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(54) Benævnelse: **GREB TIL ET STYR TIL ET TOHJULET KØRETØJ**

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The present invention relates to a grip for the handlebar of a two-wheeled vehicle, and in particular of a bicycle.

The handlebar of a two-wheeled vehicle, and in particular of a bicycle, generally consists of a tube, usually metal, curved or straight and comprising at least two portions grippable by the user in order to drive the vehicle. Said portions are usually essentially rectilinear and perpendicular to the frame of the two-wheeled vehicle. For greater comfort and better grippability, said portions of the handlebar are often covered with grips made of rubber or other elastic material. To drive the vehicle, the user places the palm of his hand against the handlebar and grasps it between his thumb and his other four fingers.

However, these conventional grips merely conform to the shape of the handlebar. They do not offer a larger surface area of support and are therefore very unergonomic. The stresses on the joints of the user's wrist are considerable and therefore contribute to increased wear of the articular surfaces of the wrist and decreased muscular efficiency. The absence of an area of adequate support adapted to the shape of the wrist in these grips can also lead to pain when the vehicle, such as a bicycle, is driven for long periods.

Another grip, corresponding to the preamble of claim 1, is known from document DE -U-9112567.

The aim of the present invention is to produce a grip for the handlebar of a two-wheeled vehicle, and in particular of a bicycle, that is ergonomic and adapts to the user's hand, offering a positioning and a comfortable support for the user's wrist, thus decreasing the articular strains and reducing the risk of pain when the vehicle is driven for long periods, while allowing precise steering of said vehicle.

The present invention relates to a grip for the handlebar of a two-wheeled vehicle, and in particular of a bicycle, having the characteristics set out in claim 1.

Hereinafter, the word "wrist" will be used to mean all the bones comprised by the lower extremity of the radius, the lower extremity of the cubitus (also known as the ulna) and the carpus, itself comprising eight bones divided into two rows. The word "hand" will be used to mean all the bones comprised by the carpus, the metacarpus (comprising five metacarpal bones) and the fourteen phalanges.

The annexed drawings illustrate schematically and by way of non-limitative example an embodiment of a grip for the handlebar of a two-wheeled vehicle, and in particular of a bicycle, according to the invention.

Figure 1 illustrates a grip according to the invention fitted onto the handlebar of a bicycle and viewed from above with respect to the bicycle.

Figures 2a and 2b are front and side views, respectively, of a handlebar of a bicycle equipped with two grips according to the invention as illustrated in Figure 1, showing the position of the wrists and hands of a user of said bicycle.

Figure 3 illustrates all the bones of the left wrist and hand of a user holding a grip according to the invention, showing the positioning of said bones.

Figure 4 is a side view of the left forearm, wrist and hand of a user holding the grip according to the invention.

Figure 5 illustrates all the bones of the left wrist and hand of a user holding a handlebar grip of the prior art.

Figure 6 is a side view of the left wrist, hand and forearm of a user holding a grip of the prior art.

The grip 1 according to the invention and as illustrated in Figures 1 to 4 comprises an elongated, hollow main body 2 intended to be fitted onto the handlebar 3 of a two-wheeled vehicle, and in particular of a bicycle. Preferably, the grip 1 is fitted onto a section of the handlebar 3 that is essentially rectilinear and perpendicular to the frame of the bicycle.

The grip 1 further comprises a shaft 4 that is integral with the main body 2 and terminates in an abutment 5. Preferably, the abutment 5 has a wide, rounded shape.

The shaft 4 is inclined at an angle of 30° to 60°, preferably 40°, relative to the longitudinal axis of the handlebar.

As shown in Figures 2 to 4, the user places his palm against the main body 2 of the grip 1 and grasps the shaft 4 of said grip between his thumb and his other fingers. Thus, contrary to the use of the conventional grips 20 illustrated in Figures 5 and 6, the user's hand does not grasp the handlebar but the shaft 4 of the grip 1.

With the grip 1 according to the present embodiment, the carpus 7 of the user's hand on the grip 1 is supported in line with the handlebar rather than above it. The main body 2 must therefore be sufficiently wide and presents a flat portion 2a shaped in such a way as to provide better support for the carpus 7 and the palm of the hand. Preferably, the main body 2 further comprises a supplementary support area 6 offering additional and different support to the rider.

As illustrated in Figures 2 to 4, in the working position, the metacarpals 8 of the fingers, with the exception of that of the thumb, rest on the shaft 4. The shaft 4 is sufficiently long to avoid permanent support on the intermetacarpal space 16 of the thumb and the index finger, and in particular on the

articulation 9 between the metacarpals 8 and the phalanx 10 of the index finger as well as on the articulation 11 of the first phalanx of the thumb 12.

In addition, the shaft 4 is sufficiently short to provide, for example during braking, immediate support to the hand thanks to the abutment 5. The abutment 5 is also sufficiently wide to provide, during braking or on steep gradients, sufficient support to the intermetacarpal space 16 between the first and second metacarpals 8 (of the thumb and the index finger respectively) as illustrated in Figures 2a and 2b. The abutment 5 thus prevents the hand from sliding. The wide shape of the abutment is also an asset during downhill travel, when the abutment 5 blocks the user's hand and provides it with good support. In addition, the abutment 5 offers, if desired, additional support to the hand, allowing the rider to vary the supports and therefore the stresses and thus to increase the overall comfort. Preferably, the abutment 5 has a rounded shape as illustrated in the drawings, but could in variants have any other appropriate shape, the essential point being that it is sufficiently wide to prevent the hand, and in particular the space between the thumb and the index finger, from sliding along the shaft 4.

The dimensions of the shaft 4 and the abutment 5 therefore depend on the morphology of the user, and in particular on the size of the palm for the length of the shaft 4 and on the span of the hand for the width of the abutment 5. Said dimensions are therefore preferably between 7 cm and 20 cm and between 5 cm and 10 cm, respectively. Multiple embodiments could therefore be created, depending on whether the grip according to the invention is intended for use by a child or by an adult man or woman.

The angle of the shaft 4 with the longitudinal axis of the handlebar 3, between 30° and 60°, corresponds to the optimal angle of pronosupination (movement of axial rotation of the forearm turning the palm downwards for pronation and upwards for supination) for the muscular efficiency of the forearm.

As illustrated in Figure 2b, the grip 1 comprises a slot 18 allowing easy fitting and adjustment of the grip 1 on the handlebar 3. An adjusting screw 17 cooperating with a lock-nut (not shown) allows the grip 1 to be fixed by screwing on to the handlebar 3 in a selected position. Any other suitable means of tightening and adjustment could replace the system that comprises the slot 18 and the screw 17 and its lock-nut.

The angle of flexion/extension of the wrist is adjusted to suit the user's comfort by pivoting the grip 1 around the handlebar 3 backwards or forwards respectively after slackening the adjusting screw 17. As illustrated in Figure 6, it is practically impossible to adjust the flexion and/or extension of the wrist with a grip of the prior art 20, and the wrist is always in extension, which in the long term may cause pain.

In addition, as illustrated in Figure 5, a grip of the prior art 20 obliges the user to adopt a radial inclination of the carpus 7 relative to the longitudinal axis of the radius 14. This unergonomic and non-

physiological bending causes articular stresses particularly on the scaphoid 7' and the trapezium 7" of the carpus 7 of the user's wrist. The grip 1 according to the invention makes it possible to avoid such a bending. As illustrated in a view from above in Figure 3, in the working position, the alignment of the carpus 7 on the radius 14 and the cubitus 15 is optimal (no radial inclination). Similarly, contrary to the prior art and as illustrated in a side view in Figure 4, total alignment between the bones of the carpus 7 and the radius 14 and the cubitus 15 is possible with a grip 1 according to the invention, said carpus 7 and said cubitus 15 and radius 14 being in the same plane.

The grips according to the invention offer:

1. a reduction in the unit pressure of the articulations with respect to each other due to the fact that all the articular surfaces of the articulations offer each other their largest available supporting surfaces, as illustrated in Figure 3. Figure 5 provides a view comparable to that of Figure 3 but this time for a grip of the prior art. Of note are the pressures exerted by the radius 14 on the outer portion of the carpus 7 and particularly the scaphoid 7' and the trapezium 7", as well as by the carpus 7 on the metacarpals 8. The reduction in pressure thus offered allows:
   a. a reduction in the constraints of interarticular pressures, thus reducing articular wear;
   b. a reduction in articular pains;
   c. better muscular efficiency (the less constrained the articulations, the better the muscular contraction and therefore the force). Since muscular efficiency is optimal, this avoids excessive muscular contractions and tensions, thus allowing:
      i. better arterio-venous circulation;
      ii. better muscular relaxation;
      iii. better relaxation of the sensory and motor nerves, which avoids the spreading of painful sensations due to mechanical tensions of the sensory and motor nerves.
2. A reduction in persistency of stresses, due to the shape of the body of the grip 1, which is softened to mould to the shape of the hand. The purpose of this is to avoid support areas that, in the long run, are uncomfortable, painful or even cause articular wear (osteoarthritis).

The grip according to the invention, and in particular the main body 2 and the shaft 4, are preferably made from hard plastic and may be covered with an anti-slip coating. Any other appropriate material could be used, such as metal, aluminium or carbon, for the manufacture of the body 2 and the shaft 4.

Preferably, the abutment 5 comprises lateral portions 5a and 5b, visible in Figures 1 to 3, made from or covered with a soft and elastic material having a low value of approximately 18 on the Shore OO scale (for the sake of comparison, on the same scale, chewing gum has a value of 20 and a gel bicycle saddle has a value of between 15 and 30). Similarly, the flat portion 2a of the main body 2, the support

area for the user's palm and the supplementary support area 6 are preferably made from the same material as the lateral portions 5a and 5b of the abutment 5. Any other more or less soft and elastic material could be used.

The grip 1 according to the invention offers great comfort to the user while allowing him to operate the brake levers (braking system with discs or shoes) as well as the gear-change levers of the vehicle and in particular of the bicycle.

The present invention therefore produces an ergonomic grip for the handlebar of a two-wheeled vehicle and in particular of a bicycle, providing the user with great comfort of support, which makes it possible to reduce the risk of pain and wear of the articulations when driving the vehicle.

Patentkrav

1. Greb (1) til et styr (3) til et tohjulet køretøj og navnlig en cykel, hvilket styr omfatter et hovedlegeme (2) af i alt væsentligt en cylindrisk form, der kan tilpasses på en del af styret (3), der er retlinet og i alt væsentligt vinkelret på køretøjets stel, og en stang (4), der står i forbindelse med hovedlegemet (2), hvor vinklen mellem stangen (4) og den langsgående akse af styret (3) ligger mellem 30° og 60°, kendetegnet ved, at stangen (4) i sin fri ende har en stopanordning (5), der er formet til at holde brugerens hånd og yde støtte.

2. Greb (1) ifølge krav 1, kendetegnet ved, at hovedlegemet (2) har en bred og affladet del (2a), der tilpasses formen af brugerens håndflade og navnlig håndrod (7).

3. Greb (1) ifølge et af de foregående krav, kendetegnet ved, at hovedlegemet (2) omfatter et supplerende støtteområde (6), der gør det muligt for brugeren at variere støtte og placeringer af sit håndled.

4. Greb (1) ifølge et af de foregående krav, kendetegnet ved, at hovedlegemet (2) og stangen (4) er fremstillet af et stift, hult plastmateriale og er dækket af en skridsikker belægning.

5. Greb (1) ifølge et af de foregående krav, kendetegnet ved, at det supplerende støtteområde og/eller den brede og affladede del af hovedlegemet (2) og/eller sidedelene (5a, 5b) af stopanordningen (5) er fremstillet af et elastisk og blødt materiale, hvis værdi på Shore-00-skalaen ligger mellem 15 og 20.

6. Greb (1) ifølge et af de foregående krav, kendetegnet ved, at vinklen mellem stangen (4) og den langsgående akse af styret (3) er på 40°.

7. Greb (1) ifølge et af kravene 1 til 6, kendetegnet ved, at længden af stangen (4) og bredden af stopanordningen (5) ligger henholdsvis mellem 6 og 20 cm og 5 og 10 cm.

Fig.1

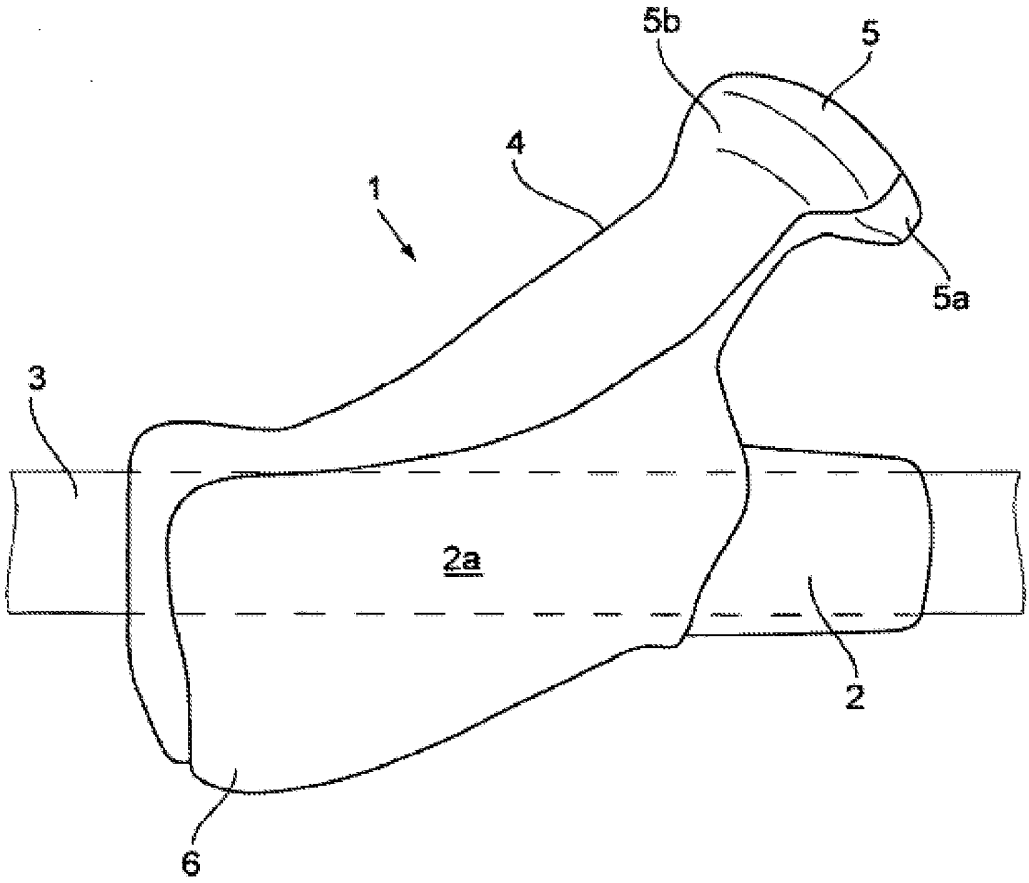

Fig.2a

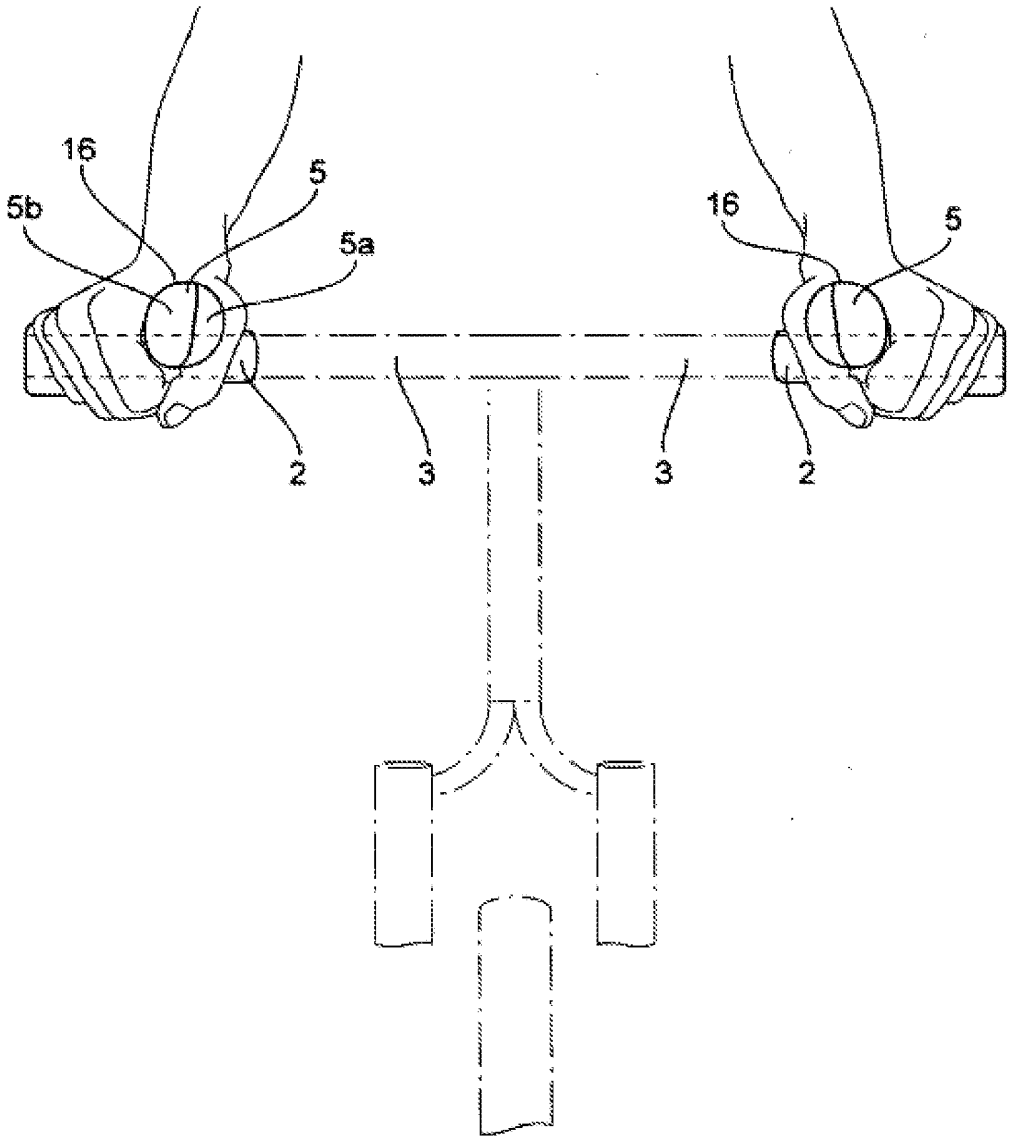

Fig.2b

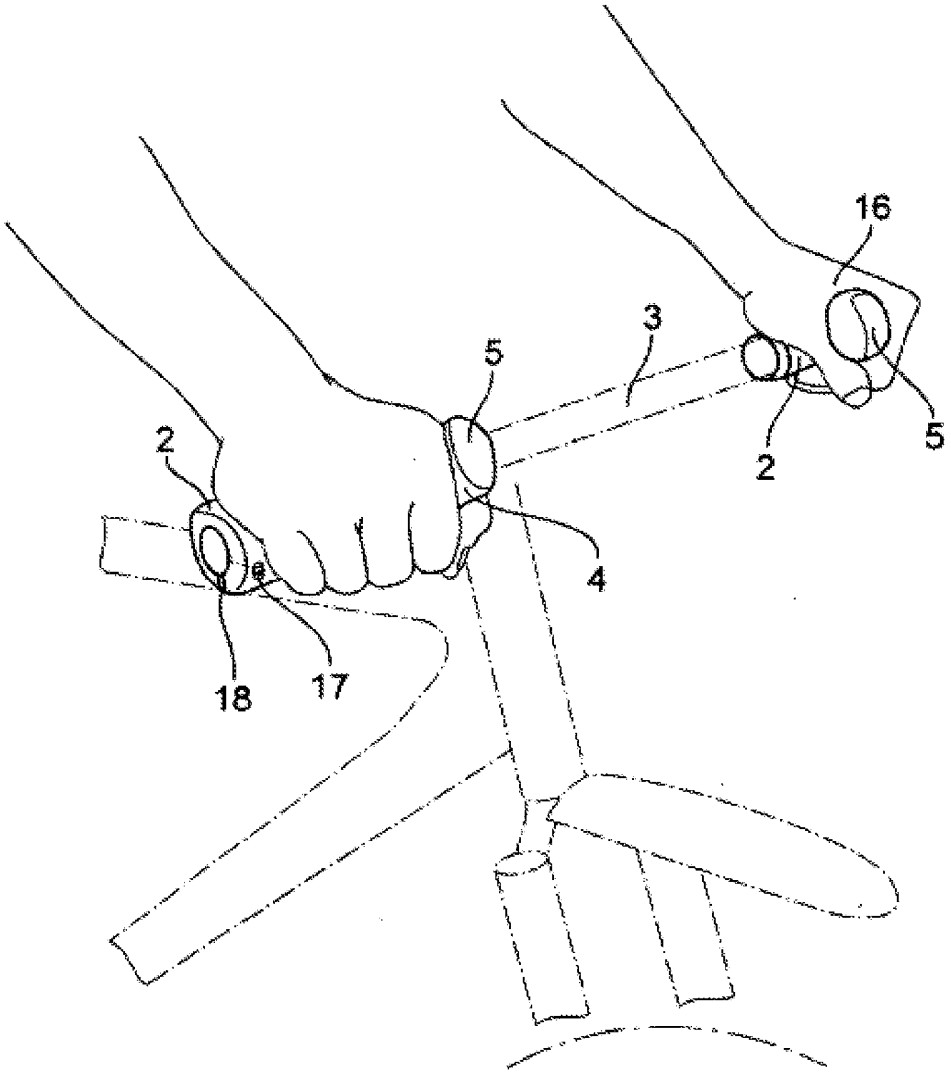

Fig.3

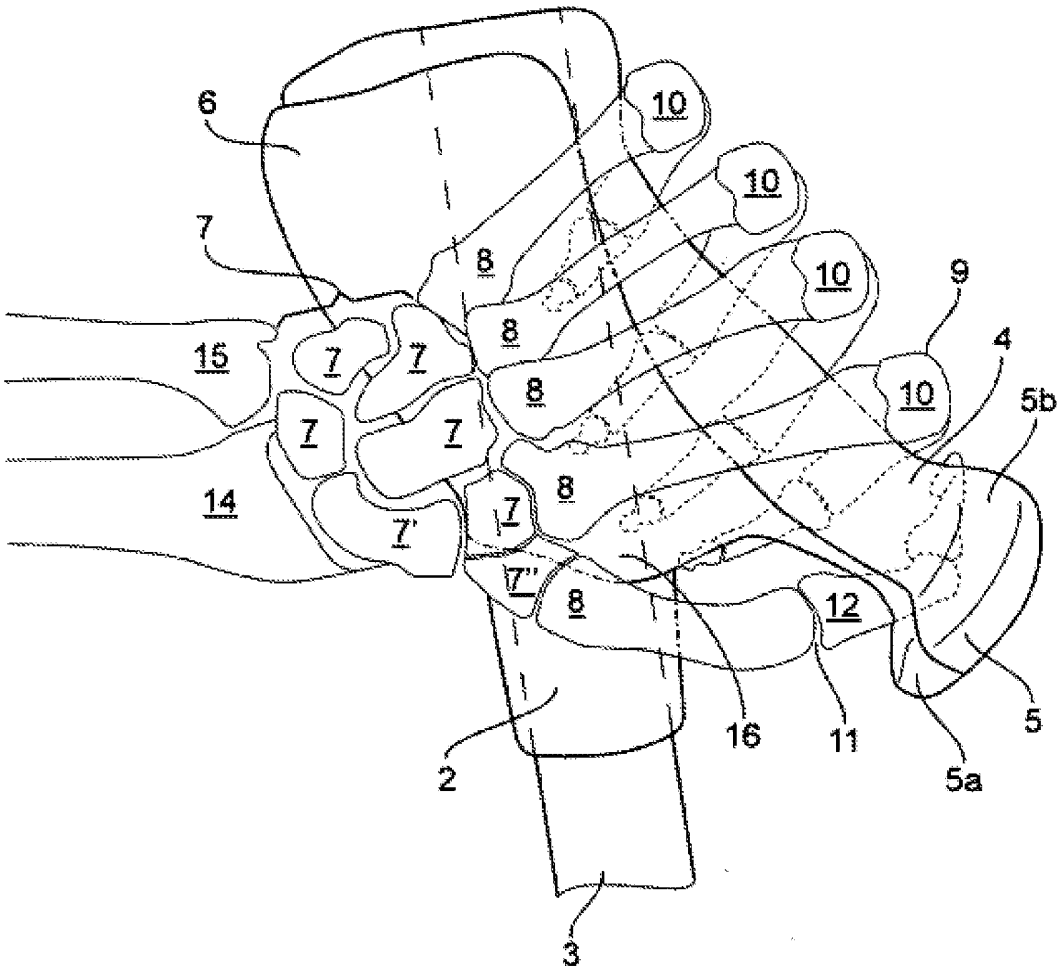

Fig.4

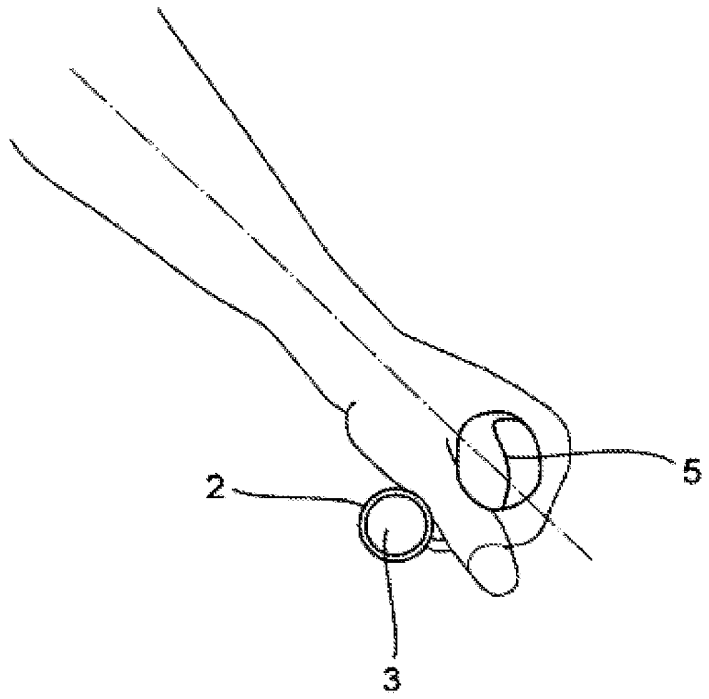

Fig.6

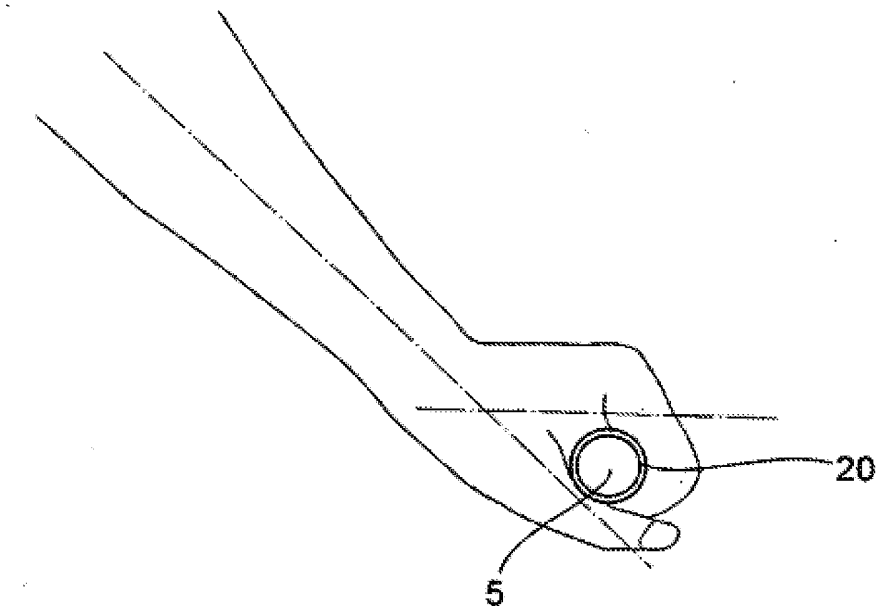

Fig.5