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(54) **STIRRUP FOR HORSE RIDING SADDLES**

(57) The present invention relates to a stirrup (10) for horse-riding saddles, comprising:

- a support element (11) to support a user's foot,
- and an open arch (12) extending from the opposite ends of the support element;

this open arch (12) in turn comprises:

- a first load-bearing half-arch (13) extending from a first lateral portion (14) of said support element (11) and comprising an attachment portion (15) configured for fastening a stirrup strap,

- and a second containment half-arch (16), extending from a second lateral portion (17) of said support element (11), opposite to said first lateral portion (14), the second half-arch (16) comprising a lower part (18) configured to be constrained to the support element (11), and an upper part (19) extending from the lower part (18) up to near the attachment portion (15).

The second half-arch (16) comprises a single body of elastically deformable plastic material (20) on which the lower part (18) and the upper part (19) are defined.

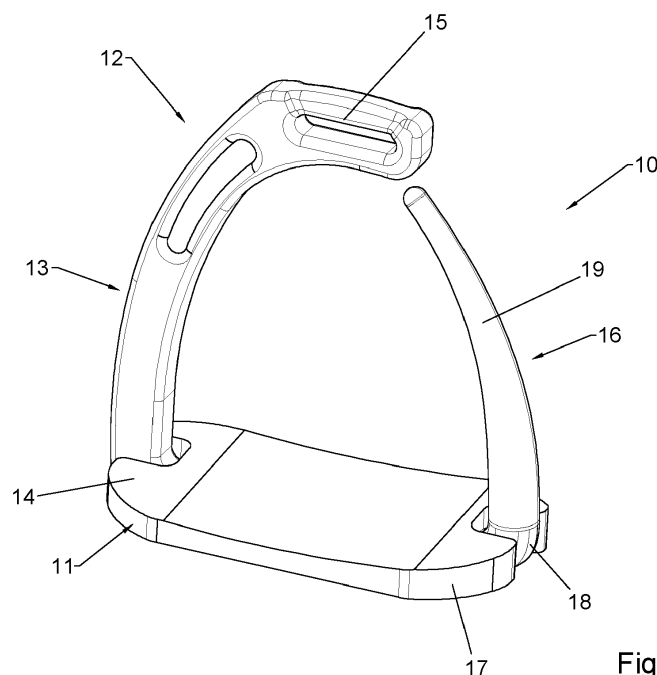


Fig.1

Description

[0001] The invention relates to a stirrup for horse-riding saddles.

[0002] Nowadays, in the context of horse-riding activities, there is increasing awareness of the need for the rapid release of the foot of a person who is riding a horse in the event of being unsaddled and falling from the horse in general.

[0003] Since closed arch stirrups are not able to ensure the rapid release of the foot thereof, stirrups for horse-riding saddles were developed in the prior art, comprising:

- a support element, generally a plate, where the user's foot rests,
- and an open arch extending from the opposite ends of said support element.

[0004] This open arch usually comprises:

- a first load-bearing half-arch, extending from a first lateral portion of the support element comprising an attachment portion configured for engaging the stirrup strap, or belt,
- and a second containment half-arch, extending from a second lateral portion of the support element, opposite to the first lateral portion, the second half-arch comprising a lower part configured to be secured to the support element, and an upper part extending from said lower part up to near the attachment portion.

[0005] The second half-arch is configured to be elastically deformable in a specific direction, so as to deform reversibly in the event that the rider falls, thus enabling the rapid release of the foot inserted in the stirrup in order to prevent the rider from being injured.

[0006] A similar stirrup is described in the European Patent EP 2438003 B1.

[0007] This type of horse-riding stirrup, although widespread and appreciated, has some drawbacks.

[0008] A first drawback is related to the fact that this second half-arch, as described for example in the aforementioned patent, is able to deform elastically thanks to a series of incisions and grooves in its central part, configured in such a way as to favor the bending of the second half-arch in question in a single direction with respect to an antero-posterior direction corresponding to the normal use of the stirrup, while in the opposite direction the bending is substantially prevented.

[0009] The same incisions and grooves can also enable the bending of the second half-arch towards the outside, on a plane substantially orthogonal to the antero-posterior direction.

[0010] This type of flexible half-arch is therefore very limited in its functionality as a safety system, since it is able to ensure suitable bending in only two directions,

whereas, in contrast, the foot of a rider falling from a horse may need to be released from the stirrup by moving in one or more directions other than those provided for by the known stirrup described above.

[0011] A second drawback is related to the fact that a similar second half-arch as described above can be made, in plastic material, by using a complex and therefore expensive mold.

[0012] The aim of the present invention is to provide a stirrup for horse-riding saddles capable of overcoming the aforementioned drawbacks and limitations of the prior art.

[0013] In particular, one object of the invention is to provide a stirrup for horse-riding saddles capable of ensuring the release of the foot resting thereon in any direction.

[0014] Another object of the invention is to provide a stirrup the construction of which requires simpler equipment than stirrups of the prior art.

[0015] A further object of the invention is to provide a stirrup that is simple to assemble.

[0016] The intended purpose and the aforementioned objects are achieved by a stirrup for horse-riding saddles according to claim 1.

[0017] Further characteristics of the stirrup according to claim 1 are described in the dependent claims.

[0018] The intended purpose and the aforementioned objects, together with the advantages that will be explained below, are highlighted in the description of an embodiment of the invention, which is provided, by way of non-limiting example, with reference to the accompanying drawings, wherein:

- Figure 1 shows a first perspective view of a stirrup according to the invention;
- Figure 2 shows a second perspective view of a stirrup according to the invention;
- Figure 3 shows a first perspective view of a detail of the stirrup according to the invention;
- Figure 4 shows a second perspective view of a stirrup according to the invention;
- Figure 5 shows a first exploded perspective view of the stirrup according to the invention;
- Figure 6 shows a second exploded perspective view of the stirrup according to the invention;
- Figure 7 shows a rear view of the stirrup according to the invention;
- Figures 7a, 7b and 7c each show a cross section of a component of the stirrup according to the invention;
- Figure 8 shows a rear section view of the stirrup according to the invention;
- Figure 9 shows a perspective section of the stirrup according to the invention;
- Figure 10 shows an exploded perspective view of a variant embodiment of a stirrup according to the invention;
- Figure 11 shows a sectional view of the plan view of

the variant embodiment of the stirrup according to the invention as shown in Figure 10;

- Figure 12 shows a cross-sectional view along the section line XII-XII of Figure 11;
- Figure 13 shows a cross-sectional view along the section line XIII-XIII of Figure 11.

[0019] With reference to the aforementioned figures, a stirrup for horse-riding saddles according to the invention is indicated as a whole with the number **10**.

[0020] This stirrup **10** for horse-riding saddles comprises:

- a support element **11** to support a user's foot,
- and an open arch **12** extending from the opposite ends of the support element **11**.

[0021] The term 'open arch' is understood to mean an arch interrupted in one point, that is, having an area of discontinuity between two of its generic portions hereinafter referred to as 'half-arches'.

[0022] The open arch **12** in turn comprises:

- a first load-bearing half-arch **13**, extending from a first lateral portion **14** of the support element **11** comprising an attachment portion **15** configured for engaging a strap, the latter of which is not shown for simplicity,
- and a second containment half-arch **16**, extending from a second lateral portion **17** of the support element **11**, on the opposite side of said first lateral portion **14**; the second half-arch **16** comprises a lower part **18** configured to be secured to the support element **11**, and an upper part **19** extending from the lower part **18** up to near the attachment portion **15**.

[0023] In the embodiment described herein, which clearly does not limit the invention, the support element **11** comprises a shaped plate; the support element **11**, alternatively, may be made of a bar or another body which together with the open arch **12** forms an annular assembly in which a user's foot can be inserted.

[0024] The distinctive feature of the stirrup **10** according to the invention lies in the fact that the second half-arch **16** comprises a single body made of elastically deformable plastic material **20** defining the lower part **18** and the upper part **19**. In particular, the upper part **19** extends along a development curved line **X** indicated and visible in Figure 7.

[0025] In particular, the second half-arch **16** consists of a single body made up of elastically deformable plastic material **20** defining the lower part **18** and the upper part **19**.

[0026] The upper part **19** extends from its lower end **19a** which comprises part of the single body **20**, the lower end **19a** of which is located substantially in correspondence with the upper surface **11a** of the support element **11**, along the curved line **X**, up to its upper end **19b** lo-

cated in proximity to, or in contact with, a facing end **15a** of the attachment portion **15**.

[0027] Between the upper end **19b** and the facing end **15a** of the attachment portion **15**, for example, there is a gap ranging from 1 millimeter to 20 millimeters.

[0028] In a variant embodiment, not shown for the sake of simplicity, the upper end **19b** is in contact with the attachment portion **15**.

[0029] Still in particular, this upper part **19** has a cross section at any of its points, orthogonal to the development curved line **X**, having a circular or oval profile. Still in particular, in the direction which runs from the lower end **19a** to the upper end **19b**, the cross-sectional area of the upper part **19** decreases.

[0030] In particular, as is clear from the figures, the cross-sectional area of the upper part **19** decreases without interruption; in fact the upper part **19** has no grooves, notches, recesses, or areas from which part of the material has been removed which cause a decrease of the cross section and a subsequent enlargement of the same, that is which cause a discontinuity in the decrease of the cross section which is intended as going along the upper part **19** along the development curved line **X** from the lower end **19a** towards the upper end **19b**.

[0031] Figures 7a, 7b and 7c respectively show sections VII(A), VII(B) and VII(C) of Figure 7, having profiles **7a**, **7b** and **7c** respectively.

[0032] These figures show how the cross section at each point of a plane orthogonal to the development curved line **X** has a circular profile.

[0033] As noted above, these cross sections can alternatively have an oval profile or other similar and equivalent curved profile.

[0034] The profile **7a** is of a transverse section located in proximity to the upper end **19b**.

[0035] The profile **7b** is of a cross section located in a central area of the upper part **19**.

[0036] The profile **7c** is a cross section located in proximity to the lower end **19a**.

[0037] The radius of the circular profile **7a** is therefore smaller than the radius of the circular profile **7b** which in turn is smaller than the radius of the circular profile **7c**.

[0038] The upper part **19** of the second half-arch **16** therefore has a frusto-conical portion which extends along a development curved line **X**, rather than along a straight line orthogonal to the base.

[0039] This distinctive feature of the upper part **19** of the second half-arch **16** of having a circular cross-section at any of its points enables the upper part **19** to flex elastically in all radial directions with respect to the development curved line **X**, not only in an antero-posterior direction or in a direction orthogonal to this antero-posterior direction, as in the aforementioned stirrups of the prior art. The lower part **18** of the second half-arch **16** forms a single body with the upper part **19**.

[0040] The lower part **18** extends below the support element **11**.

[0041] In particular, in the present non-limiting embod-

iment of the invention, the support element **11** has a fastening seat **22**.

[0042] The lower part **18** of the second half-arch **16** is configured to rest in this fastening seat **22**.

[0043] By way of a non-exclusive example, this fastening seat **22** is made up of a groove open downwards according to a normal use of the stirrup **10**.

[0044] The lower part **18** has an upper surface **18a** shaped to rest against a facing surface **22a** of the fastening seat **22**.

[0045] The lower part **18** and the upper part **19** are joined by a connecting portion **20a**.

[0046] The lower part **18** is constrained to the support element **11** by means of an insert **23** positioned partly in a corresponding first hole **24** on the lower part **18** and partly in a corresponding coaxial second hole **24a** defined on the support element **11**.

[0047] The union of the upper surface **18a** of the lower part **18** which faces the surface **22a** of the fastening seat **22** prevents the rotation of the second half-arch **16** around the main symmetry axis of the insert **23**.

[0048] Said insert **23** is, for example, a threaded element, but it may also be a through insert having other similar or equivalent shapes.

[0049] The single body **20** of the second half-arch **16** is preferably made of elastomeric material.

[0050] This single body **20** is made for example of polyurethane.

[0051] This elastomeric material preferably has a hardness in the range of 80 to 100 Shore.

[0052] This elastomeric material also preferably has a hardness of 95 Shore.

[0053] The peculiar shape of the upper part **19** of the second half-arch **16**, curved and with a circular section which decreases from the bottom upwards results in an upper part **19** which is more rigid towards the lower end **19a**, where the upper part **19** provides a containment function to prevent the foot of a user from sliding off the support element **11** laterally, and less rigid as it goes towards the upper end **19b** where, on the other hand, less rigidity is required in the event that the user falls.

[0054] The first half-arch **13** also has a lower part **25** configured to be constrained to the support element **11**.

[0055] In the present embodiment, as is clearly visible from the figures, the lower part **25** is made up of a portion with a mainly longitudinal development defining a substantially 'C' shaped body with the first half-arch **13**.

[0056] In particular, the lower part **25** is configured to rest in the groove open downwards, that is, in the fastening seat **22**.

[0057] The lower part **18** of the second half-arch **16** is also inserted in the fastening seat **22**.

[0058] Since the lower part **18** forms the single body **20** with the upper part **19**, and since this single body **20** is only connected to the support element **11** through the insert **23**, the upper part **19** is free to also bend elastically in the connecting portion **20a** between the lower part **18** and the upper part **19**; in fact, the connecting portion **20a**

is free from rigid constraints and can bend elastically when stressed by a foot of a user.

[0059] Similarly to the lower part **18** of the second half-arch **16**, the lower part **25** of the first half-arch **13** is also fastened to the support element **11** with one or more through inserts, for example a through insert **27**.

[0060] A variant embodiment of the stirrup according to the invention is shown in Figures 10 to 13 and indicated therein by the number **110**.

[0061] Also in this variant embodiment, the stirrup **110** comprises:

- a support element **111**,
- a first half-arch **113**, comprising an attachment portion configured for fastening a stirrup strap,
- and a second containment half-arch **116**, comprising a lower part **118** configured to be constrained to the support element **111**, and an upper part

[0062] **119** extending from the lower part **118** up to near the attachment portion. The first half-arch **113** also has a lower part **125** configured to rest in the fastening seat **122** of the support element **111**.

[0063] Also in this variant embodiment, the lower part **125** consists of a portion with a mainly longitudinal development that together with the first half-arch **113** results in a substantially 'C' shaped body.

[0064] The lower part **125** of the first half-arch **113** is fastened to the support element **111** with one or more through inserts, for example a through insert **127**.

[0065] In this variant embodiment, the lower part **125** has lateral fixing reliefs **125a** and **125b** respectively.

[0066] These lateral fixing reliefs **125a** and **125b**, clearly visible in Figures 10 and 11, are composed of, in the present embodiment, corresponding lateral ribs, each extending on a corresponding side of the lower part **125**.

[0067] These lateral fixing reliefs **125a** and **125b** give the lower part **125** a 'T' shaped cross section, as can be seen in the cross section view of Figure 11.

[0068] The fastening seat **122** has longitudinal grooves **122a** and **122b** both shaped to house a corresponding lateral fixing relief **125a** and **125b**.

[0069] The fastening seat **122** therefore has two opposing anti-extraction shoulders **122c** and **122d** which are in contact with a corresponding lateral fixing relief **125a** and **125b**.

[0070] The first half-arch **113** comprises a portion extending upwards **113a**, the attachment portion as described above and visible in Figures 1 to 8, and a joint area **113b** located between the portion extending upwards **113a** and the attachment portion.

[0071] In particular, and preferably, the lateral fixing reliefs **125a** and **125b** extend from the joint area **113b** to near the opposite end of the lower part **125**, and at least for half the length of the lower part **125**; in this way the coupling of the lower part **125** with the fastening seat **122**, thanks to the cooperation between the lateral fixing reliefs **125a** and **125b** with the corresponding anti-ex-

traction shoulders **122c** and **122d** of the support element **111**, causes the stirrup **110** to have greater resistance to torsional stresses that the lower part **125** receives from the support element **111**, which is in turn stressed by the user's foot.

[0072] In particular, torsional loads on the lower part **125**, thanks to the lateral fixing reliefs **125a** and **125b**, are transmitted to the joint area **113a**, which is more robust and resistant.

[0073] Advantageously, the lower part **118** of the second half-arch **116** also has two opposite lateral fixing reliefs **118a** and **118b**, as can be seen in the cross section view in Figure 12.

[0074] The fastening seat **122** also comprises two longitudinal grooves **122e** and **122f** both shaped to house a corresponding lateral fixing relief **118a** and **118b**.

[0075] The fastening seat **122** therefore has two opposing shoulders **122c** and **122d** which are in contact with a corresponding lateral fixing relief **118a** and **118b**.

[0076] In the present embodiment, the fastening seat **122** has a first transverse width **A** in correspondence with the longitudinal grooves **122a** and **122b** for the lateral fixing reliefs **125a** and **125b** of the lower part **125**, and a second transverse width **B** in correspondence with the longitudinal grooves **122e** and **122f** for the lateral fixing reliefs **118a** and **118b** of the lower part **118** of the second half-arch **116**; the first transverse width **A** has a different size than the second transverse width **B**; in particular, the second transverse width **B** is greater than the first transverse width **A**.

[0077] It is clear that the invention achieves the intended purpose and objects.

[0078] In particular, the invention achieves a stirrup for horse-riding saddles capable of ensuring the release of a foot resting thereon in any direction, thanks to the special shape of the upper part **19** of the second semi-arch **16**.

[0079] Furthermore, the invention achieves a stirrup, the manufacturing of which requires simpler equipment than that of the stirrups of the known art, since the upper part **19** intended to flex in all directions does not have grooves, recesses or holes that require a complex mold with undercuts and sliders.

[0080] In addition, the stirrup of the invention is easy to assemble.

[0081] The invention thus conceived can be subjected to numerous modifications and variations, all of which are within the scope of the inventive concept; moreover, all components can be replaced by others which are technically equivalent.

[0082] In practical terms, the elements and materials used could be of any type, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, according to the requirements and the state of the art. Where the characteristics and methods mentioned in any claim are indicated by reference signs, these reference signs are to be understood merely for the purpose of increasing the intelligibility of the claims

and consequently such reference signs have no limiting effect on the interpretation of any of the elements identified by such reference signs by way of example.

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Claims

1. Stirrup (10) for horse-riding saddles, comprising:

- a support element (11), to support a user's foot,
- and an open arch (12) extending from the opposite ends of said support element,

said open arch (12) in turn comprising:

- a first load-bearing half-arch (13) extending from a first lateral portion (14) of said support element (11) and comprising an attachment portion (15) configured for fastening a stirrup strap,
- and a second containment half-arch (16), extending from a second lateral portion (17) of said support element (11), opposite to said first lateral portion (14), said second half-arch (16) comprising a lower part (18) configured to be constrained to said support element (11), and an upper part (19) extending from said lower part (18) up to near said attachment portion (15), said second half-arch (16) comprising a single body of elastically deformable plastic material (20) defining said lower part (18) and said upper part (19),

characterized in that

said upper part (19) extends along a development curved line (X),

said upper part (19) extends from its lower end (19a), being a part of the single body (20), the lower end (19a) of which is located substantially in correspondence with an upper surface (11a) of said support element (11), along said curved line (X), up to an upper end (19b) thereof positioned in proximity to, or in contact with, a facing end (15a) of said attachment portion (15), the cross-sectional area of said upper part (19) decreasing in the direction which runs from said lower end (19a) to said upper end (19b).

2. Stirrup according to the preceding claim, **characterized in that** said upper part (19) has a transversal section at any of its points, orthogonal to said development curved line (X), having a circular or oval profile.

3. Stirrup according to one or more of the preceding claims, **characterized in that** said upper part (19) of the second half-arch (16) has a frusto-conical portion which extends along a development curved line (X).

4. Stirrup according to one or more of the preceding claims, **characterized in that** said cross-sectional area of the upper part (19) decreases without interruption, said upper part (19) having no grooves, notches, recesses or areas from which part of the material has been removed. 5

5. Stirrup according to one or more of the preceding claims, **characterized in that** said lower part (18) extends below said support element (11), said support element (11) having a fastening seat (22), said lower part (18) of the second half-arch (16) being configured to rest in said fastening seat (22). 10

6. Stirrup according to one or more of the preceding claims, **characterized in that** also said first half-arch (13) has a lower part (25) configured to be constrained to said support element (11), said lower part (25) being configured to rest in said fastening seat (22). 15 20

7. Stirrup according to one or more of the preceding claims, **characterized in that** said lower part (125) has lateral fixing reliefs (125a, 125b), said fastening seat (122) having longitudinal grooves (122a, 122b) shaped to each receive a corresponding lateral fixing relief (125a, 125b). 25

8. Stirrup according to one or more of the preceding claims, **characterized in that** said single body (20) of the second half-arch (16) is preferably made of elastomeric material. 30

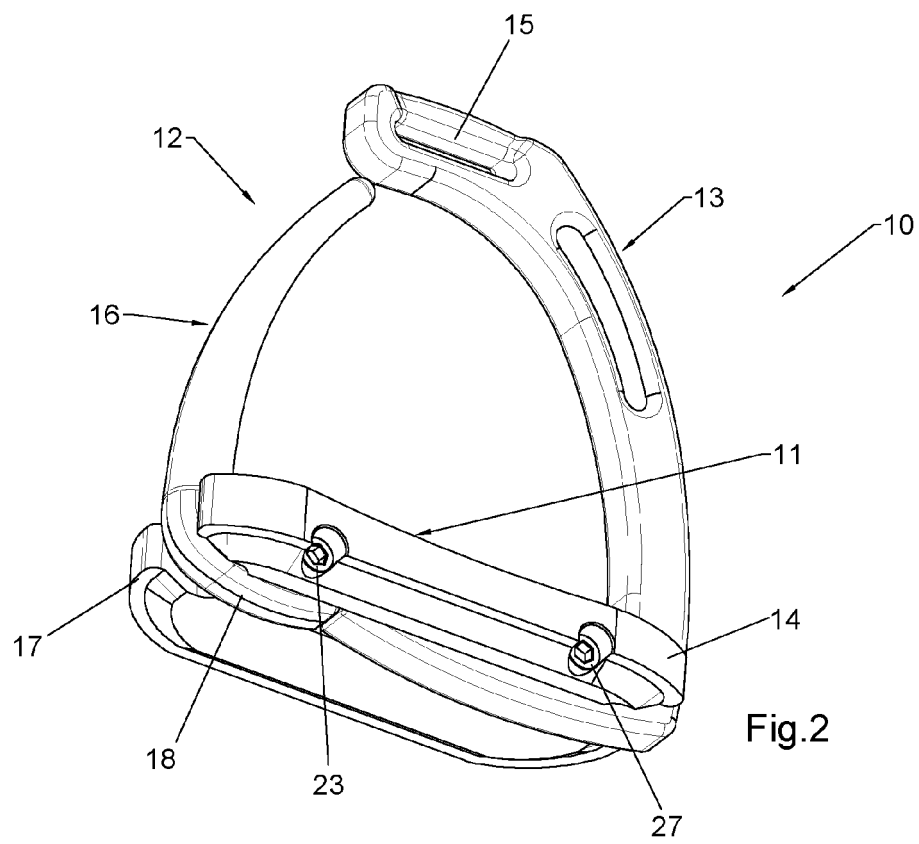
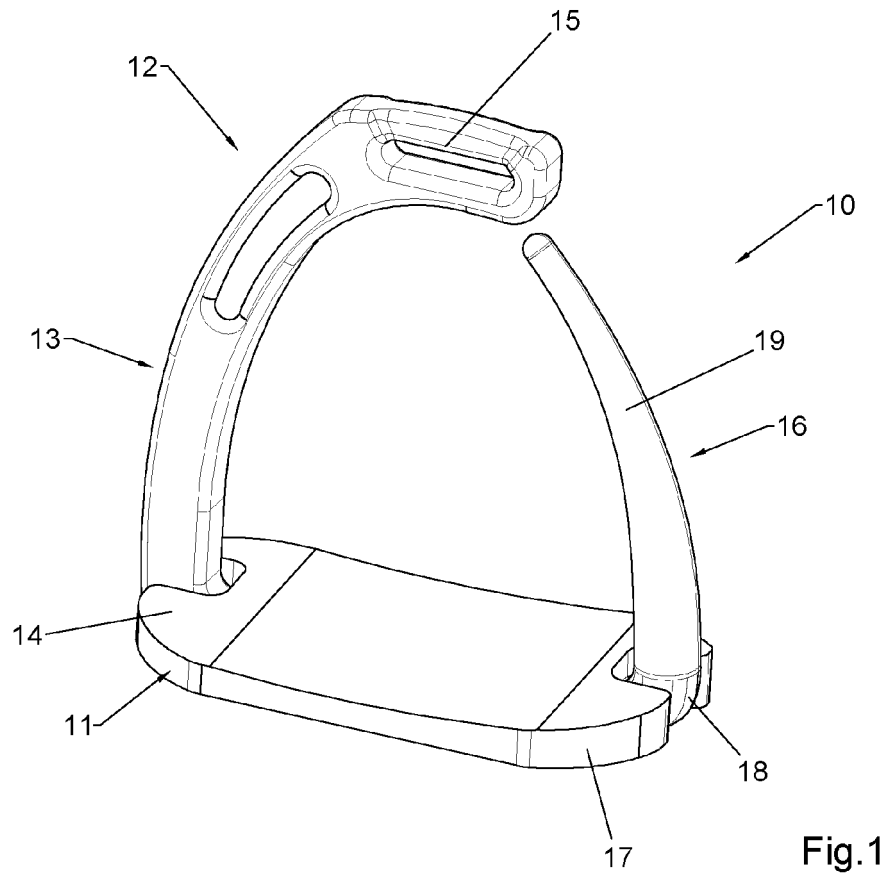
9. Stirrup according to the preceding claim, **characterized in that** said single body (20) is made of polyurethane. 35

10. Stirrup according to one or more of the preceding claims, **characterized in that** said elastomeric material has a hardness comprised in a range between 80 and 100 Shore. 40

11. Stirrup according to one or more of the preceding claims, **characterized in that** said elastomeric material has a hardness of 95 Shore. 45

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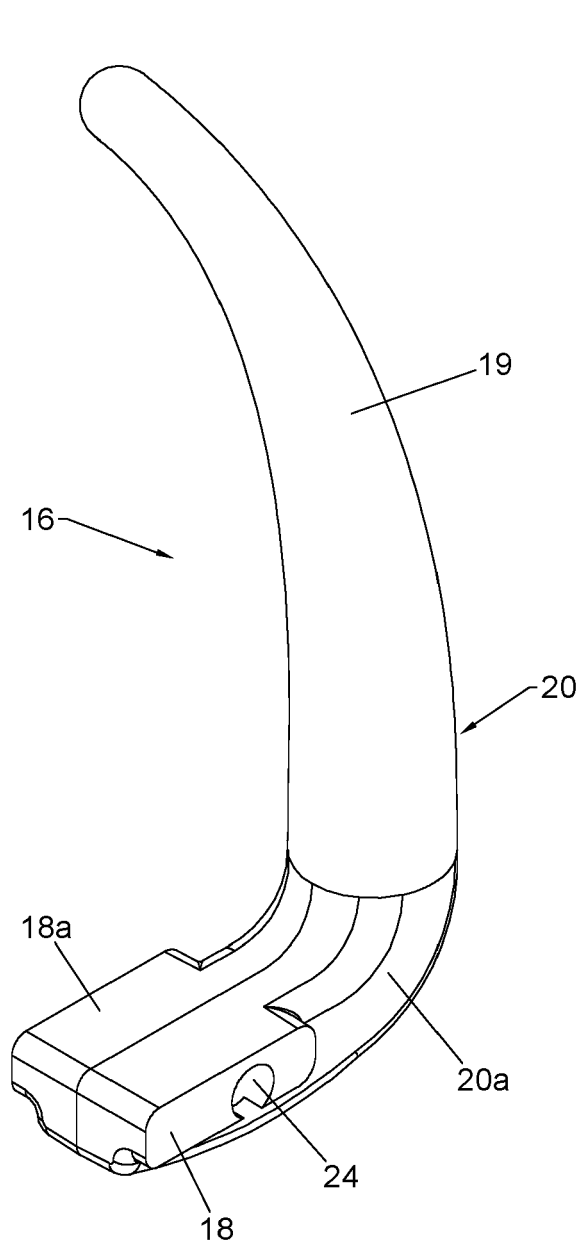


Fig.3

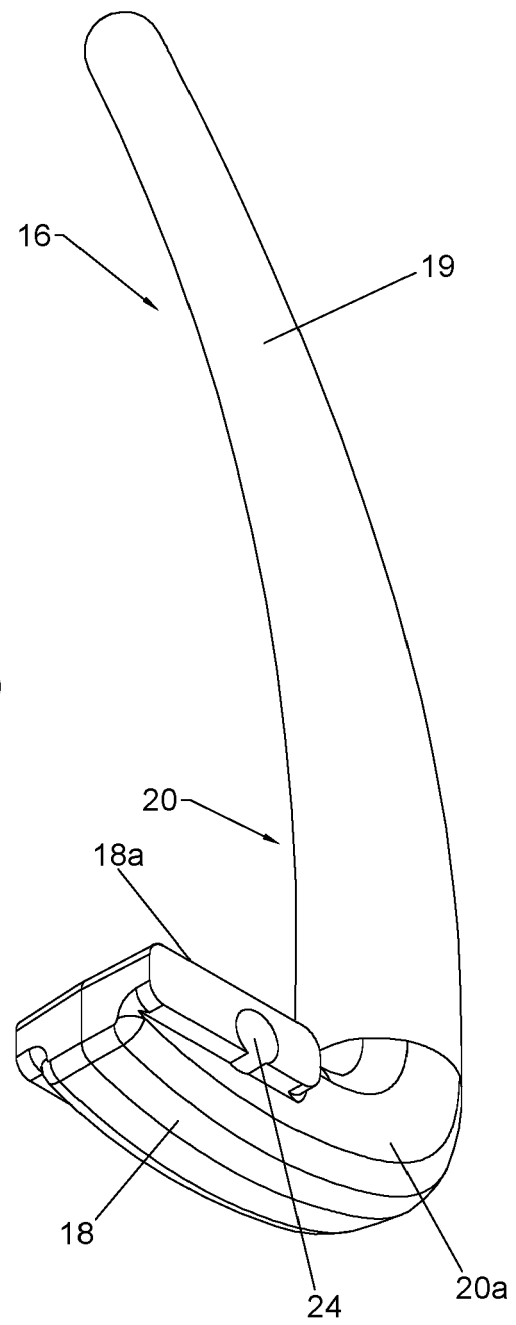


Fig.4

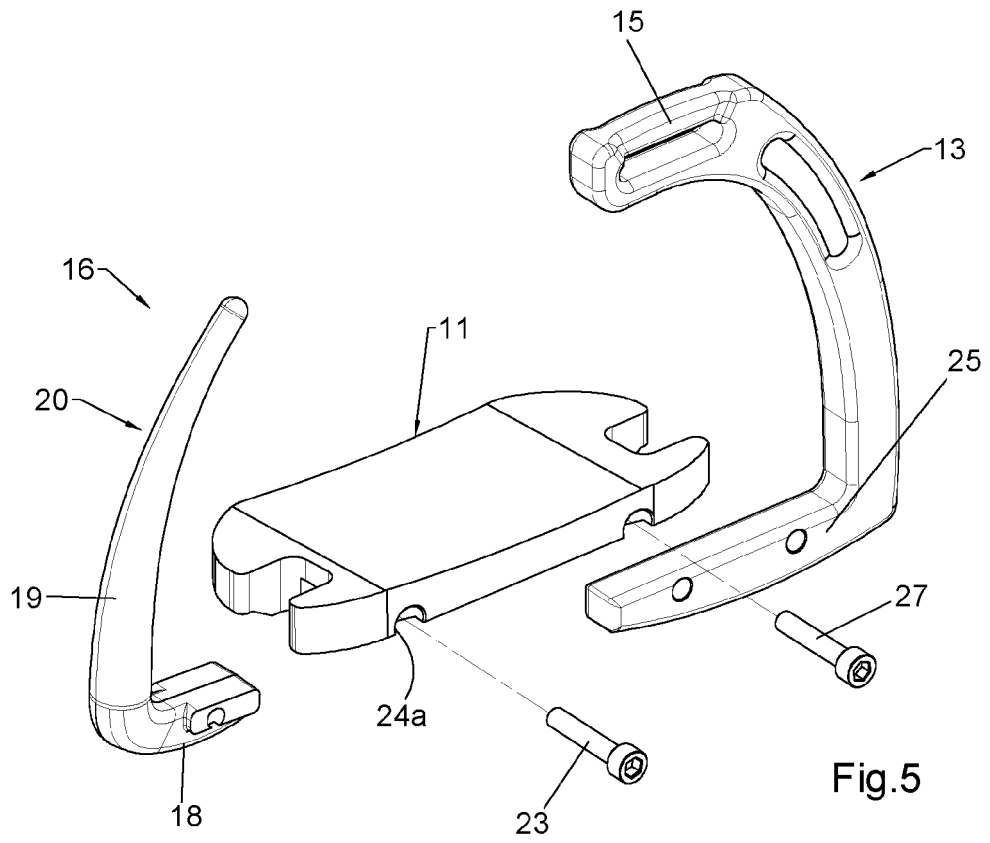


Fig.5

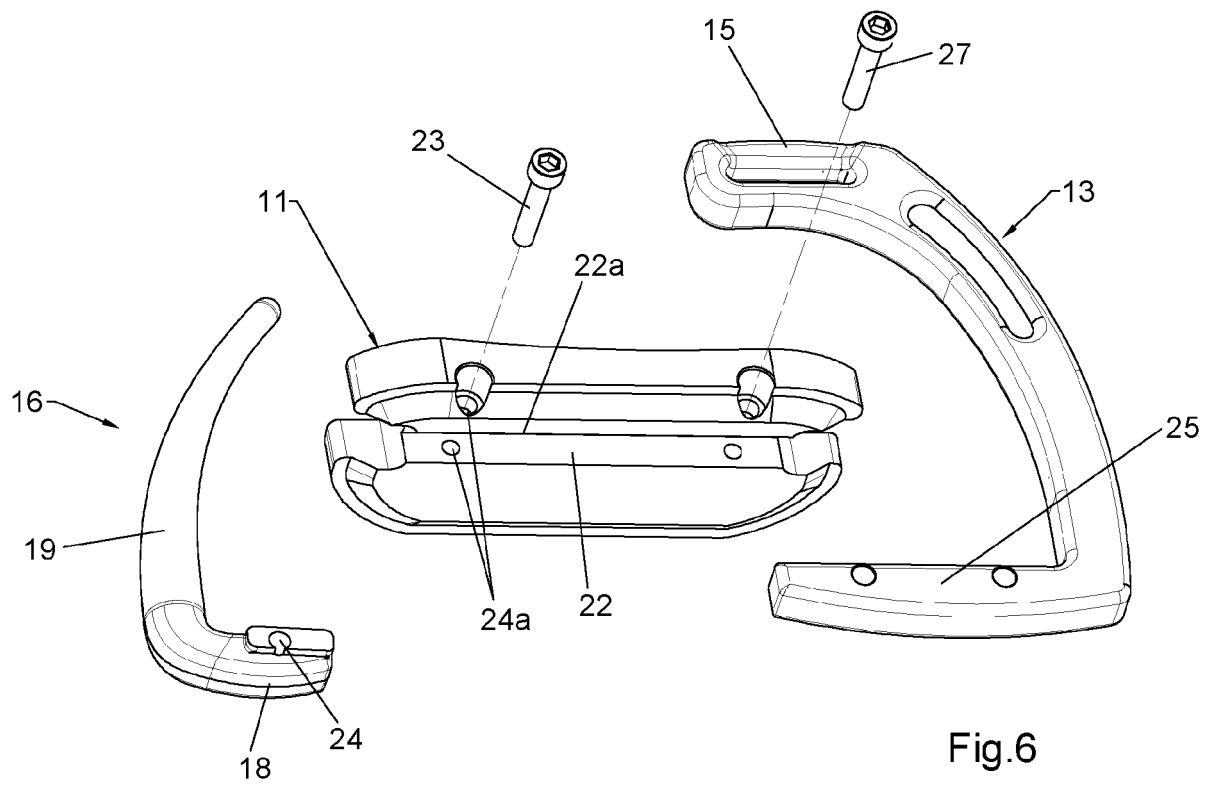
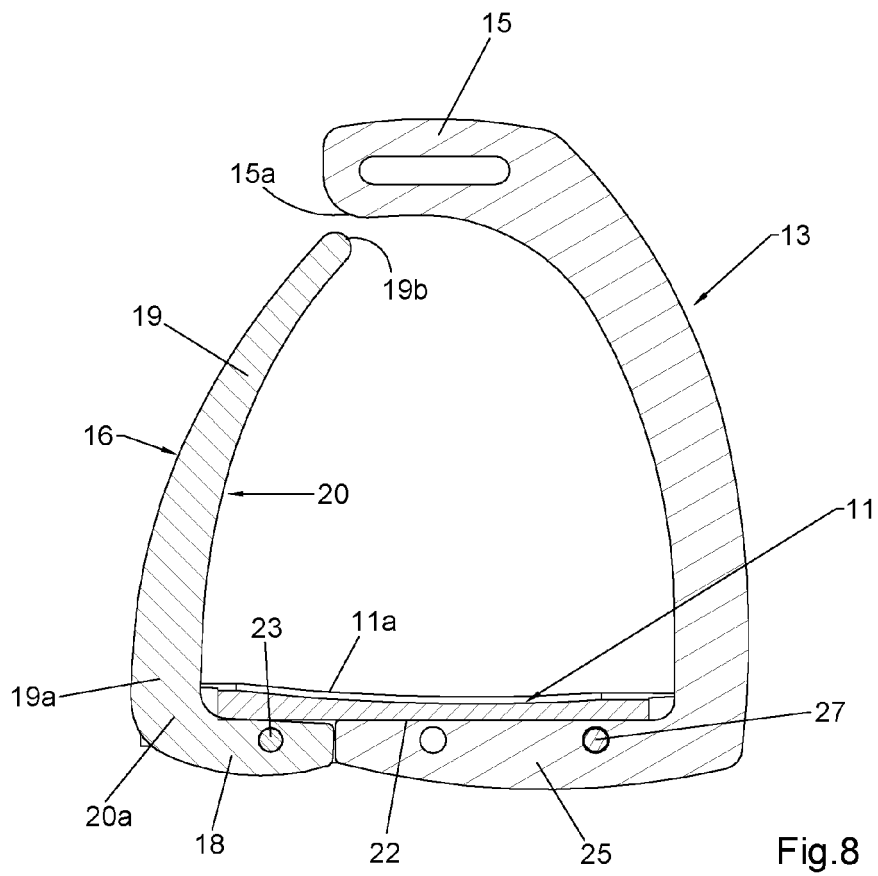
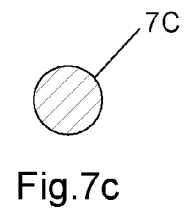
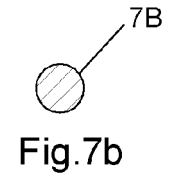
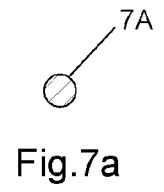
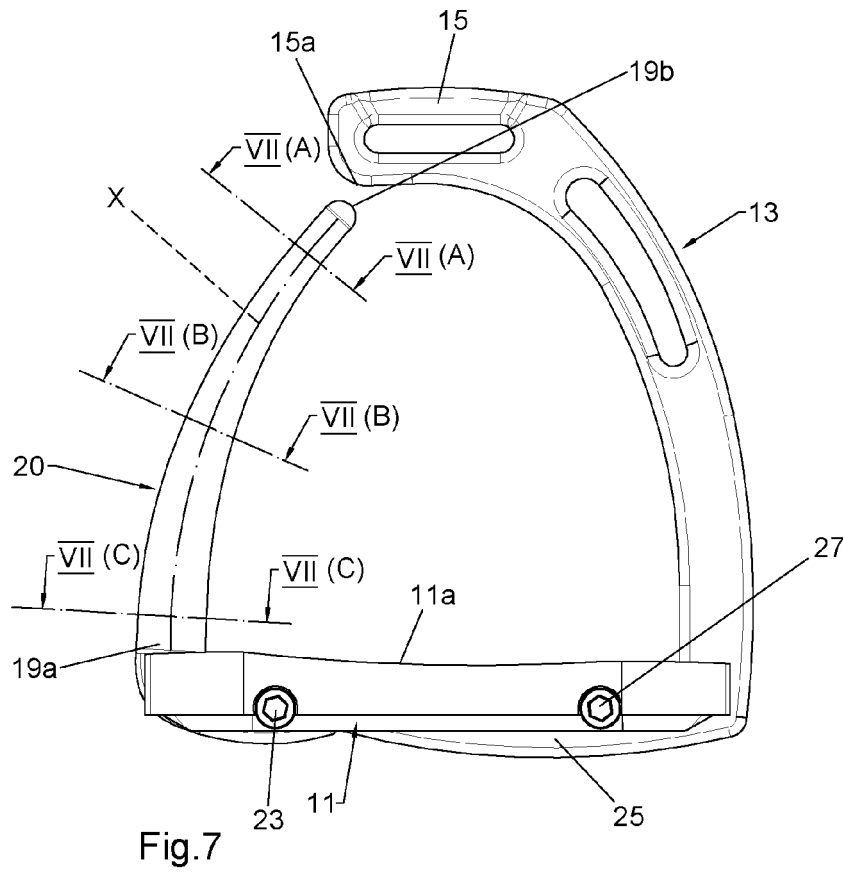
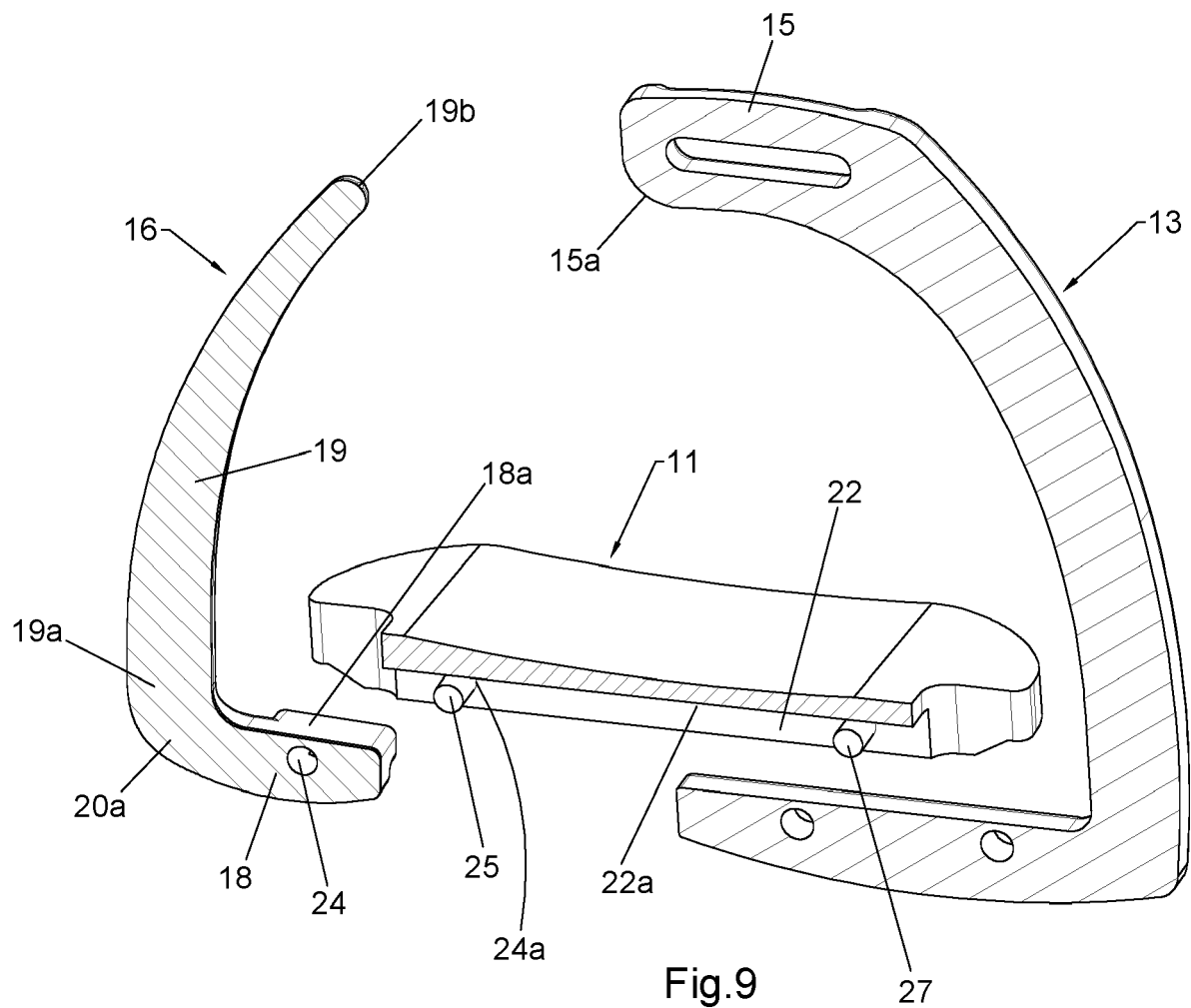


Fig.6





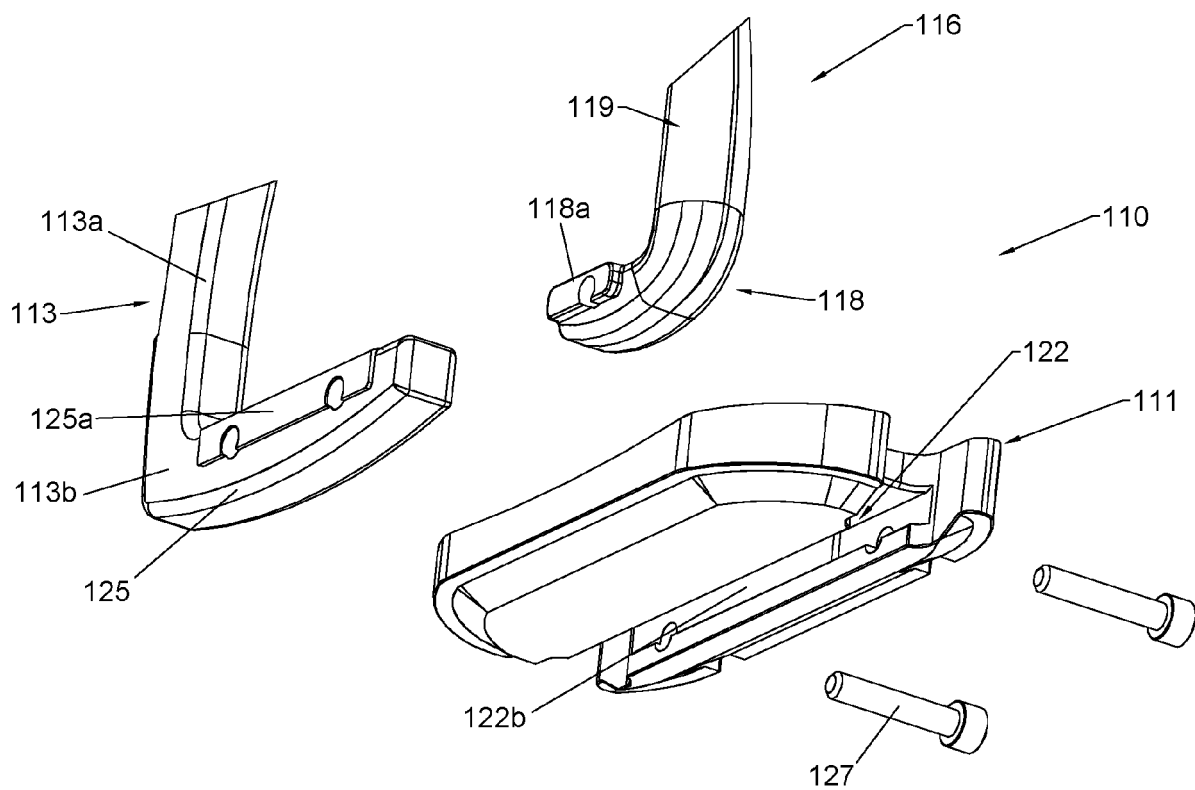


Fig.10

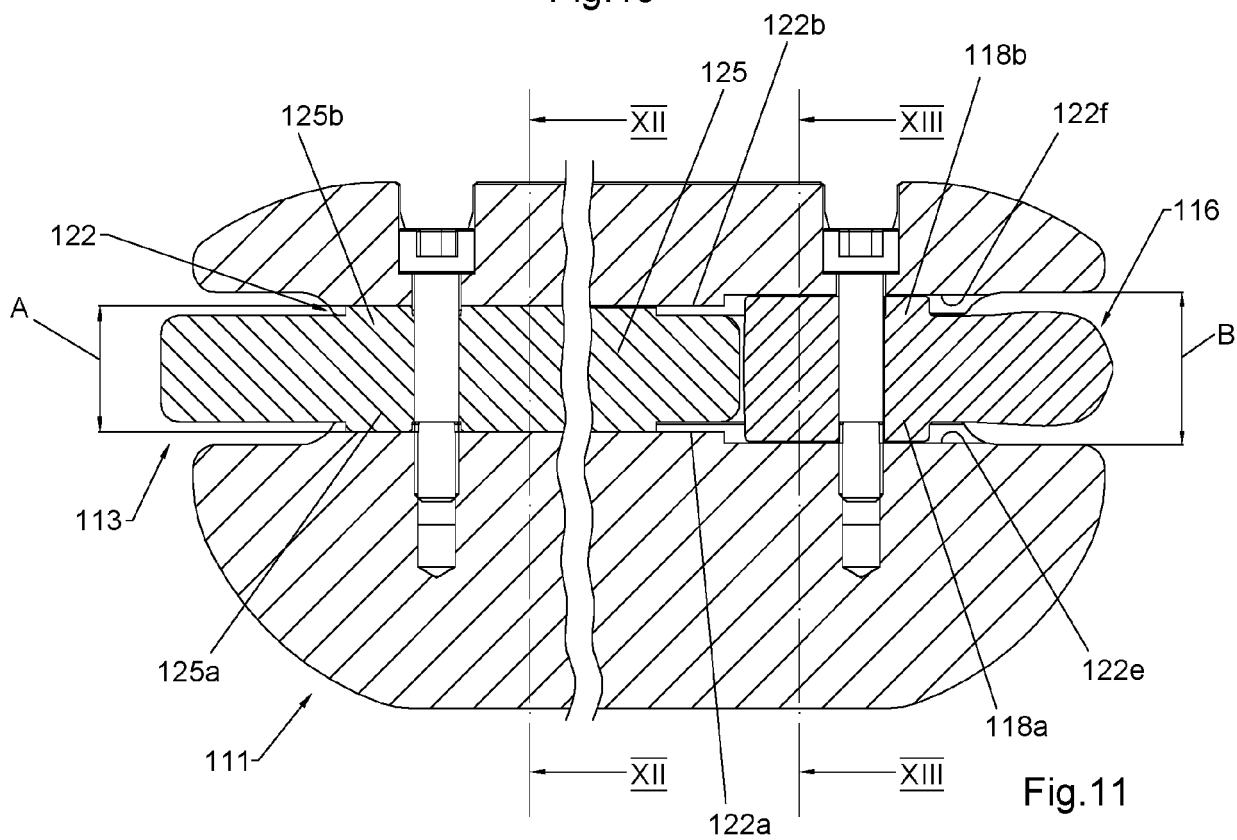


Fig.11

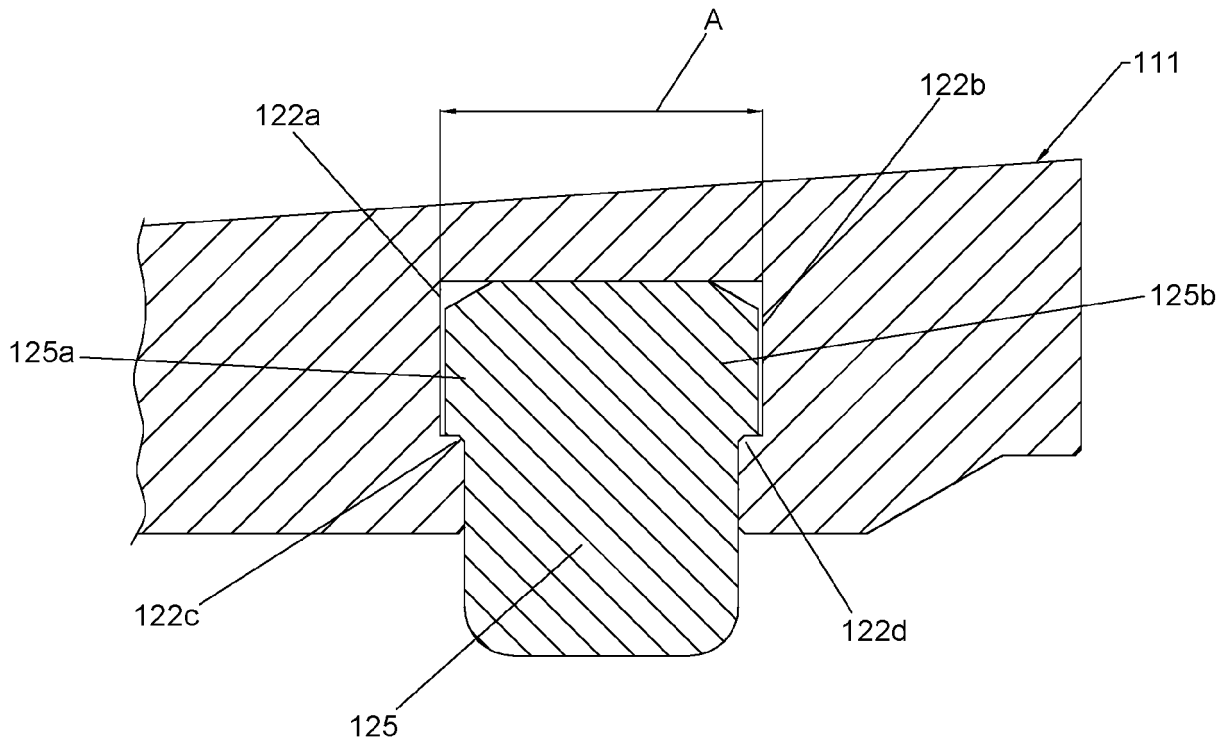


Fig.12

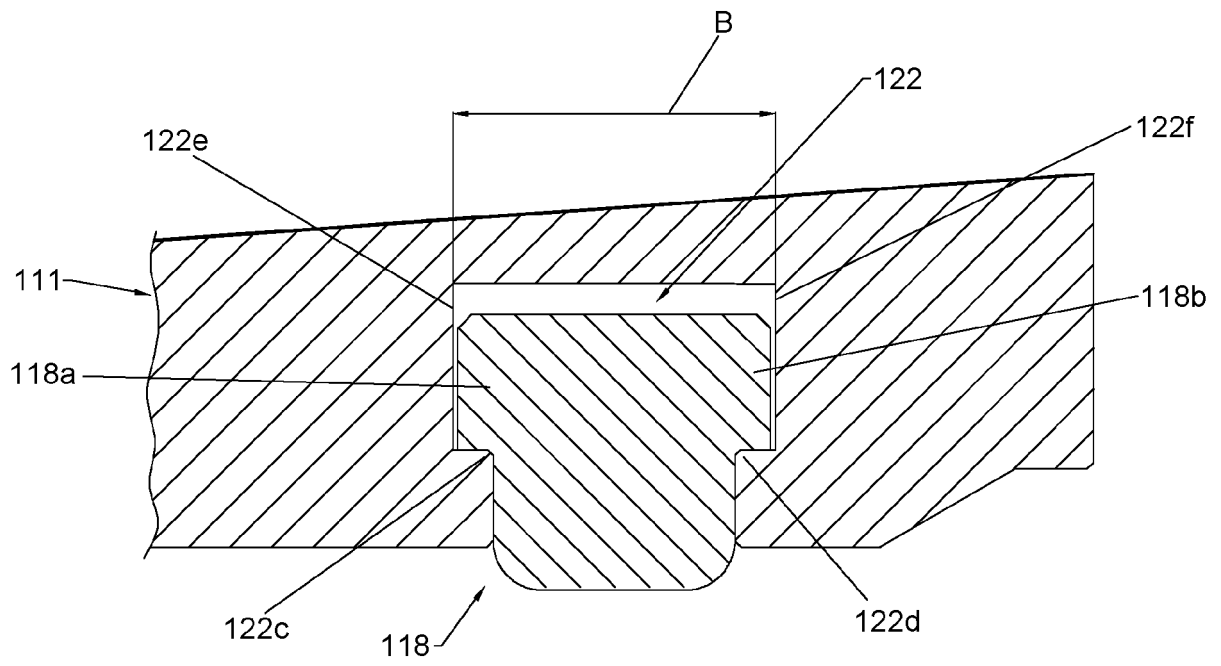


Fig.13



EUROPEAN SEARCH REPORT

Application Number
EP 20 19 2866

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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)
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