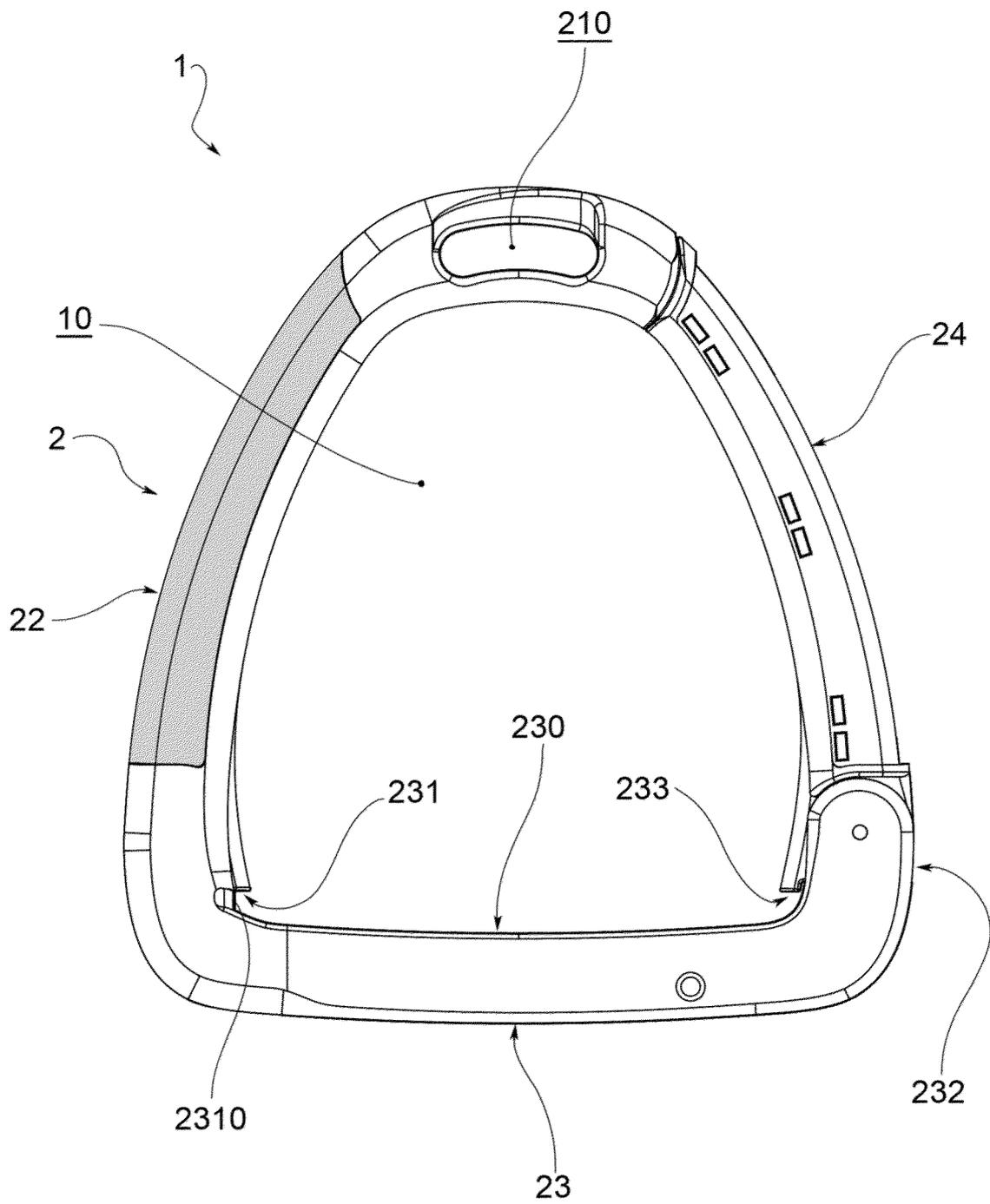


FIG.3a

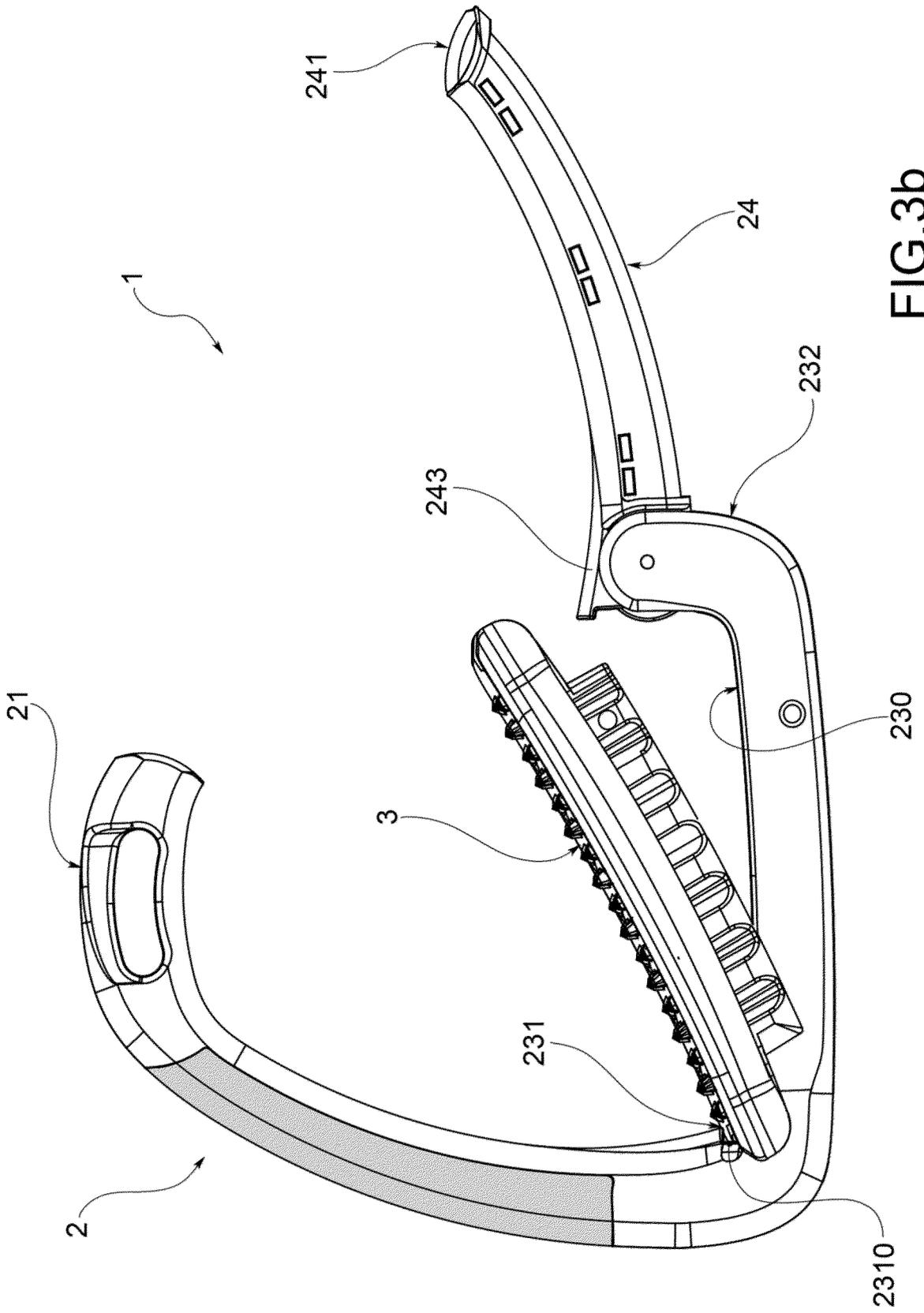


FIG. 3b

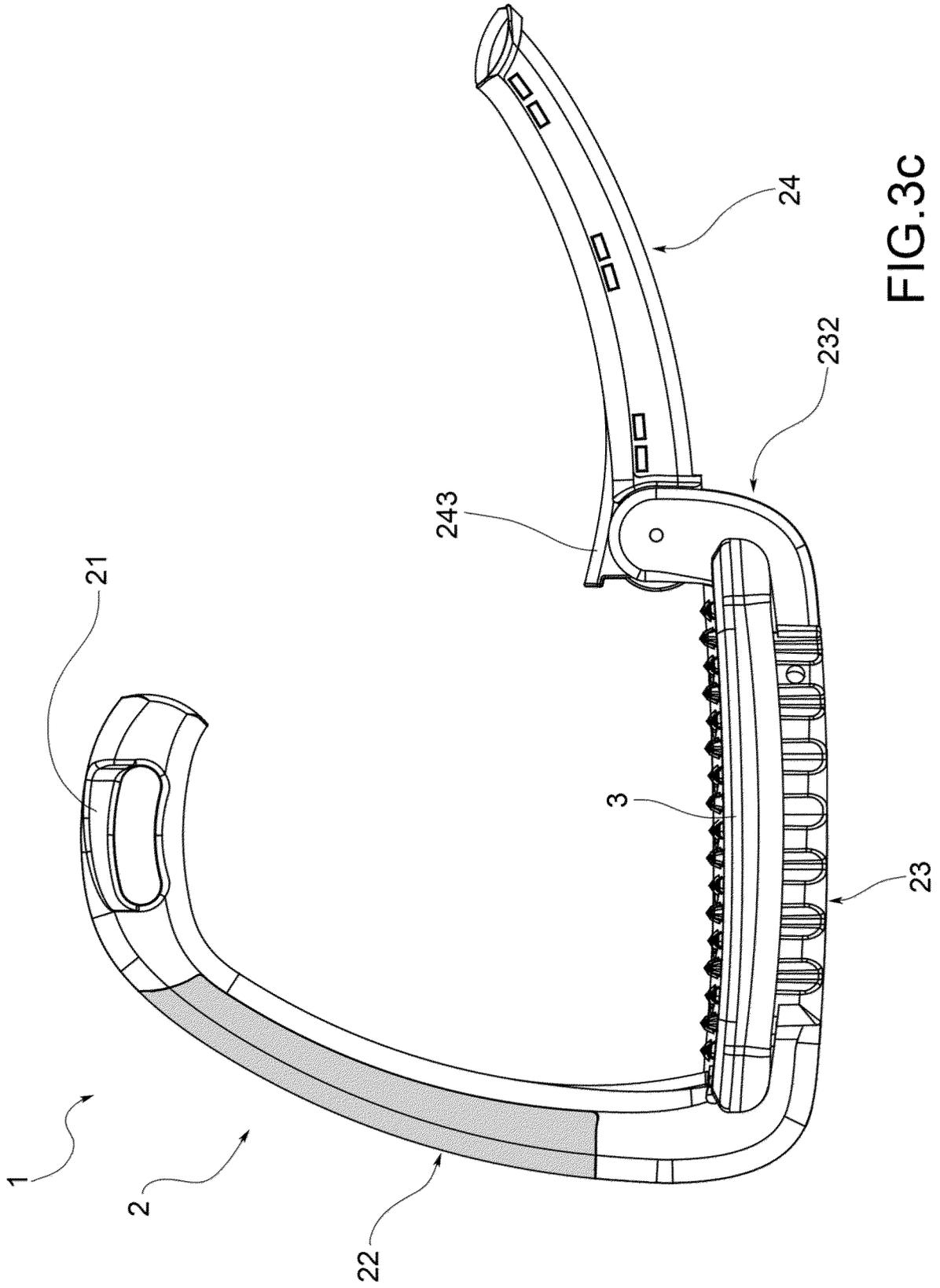


FIG.3C

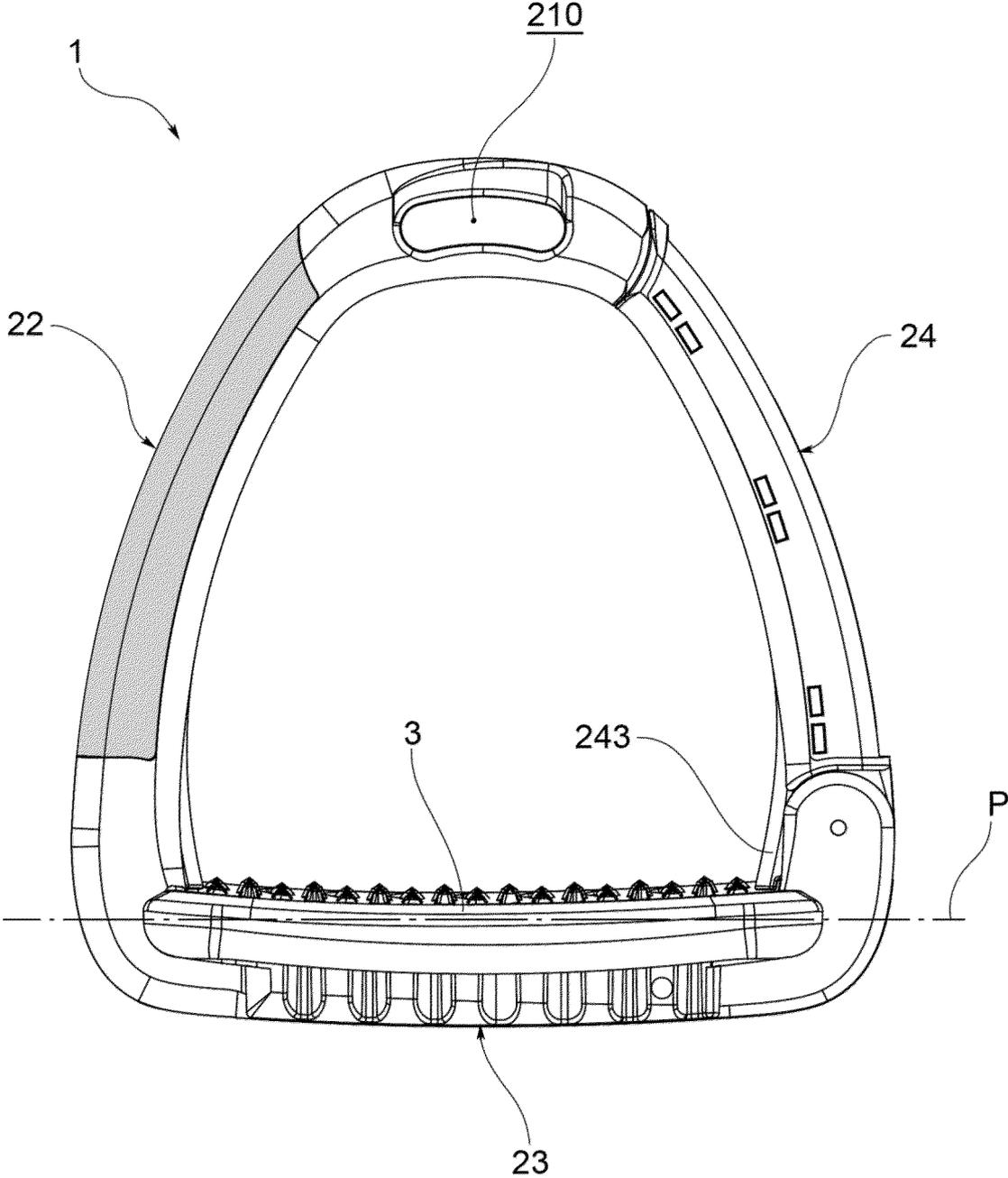


FIG.3d

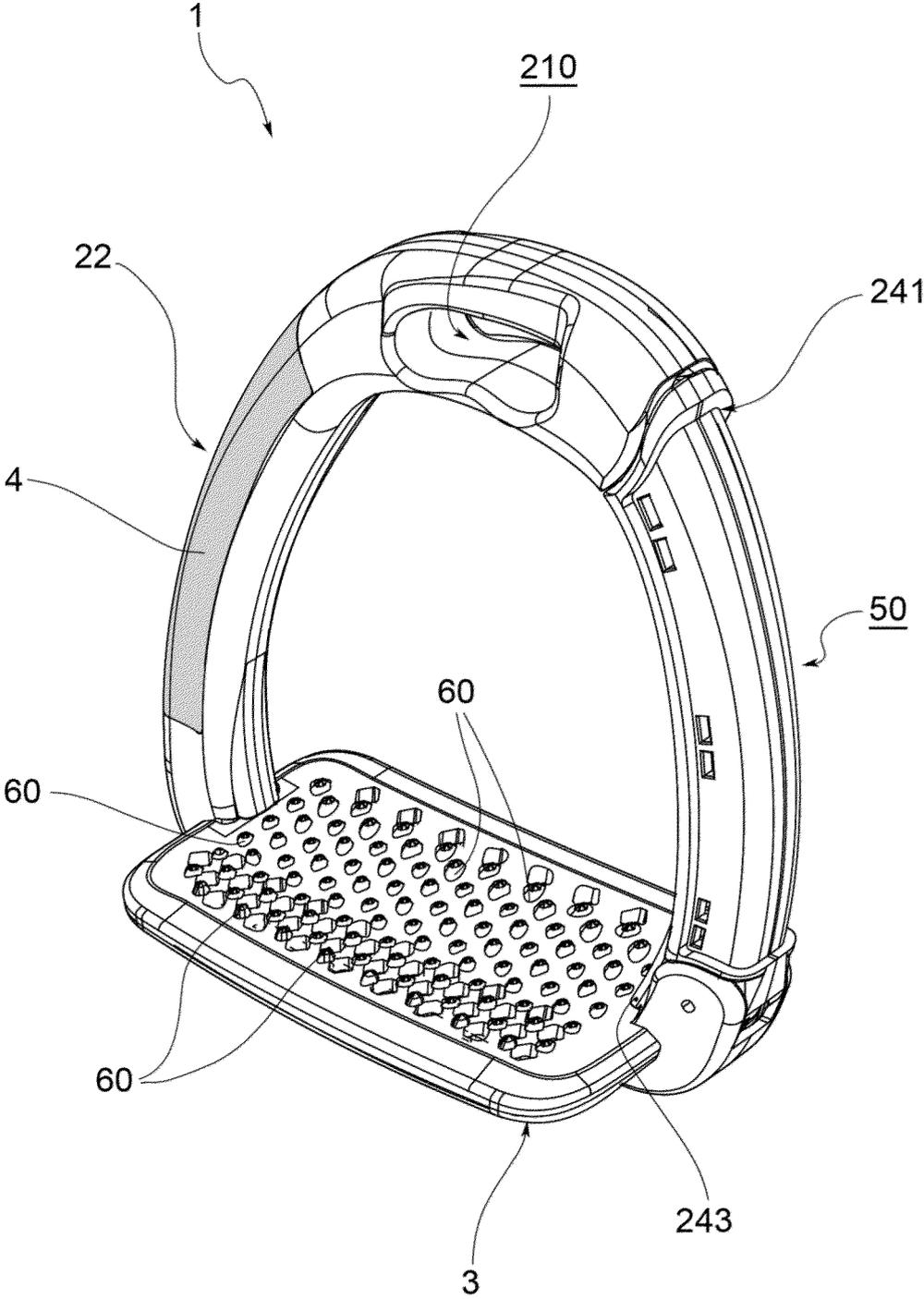


FIG.4



EUROPEAN SEARCH REPORT

Application Number  
EP 24 18 7444

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2019/144260 A1 (BENETTI MAURO [IT]) 16 May 2019 (2019-05-16) * abstract * * paragraphs [0001] - [0102] * * figures 1-10 * * claims 1-15 * -----	1-12	INV. B68C3/02 B68C3/00
			TECHNICAL FIELDS SEARCHED (IPC)
			B68C B68F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		13 September 2024	Espeel, Els
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 24 18 7444

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019144260 A1	16-05-2019	EP 3445707 A2	27-02-2019
		US 2019144260 A1	16-05-2019
		WO 2017182941 A2	26-10-2017
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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