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(54) Cephalic ring for controlling headache

(57) The invention concerns a cephalic ring 1, comprised of a not-extensible material, and provided with a plurality of semirigid block pairs 3, the position of which along the ring inner surface 2 can be adjusted, characterised in that temporal block pair 3B, provided on a downward projecting part, so as to be in front of tragus, compresses temporal arteries, and occipital level blocks 3C compresses occipital arteries; in the embodiment with front hemi-ring about forehead (thus extending horizontally), also a front block 3A pair is present, not exerting compression on forehead arteries.

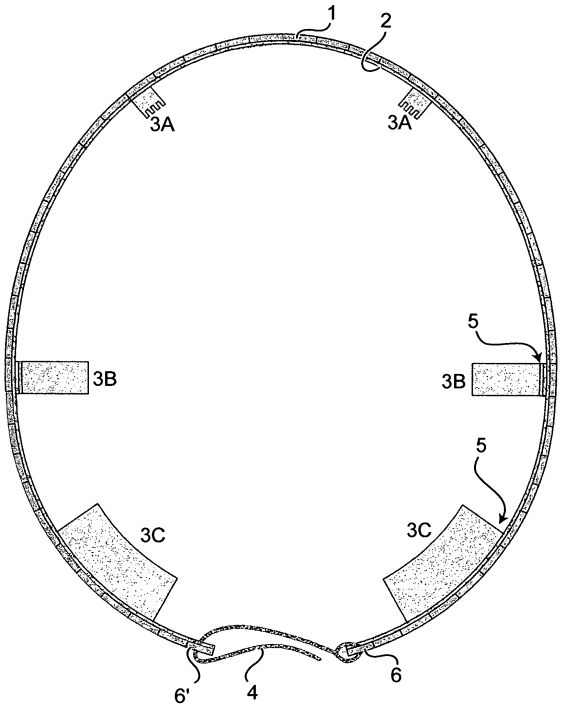

Fig. 1

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Description

[0001] The present invention relates to a cephalic ring for controlling headache.

[0002] Idiopathic headache (cephalea), i.e. not secondary headache to any other pathology, is very diffused among people.

[0003] Most diffused remedy is treatment by specific analgesic and anti-headache (triptane), which is surely efficient in most cases, but often associated with side effects.

[0004] Different means have been suggested for headache pain relief, permitting avoiding pharmacology therapy and its possible side effects.

[0005] U.S. patent n° 4,944,289 describes a band comprising a plurality of adjustable means, extending longitudinally, said means applying an even pressure on the preset cranium points, and that it is known that relief headache. Means for exerting pressure can also be provided on the frontal region and they can exert pressure at the sopraorbital artery level. No limitation is provided to the disposition of said means at the level of branches of temporal artery above the temporal muscle.

[0006] WO 01/93798 describes an apparatus compressing only temporal arteries, solution rarely making the cephalea episode ending.

[0007] U.S. patent n° 5,419,758 describes a method for headache relief comprising the use of an elastic band, permitting applying an even and continuous pressure by introduction of one or more rubber discs between band and cranium, on the basis of the more or less severe pain area. Localisation of rubber discs can have a higher pressure choosing the most dolente zones and not arteries. Also in this case, elastic apparatus makes a uniform pressure on the whole head, compressing all vessels.

[0008] Authors of the present invention have recently observed that, in order to alleviate pain caused by headache it produces the opposite effect evenly compressing all vessels; particularly, it is not recommended compression of sopraorbital and frontal-over-trochlear arteries (usually made using bands evenly distributing pressure).

[0009] In view of the previous remarks, authors of the present invention have realised a device able making a prolonged and uniform pressure on precise points of the head of the patient suffering of headache, so as to avoid compression on cranium points the stressing of which produces an opposite effect in order to control pain.

[0010] It is therefore specific object of the present invention a cephalic ring comprised of not-extensible material, providing a plurality of pairs of semirigid blocks, the position of which along the inner surface of the ring can be adjusted, characterised in that there are provided at least a pair of blocks at the front level and pairs of blocks at the temporal and/or occipital level, in that said blocks at the frontal level do not exert pressure on the sopraorbital and frontal-over-trochlear arteries, and in that blocks at the temporal level project from the lower part of the ring of at least 1 cm.

[0011] Thanks to the projection of some cm under the ring up to in front of tragus, compression made by the cephalic ring according to the invention occurs on the main trunk of the temporal artery, thus making more efficient reduction of blood flow. Analogously, using the ring according to the invention, at occipital level, compression occurs on the trunk of occipital arteries, thus some centimetres under the branches of the occipital arteries, that cannot be suitably compressed in order to alleviate headache. Furthermore, it is suitably avoided compression of sopraorbital and trochlear-over-trochlear arteries, that would induce the opposite effect in controlling pain, by small front blocks, not exerting any compression.

[0012] Further, it is suitably avoided compression of sopraorbital arteries, not convenient for controlling pain, by front blocks not exerting any compression.

[0013] Preferably, according to the invention, both occipital blocks and temporal blocks are present.

[0014] In a preferred embodiment of the ring according to the invention, frontal blocks are provided with an undulated resting surface, namely a vertical undulation, thus avoiding any possible compression on arteries that could block the flowing. Still more preferably, frontal blocks are between 2 and 5.

[0015] Still according to a preferred embodiment of the ring according to the invention, temporal blocks can be provided with a rigid support ledge, preferably comprised of metal or of an alloy, vertically placed all along the length of block. This support is particularly useful in the outer part of block projecting from block in order to exert a uniform pressure on the contact surface with patient cranium. Preferably, blocks at temporal level project from the lower part of the ring of 1 - 2 cm.

[0016] According to a further preferred embodiment of the cephalic ring according to the invention, said ring is further provided with a rear (occipital) of front closure device, preferably a Velcro® strip passing through the vertical slots of the ring ends.

[0017] In a particularly preferred embodiment of the ring according to the invention, it is comprised of two hemi-parts, a front vertical part and a rear vertical part; said front vertical part resting on the cranial vertex while its ends, provided with block suitable to compression and suitably straightened rest on the temporal arteries, in front of tragus of each ear; in the upper portion of said vertical part, i.e. in correspondence of the cranial vertex, a joint is provided permitting different fixing positions of the opening of the same, so as to conform it to the cranium dimension and to exert the required pressure on the temporal arteries; a block is further provided on the top, and eventually two blocks are provided laterally, in correspondence of the parietal bones (said blocks having a thickness that can be conformed to the cranium dimensions), keeping the upper part, preventing its sliding backward.

[0018] Particularly, said rear part can be comprised of two elastic rods, or it can provide a fixing and adjustment

belt.

[0019] In a further particularly preferred embodiment of the ring according to the invention, it is comprised of two hemi-parts, a rear part to be applied horizontally and in correspondence of the head rear portion, and a part extending downward, compression at the temporal arteries level being realised by two rods provided with block with suitable dimensions, compression at the occipital arteries level occurring by two occipital blocks.

[0020] According to a further aspect of the present invention, the ring is provided on its inner surface with a Velcro® lining, and blocks are provided on the outer surface with a Velcro® lining, in order to maintain their position along said ring inner surface.

[0021] In an alternative embodiment of the present invention, the ring is provided on its inner surface with a slot or track, said blocks being movable and fixable along said slot or track by a screw or a snap fitting.

[0022] According to a preferred embodiment of the present invention, inelastic material is chosen among metal, light alloy leather, tissue, and inflatable rubber material. Preferably, said metal or light alloy is an aluminium-based material. In case the cephalic ring according to the invention is comprised of rigid material, said ring can be provided with one or more joints so as to make it easier folding of the same, thus easing its transportation and storage. Analogously, it can be comprised of two or more parts, that can slide one above the other one or one inside the other one.

[0023] In a preferred embodiment of the present invention, the ring has a substantially elliptical shape, with a bigger diameter between 18 cm and 24 cm and a lower diameter between 16 cm and 20 cm, while height is between 0.5 cm and 2 cm (figure 2, lateral view).

[0024] According to a further embodiment of the present invention, said semirigid material blocks, i.e, comprised of a material enough rigid to exert a sufficient pressure on the part on which they contact the head, but not too rigid to cause pain, are preferably plastic or rubber.

[0025] In a further preferred embodiment, the ring according to the invention is provided with plurality vertical notches, in order to make it easier finding the proper position set by the doctor.

[0026] Finally, it is object of the present invention a hat provided inside with the cephalic ring according to the invention so as not to be noticeable.

[0027] The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 shows a top view of the cephalic ring according to the invention;
figure 2 shows a lateral view of the ring applied on the head and an exemplificative temporal block;
figure 3 is a section view taken along line a'-a' of figure 2;
figure 4 shows a second embodiment of the cephalic ring according to the invention;
figure 5 shows a front-rear view of the cephalic ring according to the invention;
figure 6 shows a modification of the embodiment shown in figure 4; and
figure 7 shows a third embodiment of the cephalic ring according to the invention.

[0028] Figure 1 shows a top view of the cephalic ring 1 according to the invention, comprising three pairs of blocks, respectively on the front (3A), temporal (3B) and occipital (3C) side, said blocks having different dimensions, the ring 1 providing also an occipital closure 4.

[0029] In the preferred embodiment of the cephalic ring represented in figure 1, two ends 6, 6' that must be placed at the occipital level are provided with a vertical slot, through which a Velcro® strip 4 is passed, to fix the same when stressed. Particularly, positioning of blocks occurs thanks to the Velcro® lining on the inner surface of ring 2 and on the outer surface of blocks 5.

[0030] Dimensions of three pairs of blocks 3A, 3B, 3C represented in figure 1 are different each other, varying in relation to the patient head dimensions, particularly:

a) occipital blocks 3C have a width between 4cm and 6 cm, a thickness between 1 cm and 2 cm, preferably 1,5 cm; a length exactly corresponding to the ring height, so as to ensure a good adhesion;
b) temporal blocks 3B have a length between 0.5 cm and 1.5 cm, preferably 1 cm, a thickness between 1.5 cm and 3 cm, preferably 2 cm, and are provided on the lower part of a ledge longer than the ring height, said length being between 3 cm and 4 cm so as to project downward for at least 2-3 cm;
c) front blocks 3A can be in number between 2 and 5 (on central block in case an odd number is provided), have thickness and length of about 1 cm, thus not projecting from the ring, and a width between 0.5 cm and 1 cm; they are further provided with an vertically undulated resting surface, thus reducing the compression surface.

[0031] Figure 2 shows a lateral view of the ring applied on the head, and an exemplificative temporal block projecting of few cm from the lower part of the ring; a plurality of notches on the ring facilitates the patient in finding the proper position set by the doctor. Correct position and inclination indicated in the figure are only exemplificative and the doctor will set them. Device can be easily introduced within a hat, so as not be visible.

[0032] Figure 3 shows section a-a' of block of figure 2, provided with a Velcro® lining and supported by a vertical rigid ledge 7 all along its length for supporting the projecting outer part of the ring. Alternatively, block has a smaller thickness and is approached to the compression point by a rigid ledge folded inside. In the specific headache cases, it is not necessary that all blocks be applied,

being chosen in function of pain and the doctor's opinion.

[0033] Observing now figures 4 and 5 of the enclosed drawings, it is shown an embodiment of the cephalic ring studied for patients male tolerating pressure on the front part of the ring on forehead, or for patients wishing wearing the device under a hat, in order to conceal the same.

[0034] Solution suggested aims obtaining prolonged compression on same points where it is obtained by cephalic ring shown in figure 1 - 3, with a different positioning of the front hemi-ring that has been provided according to a vertical orientation.

[0035] Particularly, front part 1' of ring 1 is a vertical part, and it is separated with respect to rear part 1". Said part 1' rests on the cranial vertex, while its ends, provided with block 3B suitable for compression, said block having been suitably positioned in a vertical position, resting on the temporal arteries, in front of tragus of each ear.

[0036] Front-rear view of figure 5 shows that in its upper part, i.e. on the cranial vertex, part 1' of cephalic ring 1 according to the invention is provided with a joint 9 permitting, by a toothed or friction system, fixing opening in different positions, so as to adapt the same to the cranium dimension and exerting the necessary pressure on temporal arteries. A block 10 on the top and possibly two lateral blocks 11, in correspondence of the parietal bones (having a thickness variable with cranium dimensions), keeping upper part 1', thus preventing its sliding backward.

[0037] Compression of occipital arteries occurs by a belt, the ends of which are provided with a series of holes for fixing the same on suitable pins projecting outward from the lower portion of part 1', with such length and tension to conform with the patient.

[0038] Semirigid blocks 3C, which are long about 3 - 4 cm, slide along belt, and are positioned in correspondence of the occipital arteries so as to reduce compression on the same.

[0039] Blocks 3C are comprised of semirigid material and have e thickness different each other, so that, on the basis of head features and dimensions, patient can use blocks exerting the best arteries compression.

[0040] Observing now figure 6, it is shown a second embodiment of the solution shown in figures 4 and 5. in this case, compression of occipital arteries is obtained by two curved rods 12, exerting pressure by suitable rigidity/elasticity features, said rods being at 90° with respect to ring 1, blocks 3C being provided on said rods.

[0041] Coming now to observe figure 7, it is shown a third embodiment of the cephalic ring according to the invention, providing a rear part 1" to be in this case provided horizontally and in correspondence of the rear part of the head. Temporal artery compression occurs by the two rods 12 (said rods comprising the rear part 1"), curved backward of 90° with respect to the ring and provided with blocks 3B having suitable dimensions, and placed on the ring ends. Proper compression force occurs by suitable rigidity/elasticity features of the rods 12; a more rigid material permits obtaining the proper adjustment of the pressure to be exerted. Compression on the occipital arteries occurs by two blocks 3C that can be applied along the ring in the suitable position, by sliding the blocks along the same sliding track provided in the previous embodiment. In order to exert a suitable pressure on arteries, blocks can be expanded by one or more springs provided on a base or inside the same blocks. Same pressure exerted by rods 12 applied at the ends of the ring on temporal arteries prevents motion backward of the ring that could occur due to the rear blocks thrust on the occipital arteries.

[0042] Summarising, invention concerns a cephalic ring 1, comprised of a not-extensible material, and provided with a plurality of semirigid block pairs 3, the position of which along the ring inner surface 2 can be adjusted, characterised in that temporal block pair 3B, provided on a downward projecting part, so as to be in front of tragus, compresses temporal arteries, and occipital level blocks 3C compresses occipital arteries; in the embodiment with front hemi-ring about forehead (thus extending horizontally), also a front block 3A pair is present, not exerting compression on forehead arteries.

[0043] The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Cephalic ring comprised of not-extensible material, providing a plurality of pairs of semirigid blocks, the position of which along the inner surface of the ring can be adjusted, **characterised in that** there are provided at least a pair of blocks at the front level and pairs of blocks at the temporal and/or occipital level, **in that** said blocks at the frontal level do not exert pressure on the sopraorbital and frontal-overtrochlear arteries, and **in that** blocks at the temporal level project from the lower part of the ring of at least 1 cm.

2. Ring according to claim 1, **characterised in that** both occipital blocks and temporal blocks are present.

3. Ring according to claim 1 or 2, **characterised in that** frontal blocks are provided with an undulated resting surface.

4. Ring according to claim 3, **characterised in that** frontal blocks are between 2 and 5.

5. Ring according to one of claims 1 - 4, wherein temporal blocks are provided with a rigid support ledge, vertically placed all along the length of block.

6. Ring according to claim 5, wherein said ledge is comprised of metal or of an alloy.

7. Ring according to each one of the preceding claims, wherein blocks at temporal level project from the lower part of the ring of 1 - 2 cm.

8. Ring according to claim 1, **characterised in that** it is comprised of two hemi-parts, a front vertical part and a rear vertical part; said front vertical part resting on the cranial vertex while its ends, provided with block suitable to compression and suitably straightened rest on the temporal arteries, in front of tragus of each ear; in the upper portion of said vertical part, i.e. in correspondence of the cranial vertex, a joint is provided permitting different fixing positions of the opening of the same, so as to conform it to the cranium dimension and to exert the required pressure on the temporal arteries; a block is further provided on the top, and eventually two blocks are provided laterally, in correspondence of the parietal bones (said blocks having a thickness that can be conformed to the cranium dimensions), keeping the upper part, preventing its sliding backward.

9. Ring according to claim 8, **characterised in that** said rear part is comprised of two elastic rods.

10. Ring according to claim 8, **characterised in that** said rear part provides a fixing and adjustment belt.

11. Ring according to claim 1, **characterised in that** it is comprised of two hemi-parts, a rear part to be applied horizontally and in correspondence of the head rear portion, and a part extending downward, compression at the temporal arteries level being realised by two rods provided with block with suitable dimensions, compression at the occipital arteries level occurring by two occipital blocks.

12. Ring according to each one of the preceding claims, wherein it is provided on its inner surface with a Velcro® lining, and blocks are provided on the outer surface with a Velcro® lining.

13. Ring according to each one of the claims 1 - 12, wherein it is provided on its inner surface with a slot or track, said blocks being movable and fixable along said slot or track by a screw or a snap fitting.

14. Ring according to each one of the preceding claims, comprising a closure device.

15. Ring according to claim 14, wherein said closure device is a Velcro® strip passing through the vertical slots of the ring ends.

16. Ring according to each one of the preceding claims, wherein it is provided on its inner surface with a Velcro® lining, and blocks are provided on the outer surface with a Velcro® lining.

17. Ring according to each one of the preceding claims 1 - 16, wherein said ring is provided along its inner surface with a slot or with a track, and blocks are fixed along said slot or along said track by a screw or snap system.

18. Ring according to each one of the preceding claims, wherein said inelastic material is chosen among metal, light alloy leather, tissue, inflatable rubber material.

19. Ring according to each one of the preceding claims, having a bigger diameter between 18 cm and 24 cm and a lower diameter between 16 cm and 20 cm, while height is between 0.5 cm and 2 cm.

20. Ring according to each one of the preceding claims, wherein said semirigid material blocks are comprised of plastic or rubber.

21. Ring according to each one of the preceding claims 1 - 20, wherein said ring is provided with plurality vertical notches.

22. Hat provided inside with the cephalic ring according to claims 1 - 21.

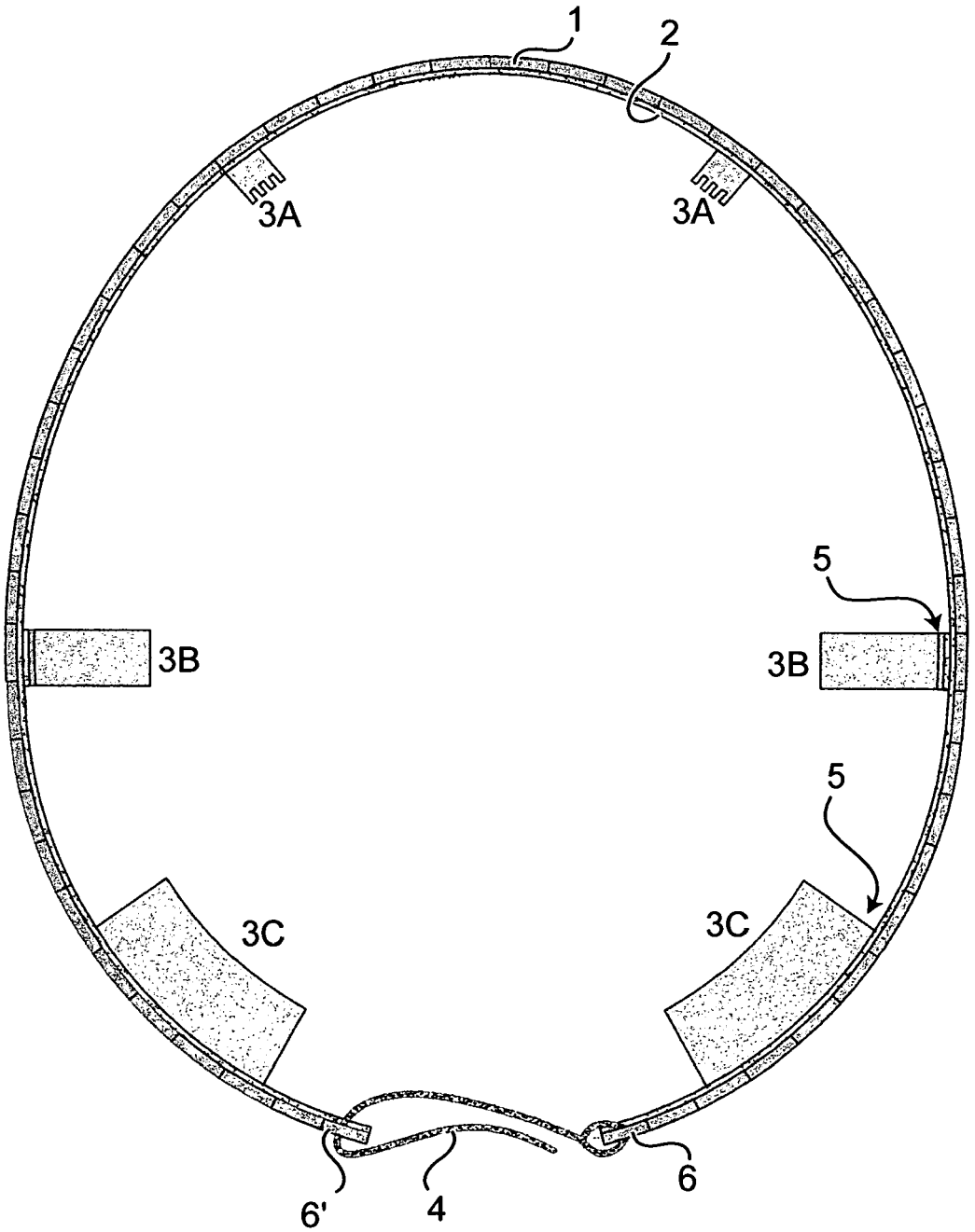

Fig. 1

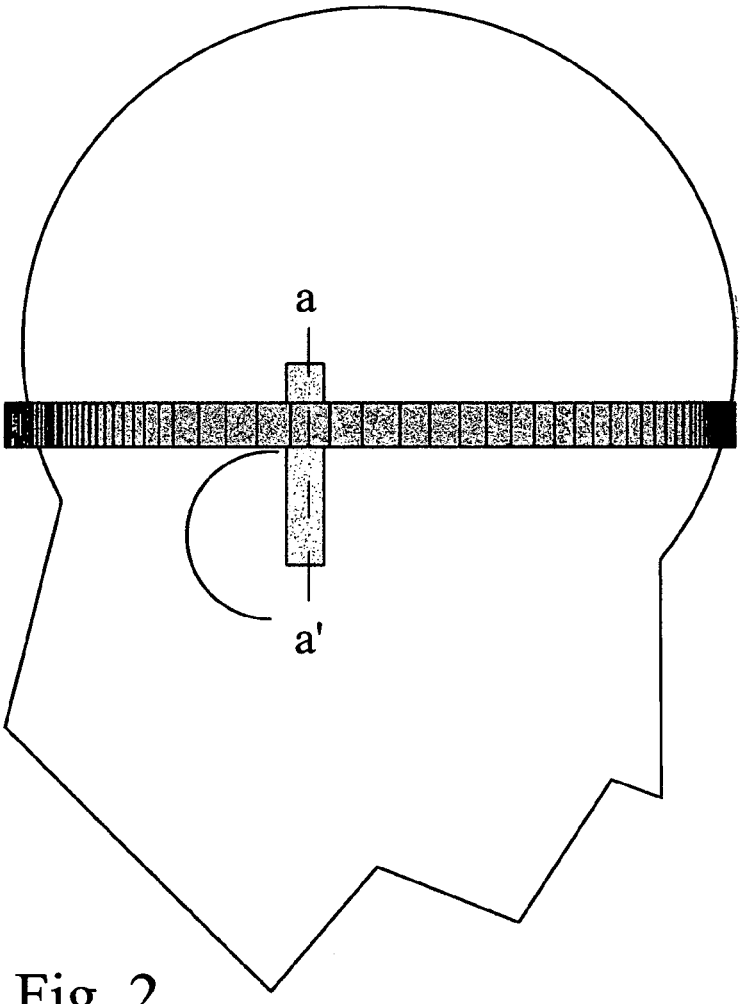

Fig. 2

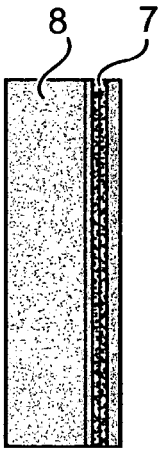

Fig. 3

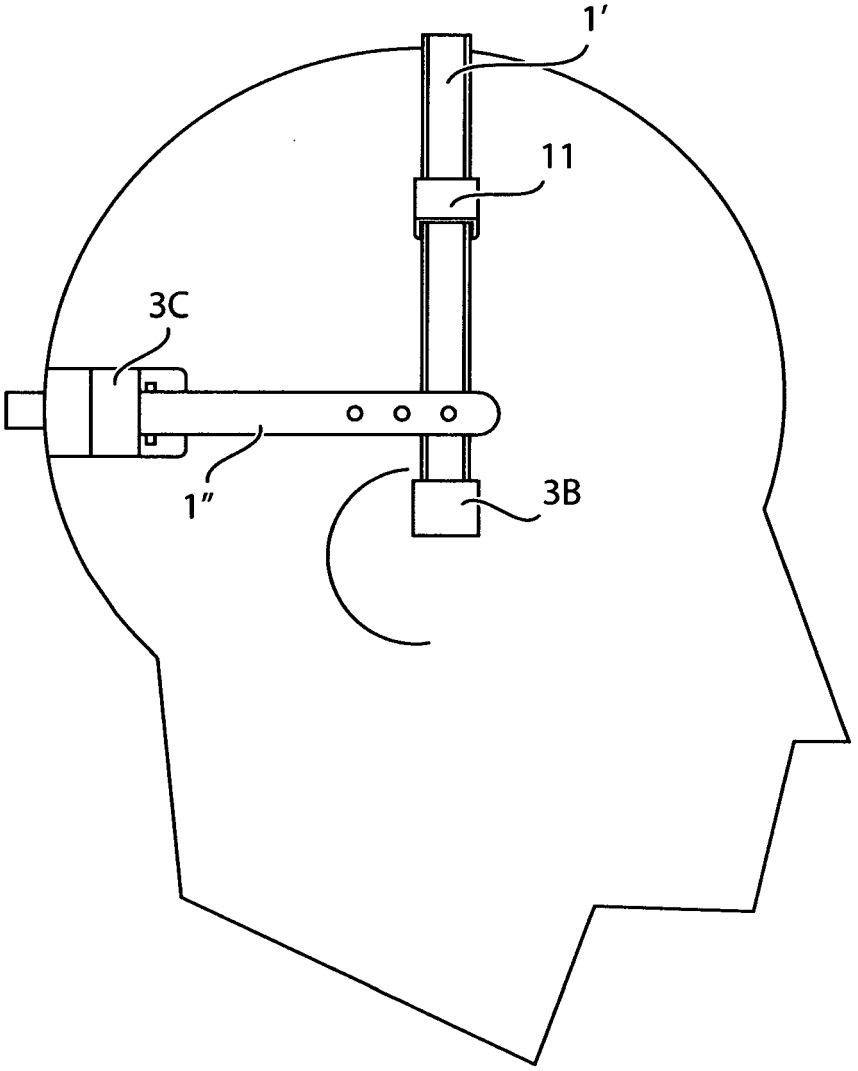

Fig. 4

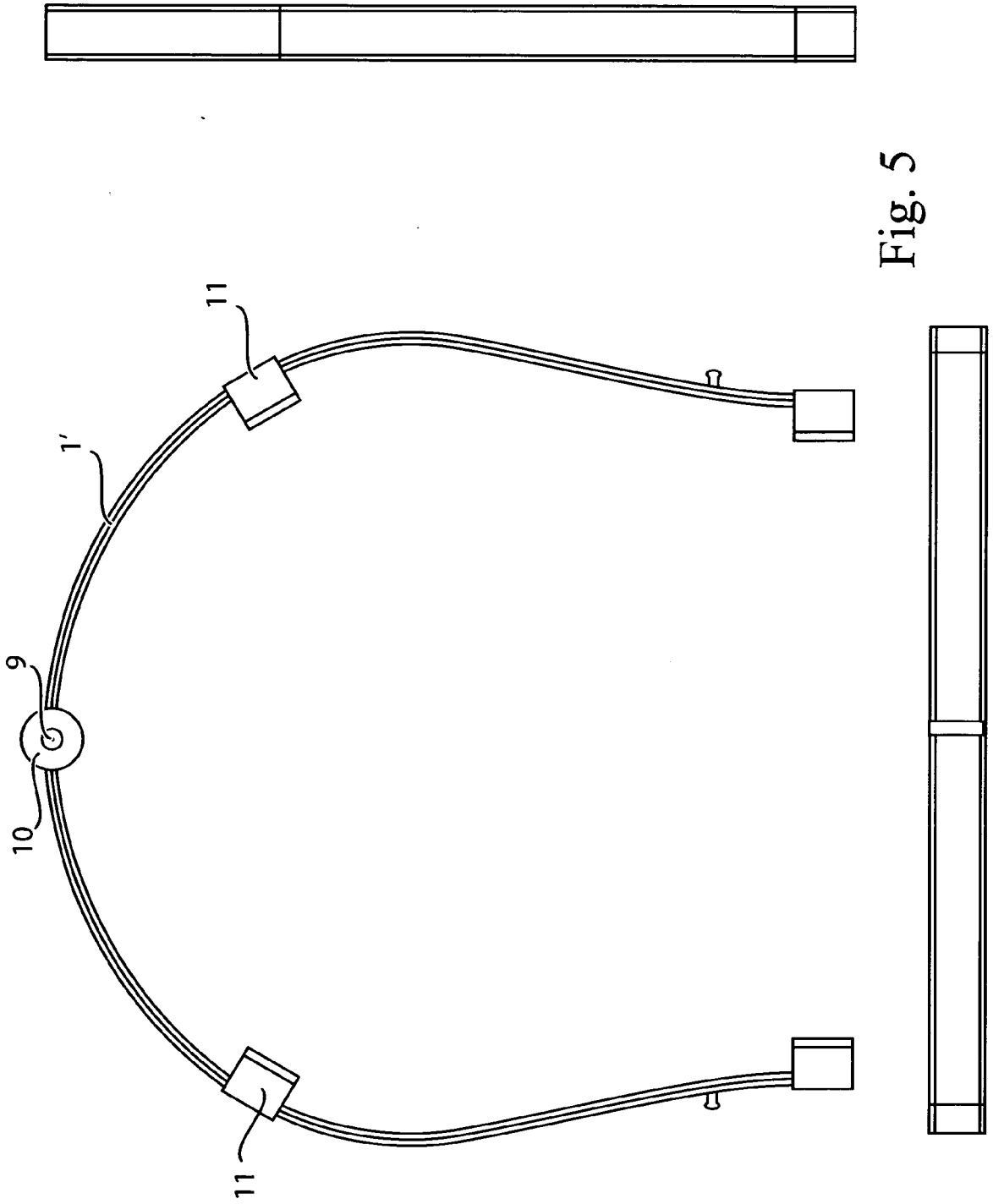

Fig. 5

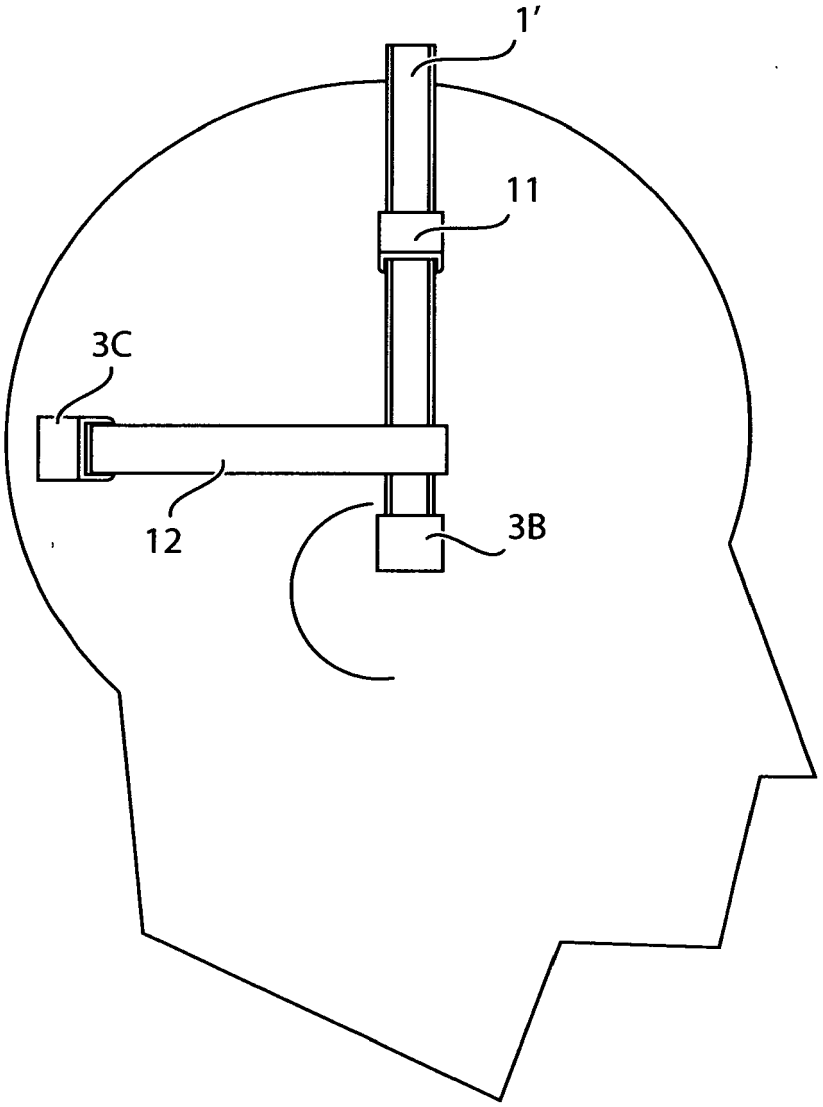

Fig. 6

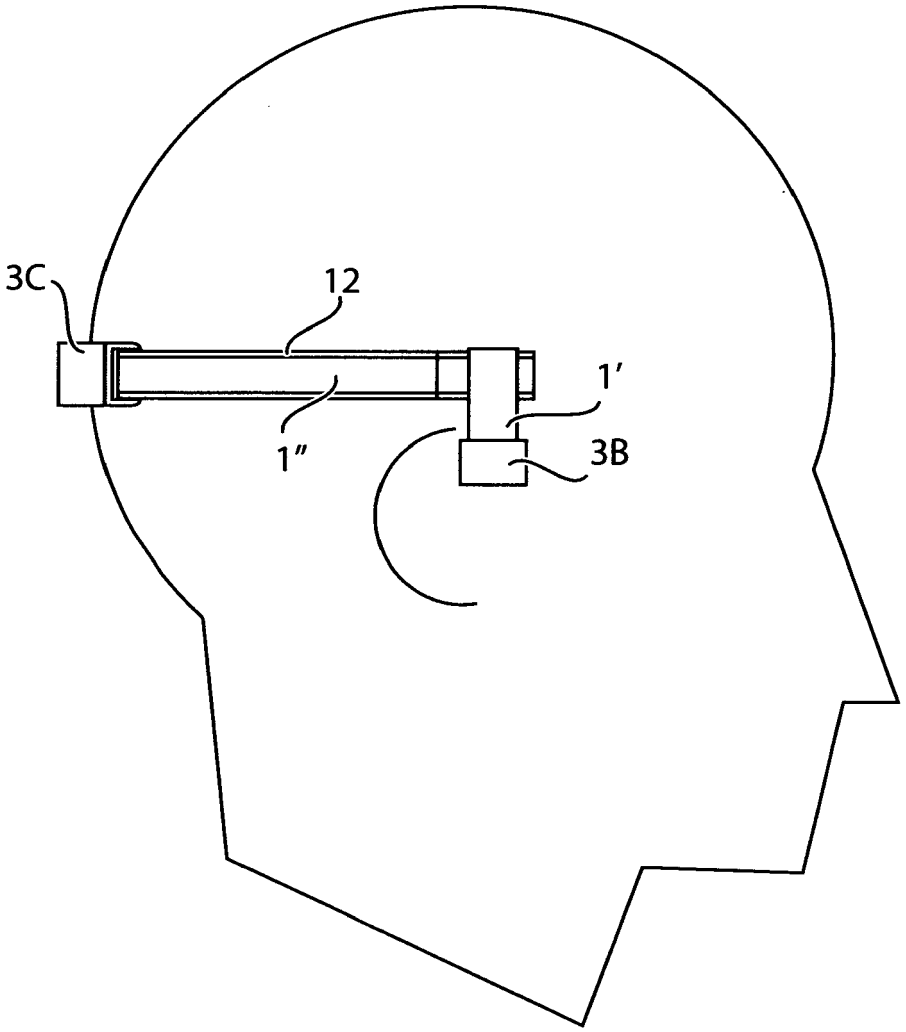

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5298

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 July 2006	Elmar Fischer

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