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(54) **Inner liner of a helmet, process to customize such an inner liner and helmet including such an inner liner**

Innenausstattung eines Helms, Verfahren für die Einstellung einer solchen Innenausstattung und Helm mit einer solchen Innenausstattung

Habillage intérieur d'un casque, procédé de personalisation d'un tel habillage intérieur et casque comprenant un tel habillage intérieur

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(56) References cited:
JP-A- 2000 154 417
JP-A- 2003 301 316
JP-U- H0 654 735
JP-U- 63 089 926
US-A- 3 465 363
US-A- 4 345 338

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Description

[0001] The present disclosure relates generally to the technical field of protective helmets. More particularly, the present disclosure relates to a inner liner, conventionally also referred to as "interior", for a protection helmet, which is located inside an external cap of a helmet, and intended to be interposed between the cap and a user's head. In particular, within the scope of the present description and in the claims hereinafter, by the term "inner liner" of a helmet it is meant a generally soft assembly which is for covering, at least partially, an internal or concave side of the cap (wherein said rigid cap includes a shell and a polystyrene layer) and acting as soft layer or comfort layer between the cap and the head. Such inner liner can also comprise cheekbone guards.

[0002] More particularly, in the field of protective helmets, it is known that the external cap, conventionally made up of a shell and a polystyrene layer, has a substantially spherical shape, with a variable internal circumference depending on the head size or dimension. The liner has a predefined height depending on the internal circumference of the cap, and is such as to fill a gap between the internal circumference of the cap and the circumference of a user's head. Ultimately, the inner liner has a height depending on the difference of the average dimensions of head circumference and internal diameter of the cap, to fill the space between the rigid external cap and the head.

[0003] Such an inner liner, though advantageous under several standpoints, entails some drawbacks.

[0004] A drawback is, e.g., that with a known inner liner it is not always possible to provide an optimal comfort and at the same time stability to the helmet.

[0005] In fact, considering the variability in the anatomy of a user's head, it is not always possible to have a helmet in which the interior of the helmet can perfectly fill the gap between the cap and the head.

[0006] In an attempt to overcome such a drawback, sometimes one has to choose a helmet of a smaller size in order to guarantee helmet stability to the detriment of comfort.

[0007] Sometimes instead, to have greater comfort and a less tight helmet, one has to choose a helmet of a larger size. In this case, however, in spite of the use of any strap or chin-strap the inner liner does not perfectly adhere to the head and therefore the helmet is not perfectly stationary when worn on. Ultimately, there is the risk of a scarce stability of the helmet when it is worn on.

[0008] Document JP 2003 301316 A discloses a helmet with an insert attaching an inner liner to the helmet cap.

[0009] The technical problem at the basis of the present disclosure lies in providing an inner liner of a helmet and a helmet including such liner allowing to overcome at least one of the drawbacks mentioned hereto and/or providing some advantages. Such a technical problem is solved by an inner liner for helmets as defined in the independent claim 1 and by a helmet according to claim 11.

[0010] The present invention also relates to a method for customizing an inner liner for helmets, as defined in claim 15.

[0011] Secondary features of the subject of the present disclosure are defined in the corresponding dependent claims thereof.

[0012] Thanks to the use of one or more support inserts, which are located in a zone of the cap (or, more precisely, of the internal layer of the cap, e.g. the polystyrene one) resting on a user's head, during use of a helmet, a supporting of the cap by the inner liner may be obtained, actually freeing the cap dimension and the head dimension from a strict correlation.

[0013] In practice, it is the liner which has support points for the cap, so that a user "feels" in a relatively reduced way the cap resting on the head. In fact, thanks to the inserts, the feeling of resting is damped by the inner liner. In still other words, the inserts act as spacers between the cap and a user's head.

[0014] The inner liner according to the present disclosure can therefore give a high stability to the helmet, as the cap is mainly supported by the inner liner, without risk of the cap moving during use, as well as a satisfactory comfort. Comfort is guaranteed by the fact that the one or more inserts can be distributed, according to the head anatomy, and occupy defined zones of the inner liner. Moreover, in one embodiment, to foster comfort the inserts are made of a soft and compressible material, so as to be an integral part of the pad. For instance, it is a material having a flexible cell structure, such as a sponge.

[0015] Moreover, the soft and compressible material allows easy inserting of the inserts by a user thanks to the fact that, at the time of inserting, the insert may be slightly flattened. In order to foster compression, in some embodiments, the insert has an internal pass-through hole.

[0016] Moreover, it is noted that the compressible and flexible structure of the support inserts is compatible with a textile-type production of the interior of the helmet, e.g. by under-the-press thermoforming. In other words, it is observed that the fact of using a soft material allows to insert the inserts into the holes already at the time of manufacturing the interior of a helmet, and optionally to subject them to compression during the manufacturing of the interior of a helmet.

[0017] Moreover, the inner liner according to the present disclosure can allow to use, for a given range of sizes, a single cap of standard dimension and vary the inner liner, customizing the inner liner on the basis of the size, or of a specific configuration of a user's head. In this regard, it could suffice to vary the position or the height of the support inserts.

[0018] In this regard, it has to be noted that the inserts are structurally independent and individually manipulable members, and they can be inserted into the respective holes according to the needs.

[0019] It is therefore possible to customize an inner liner of a helmet starting from a customized mapping of a user's head in order to locate specific zones of the cap resting on the head. Then, one or more support or resting inserts are associated to the pad in the regions of the located resting zones.

[0020] Other features and the modes of use of the subject of the present disclosure will become clear from the following detailed description of some preferred embodiments thereof, provided by way of a non-limiting example. It is clear, however, that each embodiment may have one or more of the advantages listed above; in any case it is not required that each embodiment should have simultaneously all the advantages listed.

[0021] It is also to be understood that all possible combinations of the above-indicated embodiments, and of those described with reference to the following detailed description, fall within the scope of the present disclosure, which is only limited by the appended claims.

[0022] Reference will be made to the figures of the annexed drawings, wherein:

- Figure 1 shows an at least partially sectional side view of a helmet including an inner liner according to the present disclosure;
- Figure 2 shows a side view of an inner liner for a helmet according to the present disclosure in a worn-on condition;
- Figure 3 shows a rear view of an inner liner for a helmet according to the present disclosure in a worn-on condition;
- Figure 4 shows a sectional view along line IV-IV of Figure 2;
- Figure 5 shows a sectional view along line V-V of Figure 2;
- Figure 6 shows a sectional view of a portion of inner liner according to a variant embodiment;
- Figure 7 shows a view with detached parts of a portion of inner liner for a helmet;
- Figure 8 shows a view with detached parts of a portion of inner liner for a helmet during a processing step.

[0023] Referring to the attached figures, by reference number 10 it is denoted an inner liner, also referred to as "interior", for a helmet 12 according to the present disclosure. The helmet 12 includes a rigid external cap 14, which includes a polystyrene layer 15 and a shell 17 of reduced thickness with respect to the polystyrene layer 15.

[0024] The inner liner 10 is adapted to be interposed between a user's head T and the cap 14. Therefore, such inner liner 10 is a generally soft structure, hence intended to be bent to adhere to the shape of a user's head T. The inner liner 10 is fixed to the cap 14, e.g., by Velcro®, snap fasteners or alike removable fixing means. More particularly, in the example illustrated the inner liner 10 includes a pad 24 made of a soft and spongy material that partially lines the cap 14 and has open zones or cavities 26, allowing to keep the overall weight of the helmet 12 as reduced as possible, as well as facilitating aeration inside the helmet 12, or allowing ear accommodation.

[0025] In the example illustrated, the pad 24 includes appendages 27 which extend to the region of each cheekbone and mandible of a user, to form so-called cheekbone guards.

[0026] According to an aspect of the present disclosure, the inner liner 10 comprises one or more support inserts 25 inserted into corresponding holes 33, in the example pass-through holes, obtained in the pad 24.

[0027] The support inserts 25 have a supporting or resting function, i.e. are able to support the cap 14 in the region of defined zones of the cap 14, or more precisely of the polystyrene layer 15, resting on the head T.

[0028] In other words, the inner liner 10 includes a pad 24 made of spongy material and support inserts 25, said inserts also made of spongy and hand-compressible material, preferably having a compressive strength greater than the material of which the pad 24 is made, so as to act as support for the cap 14 of the helmet 12. The support inserts 25 may have a thickness alike to or different from the pad 24, depending on the zone of the helmet 12.

[0029] The presence of the support inserts 25, which, as mentioned, support the cap 14, gives an improved stability to the helmet 12. In fact, the position of the support inserts 25 can be selected on the basis of a shape of the user's head T (for example on the basis of the dimensions or peculiar anatomical features), actually freeing from a direct or strict correlation the dimensioning of the cap 14 and a user's dimension or head.

[0030] From another standpoint, the support inserts 25 act as spacers so that the cap 14 keeps at a certain distance from the head T.

[0031] In the solution illustrated in the drawings, the support inserts 25 are made of a flexible cell structure, such as, e.g., foam.

[0032] In other embodiments, the support inserts 25 are made of gel, polyurethane or polystyrene.

[0033] In the embodiment described, four support inserts 25 are provided, located in the region of as many (four) points on the top of a user's head T, in particular two aligned in a top front zone (Figure 2) and two aligned in the top rear zone (Figure 3).

[0034] In other words, the position of such support inserts 25 is not random but accurately selected after having performed a mapping of a user's cranium, and having singled out on which points a cap 14 rests when it is worn on by user. Such points mainly vary depending on the dimension and size of the head T.

[0035] Referring to Figure 5, in one embodiment, the support insert 25 has a cylindrical shape and is provided with internal pass-through holes 28 parallel to the cylinder axis. Even more particularly, the support insert 25 has a first surface 25a adapted to be facing the cap 14 and a second surface 25b adapted to be facing the user's head T, and the pass-through hole 28 extends between said

first surface 25a and said second surface 25b.

[0036] In the embodiment described, the inner liner 10 is moreover a textile sandwich structure including a first lining 20, or external leather, a second lining 22, or internal leather, and the pad 24 of spongy material, included between the first lining 20 and the second lining 22. The pad 24 forms an inner core or kernel for the sandwich structure.

[0037] The first lining 20 and the second lining 22 are perimetrically connected in the region of respective edges projecting with respect to the core or pad 24, optionally by an edge ribbon, to keep the pad 24 stationary.

[0038] The first lining 20 and the second lining 22 are made of a so-called comfort fabric, e.g. of microfiber or of Lycra.

[0039] The pad 24 comprises at least two different layers of soft material.

[0040] Such a difference can consist, e.g., in a difference of thickness or height, and/or of material. I.e., the pad 24 has two overlapped layers which are different from each other in thickness or height, and/or in material.

[0041] In the embodiment example the pad comprises a first layer 124 facing the user's head T and a second layer 224 facing the cap 14. The support inserts 25 are inserted passing through both the at least two layers 124, 224.

[0042] The first layer 124 is made of a material having a compressive strength smaller than the material of which the second layer 224 is made. Thus, there is a more rigid layer facing the cap 14 which is better able to bear the weight of the cap 14, and a softer layer facing the user which is more suitable for contact with the head T.

[0043] E.g., the two layers may be made of foam, gel, polyurethane or polystyrene.

[0044] Referring to Figure 8, the inner liner 10 is manufactured according to the following process.

[0045] The first lining 20 and the second lining 22 are provided, cut in a pattern according to the profile of inner liner 10 to be obtained.

[0046] Between the first lining 20 and 22, the layers 124, 224 of the various materials forming the pad 24 are inserted. The layers 124, 224 and the first lining 20 are provided with respective holes 33 for the housing of the support inserts 25. Moreover, the first lining 20 and the second lining 22 are provided on the inner side with a film of glue, schematically drawn and denoted by reference number 120 in figure 8, and are placed under a press 60 to facilitate adhesion and mutual gluing. Thus, the pad 24 formed by the various layers and materials described is immobilized between the first lining 20 and the second lining 22.

[0047] The first lining 20 and the second lining 22 have a surface extension greater than the pad 24. In practice, such perimetrical portions of the first lining 20 and of the second lining 22 are stably connected with each other, e.g. by glue or adhesive, along the entire perimetrical edge so as to contain the pad 24.

[0048] The first lining 20 and the layers 124 and 224 are moreover provided with holes 33 for the housing of the support inserts 25.

[0049] Optionally, the edge is subsequently trimmed and an edge ribbon is added.

[0050] This process for manufacturing the inner liner 10 allows to modify the materials and the layers of the pad 24 according to the needs, like e.g. according to the type of a protective helmet, e.g. motorcycle helmet, bicycle helmet, ski helmet, climbing helmet or other helmets, as well as to vary at will the design of the inner liner. According to an aspect of the present disclosure, it is moreover noted that, thanks to the use of the support inserts 25, 125, permanently inserted in the holes during use of the helmet and acting, as mentioned, as spacers between the cap 14 and a user's head T, an inner liner 10 can be manufactured which, besides giving stability to the cap 14, allows to use a cap 14 not strictly correlated to the head size or shape.

[0051] Thus, it is possible to use a cap of a common standard dimension for plural near sizes of a helmet 12, and vary only the inner liner 10, in a customized manner.

[0052] In practice, the position of the support inserts 25, 125 can be selected in a customized manner, and moreover, depending on the shape and size of a user's head, the inner liner 10 can be adapted by modifying the number of layers making up the pad 24, or the material of which the pad 24 is made.

[0053] In other words, by suitably selecting the position of the support inserts 25, 125, 125, which constitute resting points for the cap 14, and preferably varying the stratification and a distribution of the materials of the pad 24 according to head zones, it is possible to obtain an assortment of liners 10 different and customized with a single cap 14.

[0054] Therefore, it is possible to obtain an adjustment of the size of a helmet and a greater comfort, thanks to the fact that the position of the inserts and of the pad layers are selected depending on the shape and dimensions of a user's head.

[0055] The subject of the present disclosure has hereto been described with reference to preferred embodiments thereof. It is understood that there may be other embodiments referable to the same inventive concept, all falling within the protective scope of the claims set forth hereinafter.

Claims

1. An inner liner (10) of a helmet (12), said inner liner (10) being adapted to be interposed between a user's head (T) and a cap (14) of the helmet (12) and acting as soft layer or comfort layer between the cap and the head, said cap (14) including at least one internal polystyrene layer (15) and an external shell (17), said inner liner (10) including a pad (24) and a plurality of support inserts (25) associated to said pad (24) and suitable for acting as support for the

internal polystyrene layer (15) of the cap (14), wherein said support inserts (25) are located into corresponding pass-through holes (33, 133) made in said pad (24, 124), and wherein the support inserts (25) act as spacers between the cap and a user's head and damp a feeling of resting of the cap (14) on the user's head.

2. The inner liner (10) according to claim 1, wherein said support insert (25) has at least one pass-through hole (28).

3. The inner liner (10) according to claim 2, wherein said support insert (25) has a first surface adapted to be facing the cap (14) and a second surface adapted to be facing the user's head (T), and wherein said at least one pass-through hole (28) extends between said first surface (25a) and said second surface (25b).

4. The inner liner (10) according to any one of the preceding claims, wherein the support insert (25) is made of a material having a flexible cell structure and is of comfort for the user's head (T).

5. The inner liner (10) according to any one of the preceding claims, wherein each support insert (25) is a body individually manipulable and structurally independent from the pad (24) and is made of a hand-compressible material having a compressive strength greater than a compressive strength of said pad (24).

6. The inner liner (10) according to any one of the preceding claims, having a textile structure with a sandwich configuration and including a first lining (20) and a second lining (22), wherein said pad (24) is included between the first lining (20) and the second lining (22).

7. The inner liner (10) according to claim 6, wherein said support insert (25) is inserted in the pass-through hole (33) in said first lining (20) and in the pad (24).

8. The inner liner (10) according to any one of the preceding claims, wherein said pad (24) includes at least two overlapped layers (124, 224) and said support insert (25) is inserted in both said at least two layers (124, 224).

9. The inner liner (10) according to any one of the preceding claims, wherein said pad (24) has weight-lightening cavities or openings (26).

10. The inner liner (10) according to any one of the preceding claims, comprising a plurality of support inserts (25) distributed in said pad (24) on the top of a user's head (T), wherein two inserts are aligned in a top front zone and two inserts are aligned in the top rear zone.

11. A helmet (12) including a cap (14) and an inner liner (10) according to any one of the preceding claims.

12. The helmet (12) according to claim 11, including an assortment of inner liners (10) according to any one of the preceding claims, said inner liners (10) being different from one another at least on the basis of a number, distribution, height and/or material of the support inserts (25).

13. The helmet (12) according to claim 11 or 12, wherein said internal layer (15) of the cap (14) is a layer of polystyrene.

14. The helmet (12) according to any one of the preceding claims 11 to 13, wherein the pad (24) is associated to the cap by removable fixing means.

15. A method for customizing an inner liner (10) for a protection helmet (12), wherein said inner liner (10) is adapted to be associated to a rigid cap (14) of the protection helmet (12) and acting as soft layer or comfort layer between the cap and the head, said cap (14) including an external shell (17) and an internal polystyrene layer (15), said method comprising the steps of

- performing a mapping of a user's head (T) to locate zones of the internal layer (15) of the cap (14) resting on the head (T);
- providing a pad (24) adapted to line at least partially the internal polystyrene layer (15),
- inserting a plurality of support inserts (25) into corresponding pass-through holes (33) made in said pad (24) and in the region of said zones of the layer (15) resting on the head (T), said support inserts (25) being adapted to act as support for the internal polystyrene layer (15) of the cap (14), to act as spacers between the cap (14) and the user's head and to damp a feeling of resting of the cap (14) on the user's head.

16. The method according to claim 15, wherein during a step of inserting into the respective pass-through holes (33) said one or more support inserts (25) are partially compressed in a longitudinal direction.

17. The method according to claim 15 or 16, wherein, without changing the cap (14), a first inner liner (10) is replaced with a second inner liner (10), said second inner liner (10) being different from the first inner liner (10) at least on the basis of a number, distribution, height and/or material of the support inserts (25).

Patentansprüche

1. Ein Innenfutter (10) eines Helmes (12), wobei das Innenfutter (10) dazu angepasst ist, zwischen dem Kopf eines Benutzers (T) und einer Kappe (14) des Helmes (12) angeordnet zu sein, und das als weiche Schicht oder Komfortschicht zwischen der Kappe und dem Kopf wirkt, wobei die Kappe (14) mindestens eine innere Polystyrolschicht (15) und eine Außenschale (17) umfasst, wobei das Innenfutter (10) umfasst: Ein Polster (24) und eine Mehrzahl von Stützeinsätzen (25), die dem Polster (24) zugeordnet sind und die geeignet sind, als Stütze für die innere Polystyrolschicht (15) der Kappe (14) zu wirken, wobei die Stützeinsätze (25) in entsprechenden, in dem Polster (24, 124) erzeugten Durchgangslöchern (33, 133) situiert sind, und wobei die Stützeinsätze (25) als Abstandhalter zwischen der Kappe und einem Benutzerkopf wirken und ein Gefühl des Ruhens der Kappe (14) auf dem Benutzerkopf dämpfen.

2. Das Innenfutter (10) gemäß Anspruch 1, wobei der Stützeinsatz (25) zumindest ein Durchgangsloch (28) aufweist.

3. Das Innenfutter (10) gemäß Anspruch 2, wobei der Stützeinsatz (25) eine erste Oberfläche aufweist, die angepasst ist, um der Kappe (14) zugewandt zu sein, und eine zweite Oberfläche, die angepasst ist, um dem Benutzerkopf (T) zugewandt zu sein, und wobei das zumindest eine Durchgangsloch (28) sich zwischen der ersten Oberfläche (25a) und der zweiten Oberfläche (25b) erstreckt.

4. Das Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, wobei der Stützeinsatz (25) aus einem Material hergestellt ist, welches eine flexible Zellenstruktur aufweist und komfortabel für den Kopf des Benutzers (T) ist.

5. Die Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, wobei jeder Stützeinsatz (25) ein Körper ist, der einzeln manipulierbar und strukturell unabhängig von dem Polster (24) ist und aus einem von Hand zusammendrückbaren Material hergestellt ist, das eine Druckfestigkeit aufweist, die größer als die Druckfestigkeit des Polsters (24) ist.

6. Das Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, das eine Textil-struktur mit einer Sandwich-Konfiguration aufweist und ein erstes Futter (20) und ein zweites Futter (22) umfasst, wobei das Polster (24) zwischen dem ersten Futter (20) und dem zweiten Futter (22) eingefasst ist.

7. Das Innenfutter (10) gemäß Anspruch 6, wobei der Stützeinsatz (25) in dem Durchgangsloch (33) in dem ersten Futter (20) und in dem Polster (24) eingefügt ist.

8. Das Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, wobei das Polster (24) zumindest zwei überlappende Schichten (124, 224) umfasst und der Stützeinsatz (25) in beide der zumindest zwei überlappenden Schichten (124, 224) eingesetzt ist.

9. Das Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, wobei das Polster (24) gewichtsvermindernde Hohlräume oder Öffnungen (26) aufweist.

10. Das Innenfutter (10) gemäß einem der vorhergehenden Ansprüche, umfassend eine Vielzahl von Stützeinlagen (25), die in dem Polster (24) auf dem oberen Teil eines Benutzerkopfes (T) verteilt sind, wobei zwei Einsätze im vorderen Bereich des oberen Teils ausgerichtet sind und zwei Einsätze im hinteren Bereich des oberen Teils ausgerichtet sind.

11. Ein Helm (12) aufweisend eine Kappe (14) und einer Innenfutter (10) gemäß einem der vorhergehenden Ansprüche.

12. Der Helm (12) gemäß Anspruch 11, einschließlich einer Auswahl von Innenfuttern (10) nach einem der vorhergehenden Ansprüche, wobei die Innenfutter (10) sich zumindest aufgrund einer Zahl, der Verteilung, der Höhe und / oder des Materials der Stützeinsätze (25) voneinander unterscheiden.

13. Der Helm (12) gemäß Anspruch 11 oder 12, wobei die innere Schicht (15) der Kappe (14) eine Schicht aus Polystyrol ist.

14. Der Helm (12) gemäß einem der vorhergehenden Ansprüche 11 bis 13, wobei das Polster (24) mittels abnehmbarer Befestigungsmittel mit der Kappe verbunden ist.

15. Verfahren zur Anpassung eines Innenfutters (10) für einen Schutzhelm (12), bei dem das Innenfutter (10) dazu angepasst ist, mit einer starren Kappe (14) des Schutzhelmes (12) verbunden zu werden und als weiche Schicht oder Komfortschicht zwischen der Kappe und dem Kopf zu wirken, wobei die Kappe (14) eine äußere Schale (17) und eine innere Polystyrolschicht (15) umfasst, wobei das Verfahren folgende Schritte umfasst:

    - Erstellen einer Abbildung eines Benutzerkopfes (T) um Bereiche der inneren Schicht (15) der Kappe (14), die auf dem Kopf (T) aufliegen, zu lokalisieren;
    - Bereitstellen eines Polsters (24), das dazu ge-

eignet ist, zumindest teilweise die innere Polystyrolschicht (15) auszulegen,
- Einsetzen mehrerer Stützeinsätze (25) in entsprechende Durchgangslöcher (33), die in dem Polster (24) und in dem Bereich der Bereiche der Schicht (15) erstellt sind, die auf dem Kopf (T) aufliegen, wobei die Stützeinsatze (25) dazu angepasst sind, als Stütze für die innere Polystyrolschicht (15) der Kappe (14) zu wirken, um als Abstandhalter zwischen der Kappe (14) und dem Benutzerkopf zu agieren und um ein Gefühl des Aufliegens der Kappe (14) auf dem Benutzerkopf zu dämpfen.

16. Das Verfahren gemäß Anspruch 15, bei dem während eines Schrittes des Einsetzens in die jeweiligen Durchgangslöcher (33) der oder die Stützeinsätze (25) in einer Längsrichtung teilweise komprimiert werden.

17. Verfahren gemäß Anspruch 15 oder 16, wobei, ohne die Kappe (14) zu ändern, ein erstes Innenfutter (10) durch ein zweites Innenfutter (10) ersetzt wird, wobei das zweite Innenfutter (10) zumindest aufgrund einer Zahl, der Verteilung, der Höhe und / oder des Materials der Stützeinsätze (25) von dem ersten Innenfutter (10) verschieden ist.

Revendications

1. Revêtement interne (10) d'un casque (12), ledit revêtement interne (10) étant adapté pour être intercalé entre la tête (T) d'un utilisateur et une calotte (14) du casque (12) et servant de couche souple ou de couche de confort entre la calotte et la tête, ladite calotte (14) comprenant au moins une couche de polystyrène interne (15) et une coque externe (17), ledit revêtement interne (10) comprenant un coussinet (24) et une pluralité d'inserts de support (25) associés audit coussinet (24) et appropriés pour servir de support pour la couche de polystyrène interne (15) de la calotte (14), dans lequel lesdits inserts de support (25) sont positionnés dans des trous traversants (33, 133) correspondants réalisés dans ledit coussinet (24, 124) et dans lequel les inserts de support (25) servent de dispositifs d'espacement entre la calotte et la tête d'un utilisateur et amortissent une sensation d'appui de la calotte (14) sur la tête de l'utilisateur.

2. Revêtement interne (10) selon la revendication 1, dans lequel ledit insert de support (25) a au moins un trou traversant (28).

3. Revêtement interne (10) selon la revendication 2, dans lequel ledit insert de support (25) a une première surface adaptée pour faire face à la calotte (14) et une seconde surface adaptée pour faire face à la tête (T) de l'utilisateur, et dans lequel ledit au moins un trou traversant (28) s'étend entre ladite première surface (25a) et ladite seconde surface (25b).

4. Revêtement interne (10) selon l'une quelconque des revendications précédentes, dans lequel l'insert de support (25) est réalisé avec un matériau ayant une structure alvéolaire souple et est confortable pour la tête (T) de l'utilisateur.

5. Revêtement interne (10) selon l'une quelconque des revendications précédentes, dans lequel chaque insert de support (25) est un corps individuellement manipulable et structurellement indépendant du coussinet (24) et est réalisé avec un matériau compressible à la main ayant une résistance à la compression supérieure à une résistance à la compression dudit coussinet (24).

6. Revêtement interne (10) selon l'une quelconque des revendications précédentes, ayant une structure textile avec une configuration en sandwich et comprenant une première doublure (20) et une seconde doublure (22), dans lequel ledit coussinet (24) est inclus entre la première doublure (20) et la seconde doublure (22).

7. Revêtement interne (10) selon la revendication 6, dans lequel ledit insert de support (25) est inséré dans le trou traversant (33) dans ladite première doublure (20) et dans le coussinet (24).

8. Revêtement interne (10) selon l'une quelconque des revendications précédentes, dans lequel ledit coussinet (24) comprend au moins deux couches chevauchées (124, 224) et ledit insert de support (25) est inséré à la fois dans lesdites au moins deux couches (124, 224).

9. Revêtement interne (10) selon l'une quelconque des revendications précédentes, dans lequel ledit coussinet (24) a des cavités ou des ouvertures (26) d'allègement.

10. Revêtement interne (10) selon l'une quelconque des revendications précédentes, comprenant une pluralité d'inserts de support (25) répartis dans ledit coussinet (24) sur la partie supérieure de la tête (T) d'un utilisateur, dans lequel deux inserts sont alignés dans une zone avant supérieure et deux inserts sont alignés dans la zone arrière supérieure.

11. Casque (12) comprenant une calotte (14) et un revêtement interne (10) selon l'une quelconque des revendications précédentes.

12. Casque (12) selon la revendication 11, comprenant

un assortiment de revêtements internes (10) selon l'une quelconque des revendications précédentes, lesdits revêtements internes (10) étant différents les uns des autres au moins sur la base du nombre, de la répartition, de la hauteur et/ou du matériau des inserts de support (25).

13. Casque (12) selon la revendication 11 ou 12, dans lequel ladite couche interne (15) de la calotte (14) est une couche de polystyrène.

14. Casque (12) selon l'une quelconque des revendications 11 à 13, dans lequel le coussinet (24) est associé à la calotte par des moyens de fixation détachables.

15. Procédé pour personnaliser un revêtement interne (10) pour un casque de protection (12), dans lequel ledit revêtement interne (10) est adapté pour être associé à une calotte rigide (14) du casque de protection (12) et servant de couche souple ou de couche de confort entre la calotte et la tête, ladite calotte (14) comprenant une coque externe (17) et une couche de polystyrène interne (15), ledit procédé comprenant les étapes consistant à :

réaliser un dessin de la tête (T) de l'utilisateur pour localiser les zones de la couche interne (15) de la calotte (14) appuyant sur la tête (T) ;
prévoir un coussinet (24) adapté pour recouvrir au moins partiellement la couche de polystyrène interne (15) ;
insérer une pluralité d'inserts de support (25) dans des trous traversants (33) correspondants réalisés dans ledit coussinet (24) et dans la région desdites zones de la couche (15) s'appuyant sur la tête (T), lesdits inserts de support (25) étant adaptés pour servir de support pour la couche de polystyrène interne (15) de la calotte (14), afin de servir de dispositifs d'espacement entre la calotte (14) et la tête de l'utilisateur et pour amortir une sensation d'appui de la calotte (14) sur la tête de l'utilisateur.

16. Procédé selon la revendication 15, dans lequel pendant une étape d'insertion dans les trous traversants (33) respectifs, lesdits un ou plusieurs inserts de support (25) sont partiellement comprimés dans une direction longitudinale.

17. Procédé selon la revendication 15 ou 16, dans lequel, sans changer la calotte (14), une première revêtement interne (10) est remplacée par un second revêtement interne (10), ledit second revêtement interne (10) étant différent du premier revêtement interne (10) au moins sur la base d'un nombre, de la distribution, de la hauteur et/ou du matériau des inserts de support (25).

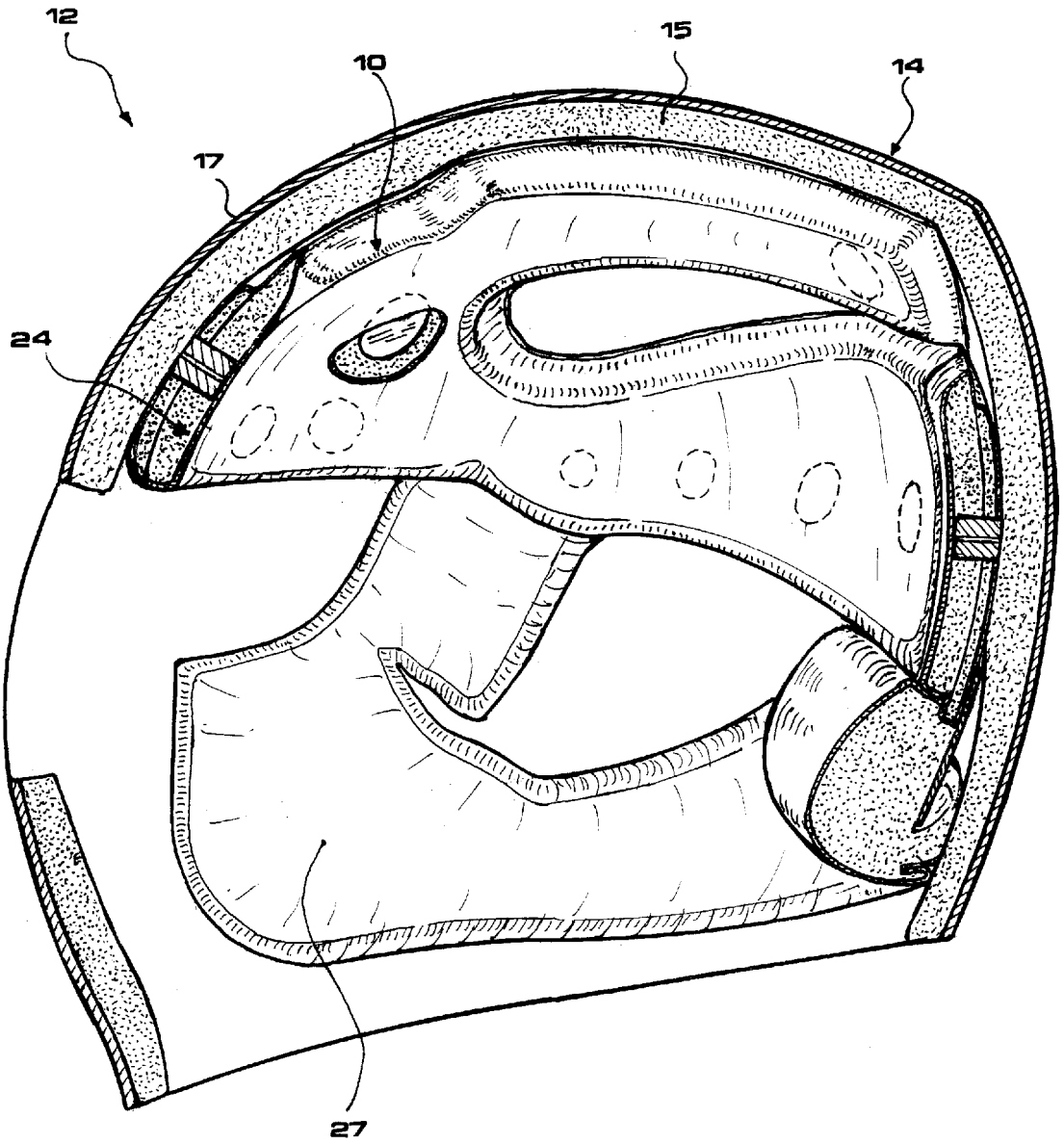


FIG.1

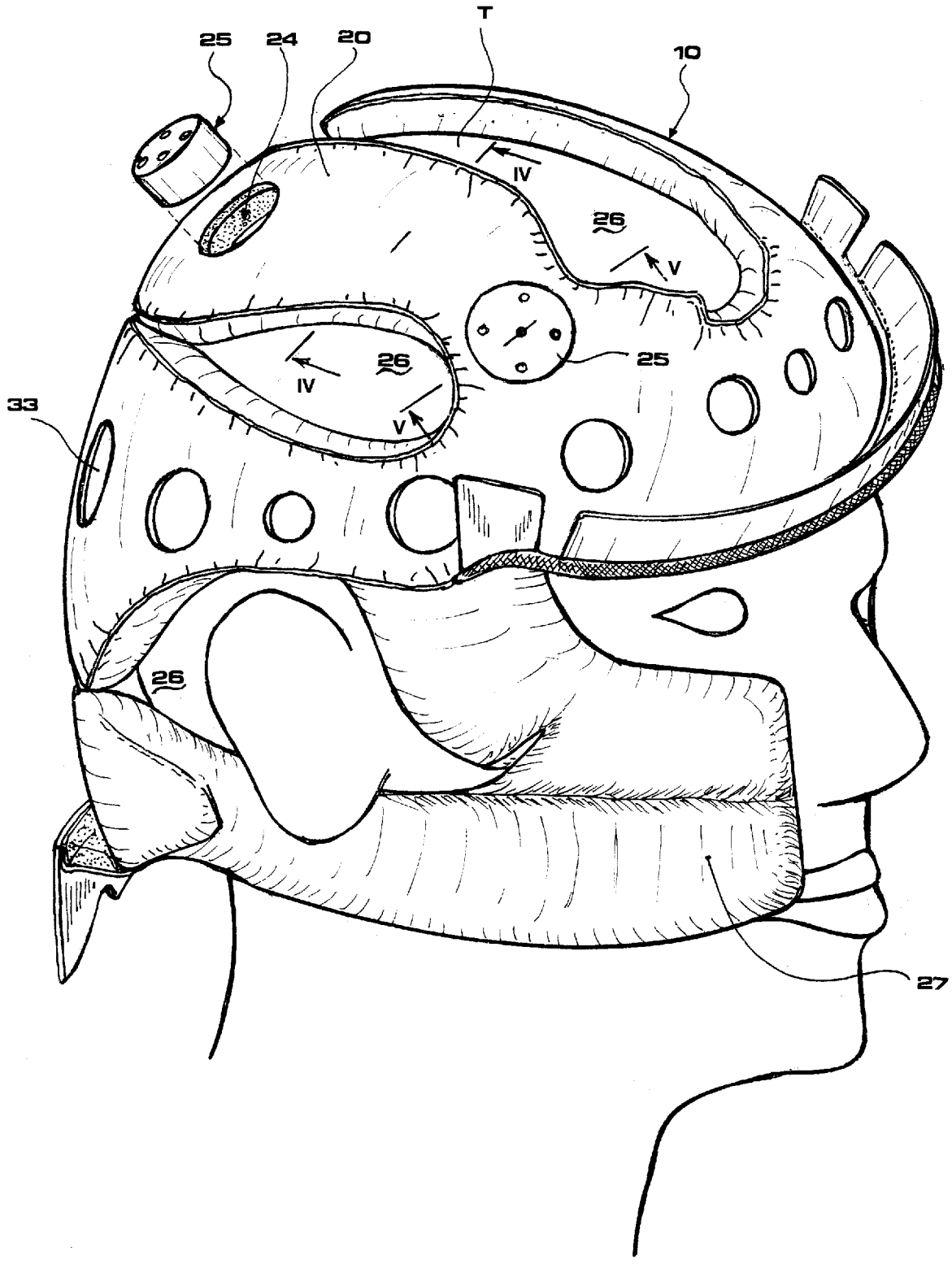


FIG.2

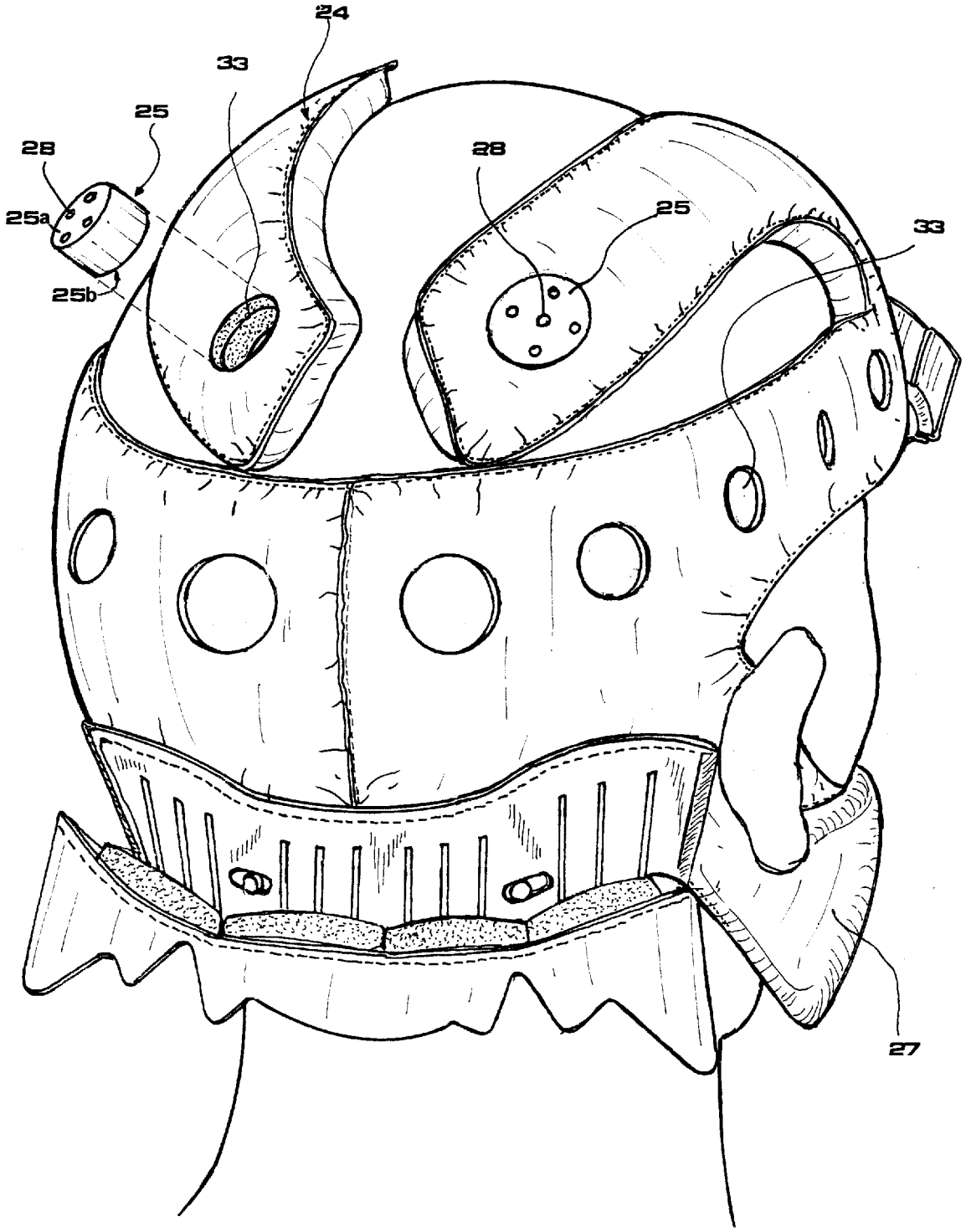


FIG.3

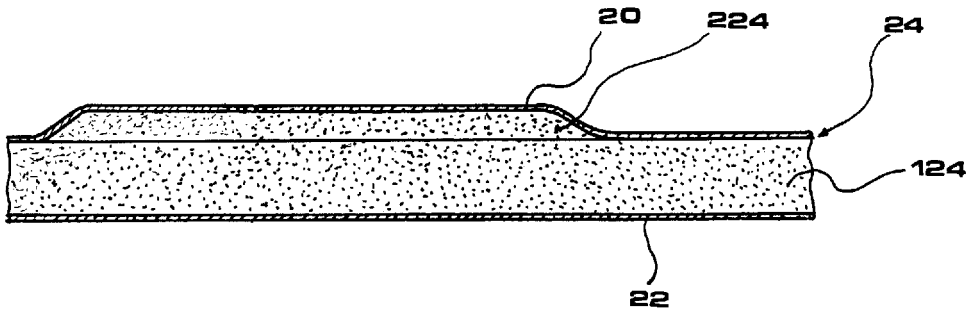


FIG.4

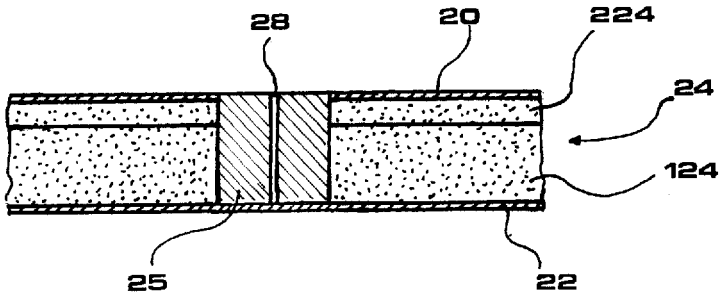


FIG.5

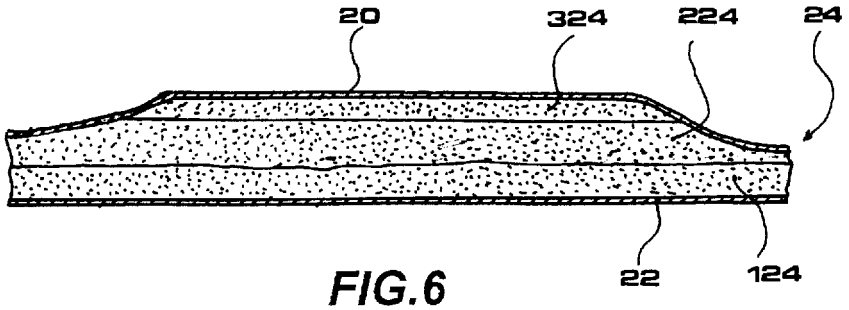


FIG.6

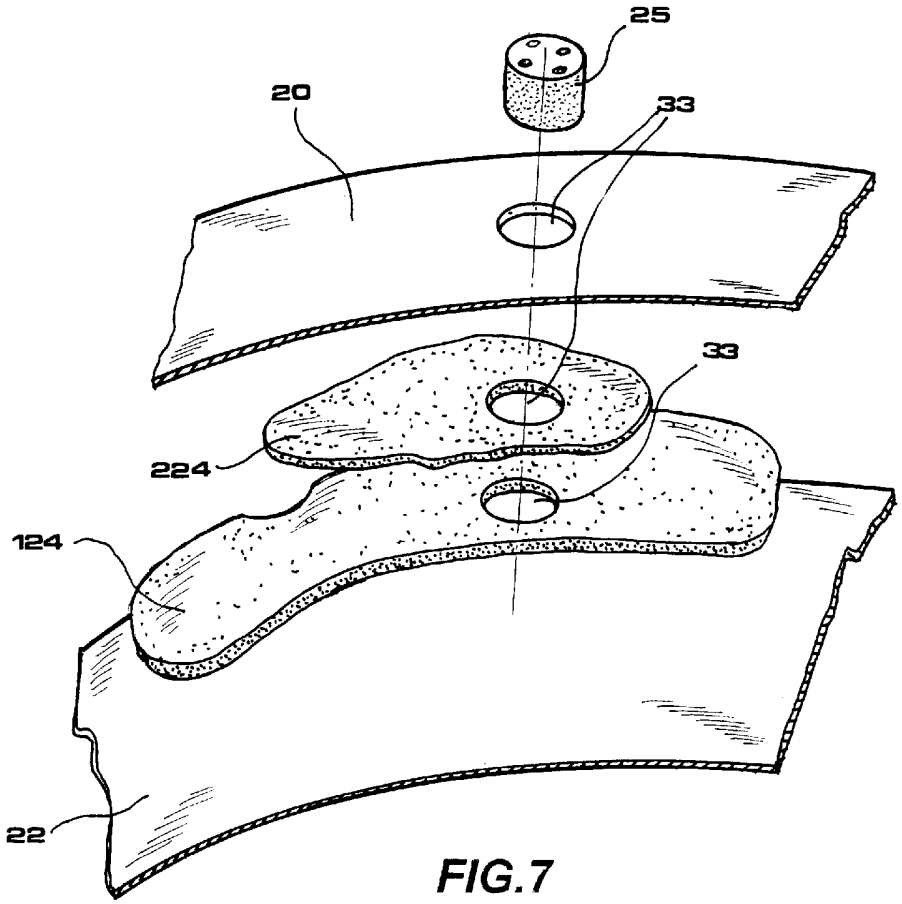


FIG.7

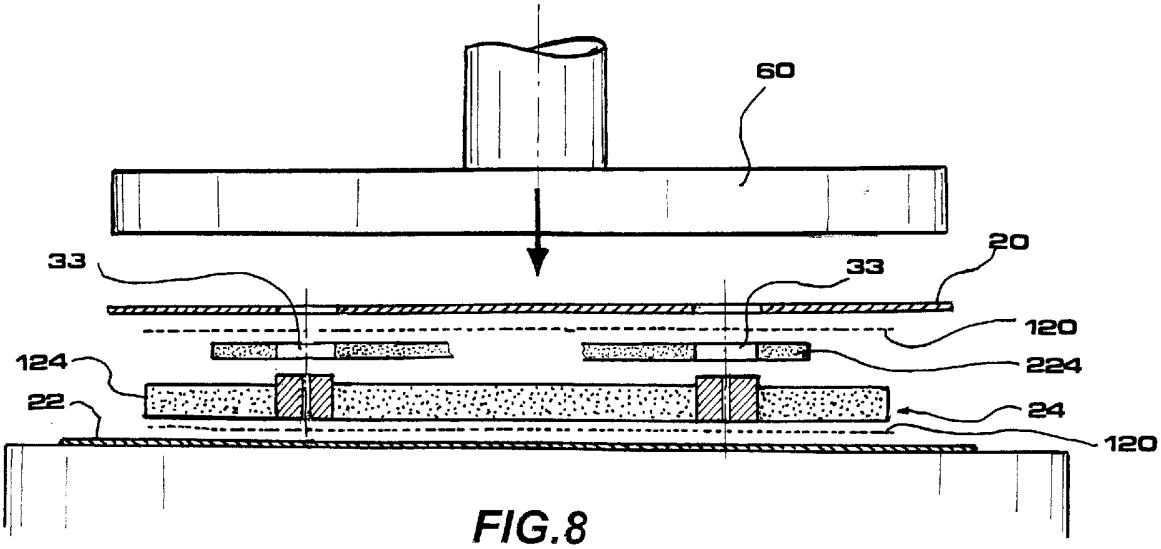


FIG.8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2003301316 A **[0008]**