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(54) Title: DRIVING INDICATOR WITH LED INTEGRATED IN BRACELET FOR CYCLISTS AND MOTOR-CYCLISTS

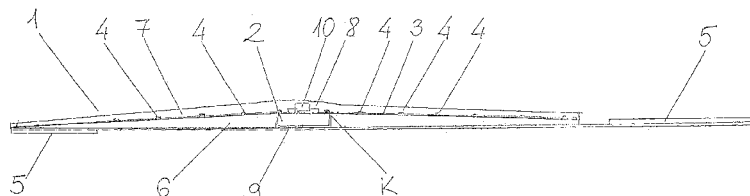


FIG. 1

(57) Abstract: The subject of the invention is a driving indicator with LED integrated in bracelet for cyclists and motor-cyclists, which is located on the right and left wrists of the cyclists and motor-cyclists, and it switches on resulting from the shift of the arm, and its task is to make visible the traditional hand - indication of the change of direction in the dark, under adverse visual conditions. The device according to the invention is fixable on the arm or wrist, and there are light-emitting LEDs in its cover connecting from an electrical view to a flashing unit. It is characterized by that, a flexible, thin, printed electronic circuit board (3) with LEDs (4) fixed with soldering, or with adhesives, is placed between the lower cover (6) and upper cover (7) of a device (1) formed as a bracelet fixable to the arm, or the wrist, made of flexible material, consisting of an oblong lower cover (6) and an oblong upper cover (7), also made of a flexible material and the covers are built together, furthermore in the middle of the lower cover (6) a battery house (9) suitable for housing of supply source (2) in given case a button cell, or button dry battery, and above said battery house (9) there is a displacement detector (10) perceiving the shift, as well as flashing light unit (8) are situated, from mechanical and electric aspect fixed, respectively connected to the printed circuit board (3) by soldering, or with adhesive.

***Driving indicator with LED integrated in bracelet for cyclists and motor-cyclists***

The subject of the invention is a driving indicator with LED integrated in bracelet for cyclists and motor-cyclists, which is located on the right and left wrists of the cyclists and motor-cyclists, and it switches on resulting from the shift of the arm, and its task is to make visible the traditional hand - indication of the change of direction in the dark, under adverse visual conditions.

During winding of cyclists and motor-cyclists the rule is to put out the hand, indicating the intention for winding. It is dangerous, because it needs letting go of the handlebar, it can not always be seen well, and under adverse visual conditions, respectively in the the dark, this movement can not be seen.

Currently on the bicycles and scooters indicators located in the weight of the bicycle or motor-bike functioning from the handlebar are most frequently applied. There is also an index, built-in to the overcoat, which shows the direction of the winding in the LED-s on the right and left side of the back, by pushing a switch located at the wrist. All these devices are activated in each case with the help of a switch pushed by a finger. Looking for the switch might detract attention from the traffic. An additional drawback of the traditional devices is, that noticing them can be limited from certain angles.

The CN2061243 utility model description makes known a multipurpose flashlight which is used for the lighting during the riding, walking, and working. The utility model is characterized in that the outside shell of the electric torch is provided with slings, lugs, and spring pieces. The multipurpose flashlight can be hung on the bicycle, and worn on the waist belt or wrist by slings, the lugs, or the spring pieces to light. People's hands are released to do various actions. The utility model has the advantages of simple structure, convenient operation and wide purpose.

The CN2593586 utility model description makes known a safety raincoat, particularly a raincoat for showing the turning directions of bicycles and motorcycles. The utility model is characterized in that left and right shoulders of the raincoat are provided with flash turning indicating lamps, wherein high-brightness LEDs are arranged in elastic plastic cement casings of the flash turning indicating lamps, and left and right sleeves are provided with triggered direction control switches; a user waves an arm instantaneously to trigger the triggered direction control switches, then electrodes are triggered by movable metallic balls in the switches, and thus, the purpose of control can be achieved. The utility model has the main purpose that the utility model can show the turning travel directions of bicycles and motorcycles traveling in a rainy day and cause the attention of vehicles in the rear, and the purpose that the vehicles in the rear can not collide with the users can be achieved. The life safety of the users can be ensured, and the safety guard can be provided for users.

The CN201302079 utility model description makes known a bicycle turning indicating and lighting device, in particular to a bicycle turning indicating and lighting device which is capable of ensuring the running safety and using safe and common double A

batteries; the bicycle indicating and lighting device consists of a power supply module, an indicating module, a lighting module and a control module which are arranged on a bicycle; the power supply module is a rainproof battery box which is internally provided with a double A battery; the indicating module comprises a graphics indicating unit consisting of an LED and a voice indicating unit consisting of a buzzer; the control module consists of a control module I and a control module II which are installed on the handle of the bicycle and provided with switches; the lighting module is a white light LED lighting unit set which is arranged on a standpipe of the bicycle, and has the turning indicating function, realizes the adjustment of light on the indicating light signal intensity through light-sensitive elements, reduces the cost of the device by using LED and saves energy, and is used for the turning direction indicating and lighting at night for the non-motor vehicles such as bicycles, tricycles and the like; and the bicycle turning indicating and lighting device has the advantages of low cost, simple production and strong practicability and development value.

The US 4903176 patent description makes known a fashionable bracelet having a series of running flash lights which comprises an annular body made of transparent or translucent material and having a channel grooved in an inner sidewall thereof for engaging a bulb belt having a plurality of flash bulbs of different colors connected to outlet legs of an integrated circuit and a power panel having at least a battery connected to an inlet end of the integrated circuit through a contact switch and a snap ring adapted to be engaged in the channel and positioned over the belt for holding the belt in place and actuating ON and OFF operation of the contact switch.

The FR 2928477 patent description makes known a wristlet for e.g. cyclist, during cycling in night time, has luminous and flashing device, and LED supplied with power by electric cells connected on printed circuit board, where LED, electric cells and circuit board are housed in case. The wristlet has a luminous and flashing device, and an LED supplied with power by a set of electric cells connected on a printed circuit board, where the LED, electric cells and the printed circuit board are housed in a case. The case is held by the flexible wristlet, which encircles a wrist of a user. The electric cells supply power to the printed circuit board, and are connected to a position detector comprising a filter and an angular displacement unit.

The DE 202004004239 (U1) utility model description makes known a bicycle signal light has switch provided on bracelet to turn signal lights ON and OFF, such that signal lights are protected and arranged on bracelet which is fastened to wrist of cyclist. A switch is provided on the bracelet to turn the signal lights ON and OFF.

The DE 4035591 patent description makes known an ornamental headband, bracelet or girdle - has coloured LEDs energised from batteries via integrated circuit concealed between layers of material, and programmed for special effects. The band is mfd. of leather or fabric in two layers between which electrically conductive film is connected to light-emitting diodes or other luminous electronic components, switched on and off by a programmable microchip. Power is supplied from miniature batteries. The band may be secured, e.g. by a velcro fastening around the forehead or wrist, or on the hips. Electronic components in similar relationship may also be fitted to spectacles or articles

of clothing. The advantage of the using of the device that already existing articles of fashionable adornment can be improved and extended esp. for young people.

The solutions described above and used in practice are partly complicated, of complex structure, partly they are not reliable enough for use of cyclists and motor-cyclist for the realization of indication of direction. Their production is also complicated, their use, their placing and fixing on the arm, respectively on the wrist is awkward.

The aim of the invention was the creation of such a mobile device, that has an independent electrical source, it can signal to any direction with great intensity, its switching on can be realized almost instinctively without distracting the least attention, only by the moving of the device. All this should be realized with a slight weight, in waterproof finish, in such a way, that the positioning of the sensor of the movement can be ensured.

When working out the solution according to the invention, I realized, that in case - a flexible, thin, printed electronic circuit board with LED-s fixed with soldering, or with adhesives- is placed between the lower and upper cover of a device formed as a bracelet fixable to the arm, or the wrist, made of flexible material, consisting of an oblong lower cover and an oblong upper cover, also made of a flexible material and built together, furthermore in the middle of the lower cover a battery house suitable for housing a button cell, or button dry battery above which there is a sensor unit perceiving the shift, as well as a blinker are situated, fixed, respectively connected to the circuit foil by soldering, or with adhesive, then the set aim can be achieved.

The invention is a driving indicator with LED integrated in bracelet for cyclists and motor-cyclists, which is fixable on the arm or wrist, and there are light-emitting LEDs in its cover connecting from an electrical view to a flashing unit. The device is characterized by that, a flexible, thin, printed electronic circuit board with LEDs fixed with soldering, or with adhesives, is placed between the lower cover and upper cover of a device formed as a bracelet fixable to the arm, or the wrist, made of flexible material, consisting of an oblong lower cover and an oblong upper cover, also made of a flexible material and the covers are built together, furthermore in the middle of the lower cover a battery house suitable for housing of supply source in given case a button cell, or button dry battery, and above said battery house there is a displacement detector perceiving the shift, as well as flashing light unit are situated, from mechanical and electric aspect fixed, respectively connected to the printed circuit board by soldering, or with adhesive.

In one preferred embodiment of the solution according to the invention, at the ends of the device there are velcros placed in the known way, and their joining together ensures the bracelet-like fixing.

In another preferred embodiment of the solution according to the invention, the lower cover is formed from leather or a fabric-like material.

In a further preferred embodiment of the solution according to the invention, the lower cover is formed in one piece from a flexible material, in given case from plastic or rubber, and in given case it is of spongy structure.

In a further preferred embodiment of the solution according to the invention, the lower cover is leather, or a fabric-like material, as well as a flexible material, in given case an ensemble of plastic or rubber structurally connecting with each other.

In a further preferred embodiment of the solution according to the invention, the upper cover is formed in one piece, from a flexible material, in given case from plastic or rubber, and is transparent as a whole, or in the part above the LEDs.

In a further preferred embodiment of the solution according to the invention, the device is made of flexible plastic by casting or by injection molding in one or more steps, formed as a single unit.

In a further preferred embodiment of the solution according to the invention, the supply source ensuring the supply voltage of the device is connected to the flashing light unit through a switch, in given case through an SMD microswitch and through the displacement detector.

In a further preferred embodiment of the solution according to the invention, the flashing light unit and the displacement detector are spare parts fixed with SMD sleeving, furthermore the flashing light unit is in given case a multivibrator formed on an integrating circuit chip.

In a further preferred embodiment of the solution according to the invention, the displacement detector is in given case an electronic device functioning on the principle of a bank-and-turn indicator or a gyroscope, or an accelerometer.

In a further preferred embodiment of the solution according to the invention, the LEDs are connected parallel with each other to the output terminal of the flashing light unit.

In a further preferred embodiment of the solution according to the invention, the battery house housing the supply source in given case can be laterally opened partly, or wholly, and is preferably closed with a closing plate or cover.

In a further preferred embodiment of the solution according to the invention, the printed circuit board is situated in the plastic arm strap, in the central line of the thickness of the plastic arm strap, and the battery house housing the supply source is placed below the printed circuit board.

In a further preferred embodiment of the solution according to the invention, the printed circuit board is situated on the upper part of the plastic arm strap of the device, in given case fixed to it by adhesive, and is provided from the upper part by an additional covering layer, and the battery house housing the supply source is placed below the printed circuit board in the nest formed in the plastic arm strap.

In a further preferred embodiment of the solution according to the invention, the printed circuit board is situated on the lower part of the plastic arm strap of the device, in given case fixed to it by adhesive and is provided from below with an additional covering layer, and the battery house housing the supply source is placed below the printed circuit board in the nest formed in the plastic arm strap.

The solution according to the invention is furthermore set forth by the enclosed drawings.

The Fig 1 shows the side view of the device according to the invention partly in section, with certain partial units and their layout.

The Fig 2 shows the top view of the device according to the invention with certain partial units and their layout.

The Fig 3 shows the electric block schematic of the device according to the invention with the electric partial units and their connections.

The Fig 4 shows another possible realization of the device according to the invention in outspread position, in top view.

The Fig 5 shows the device according to Fig 4 in outspread position, in side view.

The Fig 6 shows the side view of the device according to the invention.

The Fig 7 shows another possible realization of the bracelet according to the invention in side view.

The Fig 8 shows the device according to Fig 7 in open position.

The Fig 9 shows the device according to Fig 7 in closed position.

The Fig 10 shows the closed device according to Fig 9 in top view.

The Fig 11 shows the closed device according to Fig 9 in bottom view.

The Fig 1 shows the side view of a possible realization of the device according to the invention partly in section, with certain partial units and their layout. The device 1 according to the invention consists of an oblong lower cover 6 made of flexible material built together with an upper cover 7 made also of flexible material and fixed to the lower cover 6 with adhesives, or by injection molding or by stitching. The material of the lower cover 6 can be in given case fabric-like, or in case of a possible different realization of the lower cover 6 it can be formed in one piece as a flexible body, which could be rubber-like or foam-like as well. The material of the upper cover 7 is preferably transparent. An also flexible, thin, printed electronic circuit board 3 with LED-s 4 made preferably with SMD sleeving fixed with soldering, or with adhesives- is placed between the lower 6 and upper cover 7. Soldering also ensures the electric connection of the LED-s 4 to the printed electronic circuit board 3. The device 1 is formed like a bracelet, which can be fastened to an arm or wrist. At the end of the device 1 velcros 5 are placed in the known way ensuring the fixing of the bracelet.

The battery house 9 is formed in the lower cover 6, which can be opened in given case partially or fully from the side, shaped to house the supply source 2, in given case the button cell, or button battery. In case of waterproof, water-tight embodiment, the side of the battery house 9 is closed with a closing cap, or closing element. The displacement

detector 10 as well as the flashing light unit 8 are situated above the battery house 9 which are fixed, respectively connected to the printed circuit board 3 from mechanical and electric consideration by soldering or with adhesives. The flashing light unit 8 in given case is a multivibrator formed on a microchip, provided with SMD sleeving and fixed on the printed circuit board 3 by soldering or adhesives.

The height of the side of the device 1 is given resulting from the size of the spare parts. The upper cover 7 is made also of a flexible material formed in one piece, which is partly or fully transparent or transparent only in the part above the LEDs 4. It ensures the proper visibility of the light of the LEDs 4. The switch K, which is preferably a SMD or traditional microswitch, is fixed on the printed circuit board 3 by soldering or by adhesives near the battery house 9 or above it.

The Fig 2 shows the top view of the device according to the invention with certain partial units and their layout. The device 1 formed as a strap, in an oblong form, can be seen in the drawing. The printed circuit board 3 with the LEDs 4 is located also lengthwise in it. The velcro 5 situated at one end of the device can be seen, furthermore the displacement detector 10 and the flashing light unit 8 which are located in the middle of the device 1 soldered on the printed circuit board 3. The battery house 9 housing the supply source 2 can be seen in the drawing depicted with a broken line, as well as the switch K.

The Fig 3 shows the electric block schematic of the device according to the invention with the electric partial units and their connections. The supply source 2 ensuring the supply voltage of the device 1 shown in the drawing, connecting to the flashing light unit 8 through the switch K and the displacement detector 10 can be seen in the drawing. Furthermore the LEDs 4 connected parallel with each other connecting to the outlet of the flashing light 8 can be seen in the drawing.

The device 1 can be changed to working condition by the closing of the switch K. Following this when signalling the direction, simultaneously with the start of the working of the device 1, the displacement detector 10 closes the circuit resulting from the proper tilting and resulting from this the flashing light unit 8 receives the supply voltage through the displacement detector 10. The LEDs 4 connecting to the outlet of the flashing light unit 8 start flashing.

Eliminating the tilting of the displacement detector 10, it breaks the circuit ensuring the supply voltage of the flashing light unit 8 resulting in the cease of the flashing of the flashing light unit 8 and the device 1 switches off.

Ending the functioning status of the device 1 takes place with the opening of the switch K. It could be necessary in case of delivery, or storage, or in certain traffic situations, where the flashing of the device 1 can disturb the other participants of the traffic. By closing the switch K the device 1 can be started to function again, and it can be used according to the rules by the the cyclist or motor-cyclist in the traffic.

The Fig 4 shows another possible realization of the device 1 according to the invention in outspread position, in top view. In case of the present realization the device 1 is

formed from flexible plastics, by injection molding in one or in more steps as one unit. The plastic arm strap 11 of the device 1 as well as the printed circuit board 3 placed in the plastic arm strap 11 can be seen in the drawing. The flashing light unit 8 and the displacement detector 10 were placed on the printed circuit board 3, as well as the LEDs 4 in equal distances on the printed circuit board 3. The battery house 9 with the supply source 2 placed in it can be seen in the drawing as well.

The L length of the plastic arm strap 11 of the device 1 was marked in the drawing, as well as the length L2 of the plastic arm strap 11, forming the thinner, more flexible parts of the plastic arm strap 11 curling to the wrist. Furthermore the length L1 of the plastic arm strap 11 situated above the plastic arm strap 11 was marked as well, being thicker, than length L1 housing the battery house 9. The full length L of the plastic arm strap 11 of the device 1 is  $L = L1 + L1 + L2$ .

Determination of the length of length L1 depends partly on the size of the battery house 9 to be placed on this part of the plastic arm strap 11. The determination of the length of length L2 depends on the diameter of the body part we want to place it on, respectively what size person wants to use it. Accordingly plastic arm straps 11 of different sizes should be produced. The length L1 fits the upper, straight part of the user's wrist. The length of the lengths L2 is determined considering the fact, that in case of different arm thicknesses, respectively in case of placing it on top of the clothing it can function easily.

The Fig 5 shows the device 1 according to Fig 4 in outspread position, in side view. The plastic arm strap 11 of the device 1 can be seen in the drawing, and the printed circuit board 3 placed in the plastic arm strap 11, this case situating in the center line of the thickness of the plastic arm strap 11. The flashing light unit 8 and the displacement detector 10 are placed on the printed circuit board 3, as well as the LEDs 4 are placed on the printed circuit board 3 in equal distances. The battery house 9 and the supply source 2 placed this case below the printed circuit board 3 can be seen in the drawing. It can be well seen in the drawing, that the battery house 9 is placed in the nest 13 formed in the plastic arm strap 11.

The battery house 9 was formed this case in such a way, that the waterproof closing of the supply source 2 housed in it is guaranteed. In case of this embodiment the supply source 2 can be placed into, respectively taken out of the battery house 9 from the side. The direction of the shrinking, bending of the plastic arm strap 11 was depicted by an arrow.

The Fig 6 shows the side view of an additional possible realization of the device 1 according to the invention. The plastic arm strap 11 of the device 1 is shown in the drawing with the battery house 9 in the nest 13 and the supply source 2 placed into it from a side direction. It can be well seen in the drawing, that in this case the printed circuit board 3 provided with the flashing light unit 8, the displacement detector 10 and the LEDs 4 is placed this case to the outer surface of the plastic arm strap 11. In this case the printed circuit board 3 was placed on the outer surface of the plastic arm strap 11 and it is provided with a covering layer 12 against outdoor effects.

The battery house 9 this case was also formed in such a way, that the waterproof closing of the supply source 2 placed inside is ensured. In case of this formation the supply source 2 can be placed into, respectively taken out of the battery house 9 from the side. The direction of the shrinking, bending of the plastic arm strap 11 was depicted by an arrow in the drawing.

The Fig 7 shows another possible realization of the bracelet according to the invention in side view. The drawing shows the plastic arm strap 11 of the device 1, the printed circuit board 3 with the flashing light unit 8, the displacement detector 10 and the LEDs 4 and this case it is fixed to the lower surface of the plastic arm strap 11 in such a way, that it matches with the outline of the nest 13 formed on the lower part of the plastic arm strap 11. The battery house 9 with the supply source 2 in it is fixed into the nest 13. This case the printed circuit board 3 is placed in the lower, inside part of the plastic arm strap 11 and it is provided from below with a covering layer 12 in order to protect it from outdoor effects.

The battery house 9 was formed this case also in such a way, that the waterproof closing of the supply source 2 placed in it is ensured. In case of this formation the supply source 2 can be placed into, respectively taken out of the battery house 9 from lateral direction. The direction of the shrinking, bending of the plastic arm strap 11 was depicted by an arrow in the drawing.

The Fig 8 shows the device 1 according to Fig 7 in open position. In order to keep the device 1 in this state, a smaller outer power effect is needed to overcome the power resulting from the flexibility of the material, distancing the outer lengths L2 of the plastic arm strap 11. In the open state of the device 1 the middle length L1 of the plastic arm strap 11 does not shrink, but remains straight resulting from the determination of the thickness of the plastic arm strap 11, whereas the outer lengths L2 parts start closing, curling due to the characteristics of the material. The direction of the shifting resulting from the flexibility of the material was depicted in the drawing by an arrow.

The Fig 9 shows the device 1 according to Fig 7 in closed position. It can be well seen in the drawing, that the device 1 is in half closed state. Resulting from the determination of the thickness of the plastic arm strap 11 made from special plastic, the middle length L1 of the plastic arm strap 11 does not shrink, but remains straight, however the outer lengths L2 curl up due to the characteristics of the raw material in such a way, that their ends are situated above each other. This solution makes it possible the use of the device 1 of the same size on body parts of different diameter, or in case of thicker clothing as well.

The Fig 10 shows the closed device 1 according to Fig 9 in top view. The plastic arm strap 11 of the device 1 can be seen in the drawing with the LEDs 4 placed on the printed circuit board 3, as well as the battery house 9 with the supply source 2.

The Fig 11 shows the closed device 1 according to Fig 9 in bottom view. The figure shows the plastic arm strap 11 of the device 1 with the LEDs 4 placed on the printed circuit board 3.

The possible concrete realization, use of the device 1 according to the invention:

The device 1 according to the invention is an independent unit. During the use of the device 1 the cyclist or motor-cyclist wears one on their both wrists and switches them on by turning of the arm when winding. It is not necessary to switch it off, because when the arm gets back to the original position, the movement triggers the switch off.

For the switching on of the device according to the invention only the turning of the wrist is necessary. Compared with the traditional devices with the drawback, that their recognition is limited from certain views, the device according to the invention, situated on the wrist flashes in 360° so it can be seen from every direction.

The person who wears the device 1 according to the invention moves their hand laterally when changing direction and turns their wrist moving their hand from the handlebars. Resulting from the turning of the wrist the device 1 switches on and gives flashes through the LEDs 4, similarly to the indicators of the other vehicles in the traffic. At the completing of the manoeuvre the user puts back their hand to the original position, and the device 1 becomes inactive again.

In a possible preferable realization of the solution according to the invention the displacement detector 10 is such a device, which gives impulse to start, respectively stop resulting from a definite movement, respectively from changing of an angle. This is a commercial product, which is available on the market. It is important the mechanical location, because that ensures, that switching on and off take place only resulting from the proper impulse. The displacement detector 10 in given case is an electronic device sensing tilting, working in such a way, that for example it switches on in case of an angular offset of 30-80 grades and works in the right as well as the left direction.

The displacement detector 10 can be in given case an electronic device functioning on the principle of a gyroscope, which is capable of sensing a 3D shifting. This is also a commercial product, that needs additional electronics. Though an alternative to the realization, but at present the price of the electronics limits the application.

The device 1 according to the invention is formed from a mechanical point of view as a bracelet placable on the arm or wrist, so it closes into itself mechanically. Method of closing is known, either by velcro, magnetic, or closing mechanically, by a ratchet mechanism. It must be placed in such a way, that it lies on the middle part of the hand, outwards, like a watch. The electronic units are placed on the printed circuit board 3 in the inside of the device 1, which are preferably SMD parts fixed on the surface.

The housing cover of the device 1 protects it from outside mechanical effects and makes it manageable for the average user and it also protects it from water, vapour and general mechanical effects occurring during use. It can be a cover made of silicon rubber, or of

plastic, or in given case a metal house, or the combination of the materials mentioned before. The cover should make possible the visibility of the flashes, it must be transparent at least where the flashing units, the LEDs 4 are. In case of a preferable concrete realization the whole device 1 is provided with a water-clear flexible plastic material, in given case made of acrylic or silicon and at the flashing units, the LEDs 4 preferable lense-like, convex, transparent parts are formed.

The device 1 in given case is a watch-like form, where the battery house 9 housing the battery or the supply source is placed in the watch-like unit. There are various alternatives for the formation of the battery house 9, respectively the placement of the supply source 2. The battery house 9 of the device 1 is suitable for housing a button cell or button battery.

In case of a possible concrete realization of the device 1 according to the invention it is produced as a bracelet fixable on the wrist in textile or synthetic rubber finish, into which a flexible printed circuit is integrated in such a way, that the displacement detector 10 is placed on the upper middle part of the wrist during use. The circuit runs along the full length of the device 1 formed as a wrist strap, ensuring this way, that the LEDs 4 placed a few centimeters from each other can be seen on the whole 360° circle. A transparent, waterclear, flexible silicon coating serves the waterproofness of the circuit and also protection against other mechanical effects. The device is provided with a button cell of 3 V, or a button battery to allow functioning with approximately 200 mAh output. A waterproof battery house 9, which can be opened to ensure exchanges is formed to house the supply source 2.

The switch K is used for switching on the device, which is a microswitch, provided with waterproofing. The SMD LEDs 4, the SMD displacement detector 10 and the SMD spare parts controlling the flashing are situated on the flexible printed circuit. The circuit is formed in such a way, that the LEDs 4 are in identical distance from each other, along the full length of the object. The displacement detector 10 serving as the novelty of the equipment, is positioned in the electronics in such a way, that it switches resulting from the proper angle shifting during functioning. This shifting of the angle occurs resulting in the lifting and turning of the hand from the handlebars, respectively the same effect occurs in reverse case. Consequently taking into consideration these factors it is very important where to put the spare part. The other SMD components for controlling the flashing, or in given case preventing the random false signals resulting from the shaking and other effects by switching on the flashing with a delay, are placed on the printed circuit board 3 between the LEDs 4.

The device 1 according to the invention can be fixed to the arm or wrist by velcro, or besides by a magnet, or by a snap fastener, or by a loose quick-fastening element. Depending on the use the product can be made in different sizes, for children and for adults.

In case of a preferable concrete realization of the device 1 according to the invention the lower cover 6 is made of leather or a fabric-like material, and it is flexible, in given case a complex of plastic or rubber connecting structurally, it is made by vulcanization in

such a way, that first a plastic or rubber layer is fixed to the fabric-like material by injection molding, or by adhesive, or by stitching and the upper cover 7 is connected to this ensemble.

In a further preferable embodiment the device 1 according to the invention is formed as one unit by casting or injection molding and/or adhesives.

In a possible further realization of the device 1 according to the invention, the production of the device 1 takes place such a way, that the printed circuit board 3 with the LEDs 4, and the flashing light unit 8 and the displacement detector 10 is placed in the material of the plastic arm strap 11 by a suitable technological process. In the lower part of the middle of the plastic arm strap 11 a nest 13 is formed for housing the battery house 9 with the supply source 2. The battery house 9 is fixed here in the known way.

In a further possible embodiment of the device 1 according to the invention the nest 13 is formed in the upper part of the middle of the plastic arm strap 11 providing place for the supply source 2 located in the battery house 9.

This case the exchange of the supply source 2 takes place in such a way, that a suitable opening is made on the side of the plastic arm strap 11 allowing the placing in and out of the supply source 2 laterally, preferably by applying waterproof closings. The printed circuit board 3 with the flashing light unit 8 and the displacement detector 10 and the LEDs 4 is placed on the outer surface of the plastic arm strap 11. This case the printed circuit board 3 is provided with a covering layer 12 for the sake of protecting it from outdoor effects.

In case of the solutions described above the material of the plastic arm strap 11 is such a special plastic, which has great flexibility, and does not lose flexibility during years. It results in the possibility, that determining the thickness of the material allows us to set the spring force of the material. As the material of the plastic arm strap 11 of the device 1 a transparent, translucent version of the special plastic described above is used, so it becomes possible for the light of the LED 4 placed into the plastic arm strap 11 itself to penetrate the material of the plastic arm strap 11.

In case of a further preferable, concrete formation the device 1 is made of flexible plastic by injection molding in one or more steps and it is formed as one unit. The length L of the plastic arm strap 11 of the device 1 is in given case 180-320 mm, the length of the length L1 is 30-50 mm. The material of the covering layer 12 is plastic, identical with the own material of the device 1, or any other waterclear plastic.

Choosing the length of the length L1 partly depends on the size of the battery house 9 to be placed on this part of the plastic arm strap 11. Choosing of the length of the length L2 depends on the diameter of the body part to be put on, respectively on the size of the person. Accordingly it is preferable to produce different sizes of plastic arm straps 11. The length L1 fits to the upper, straight part of the user's wrist. The length of the

lengths L2 is chosen in such a way, that in case of different arm thicknesses or placing on the clothing the device 1 can function.

The device 1 according to the invention is in given case provided with such an inside timer, that ensures, that functioning stops after a certain time following switching on. It prevents unnecessary continuous functioning and the supply source 2 becoming flat.

The advantage of the solution according to the invention is, that in the dark, respectively under poor visibility the cyclists, respectively the motor-cyclists can indicate direction when winding. It improves safety both for the cyclist and the motor-cyclist, as well as for the other participants of the traffic. It decreases to a great extent the probability of accidents resulting from winding.

The device according to the invention has an independent power source, it can signal in every direction with great light force, its switching on takes place almost instinctively, without distracting the attention of the driver. All this is granted with a small weight, in waterproof finish ensuring the proper positioning of the displacement detector.

An additional benefit, that its use is easy, it is suitable for both grown-ups and children in different sizes. Its shape is simple, production is cost-efficient, so it can be widespread used.

An additional advantage of the device according to the invention made of flexible plastic, that it can be fixed on the wrist or taken off the wrist without an additional closing element. It makes the use easy to a great extent. The positioning on the wrist takes place automatically after putting on, it does not need additional movement. From production point of view it is also easier, because it can be produced in a few steps with a simple technological procedure.

List of references:

- 1 – device
- 2 – supply source
- 3 – printed circuit board
- 4 – LED
- 5 – velcro
- 6 – lower cover
- 7 – upper cover
- 8 – flashing light unit
- 9 – battery house
- 10 – displacement detector
- 11 – plastic arm strap
- 12 – covering layer
- 13 – nest

- K – switch
- L – length
- L1 – length L1
- L2 – length L2

**CLAIMS:**

1. Driving indicator with LED integrated in bracelet for cyclists and motor-cyclists, which is fixable on the arm or wrist, and there are light-emitting LEDs in its cover connecting from an electrical view to a flashing unit,

characterized by that,

a flexible, thin, printed electronic circuit board (3) with LEDs (4) fixed with soldering, or with adhesives, is placed between the lower cover (6) and upper cover (7) of a device (1) formed as a bracelet fixable to the arm, or the wrist, made of flexible material, consisting of an oblong lower cover (6) and an oblong upper cover (7), also made of a flexible material and the covers are built together,

furthermore in the middle of the lower cover (6) a battery house (9) suitable for housing of supply source (2) in given case a button cell, or button dry battery, and above said battery house (9) there is a displacement detector (10) perceiving the shift, as well as flashing light unit (8) are situated, from mechanical and electric aspect fixed, respectively connected to the printed circuit board (3) by soldering, or with adhesive.

2. Device according to claim 1 characterized by that, at the ends of the device (1) there are velcros (5) placed in the known way, and their joining together ensures the bracelet-like fixing.

3. Device according to claim 1 or 2 characterized by that, the lower cover (6) is formed from leather or a fabric-like material.

4. Device according to any of claim 1 or 2 characterized by that, the lower cover (6) is formed in one piece from a flexible material, in given case from plastic or rubber, and in given case it is of spongy structure.

5. Device according to any of claim 1-4 characterized by that, the lower cover (6) is leather, or a fabric-like material, as well as a flexible material, in given case an ensemble of plastic or rubber structurally connecting with each other.

6. Device according to any of claim 1-5 characterized by that, the upper cover (7) is formed in one piece, from a flexible material, in given case from plastic or rubber, and is transparent as a whole, or in the part above the LEDs (4).

7. Device according to any of claim 1-6 characterized by that, the device (1) is made of flexible plastic by casting or by injection molding in one or more steps, formed as a single unit.

8. Device according to any of claim 1-7 characterized by that, the supply source (2) ensuring the supply voltage of the device (1) is connected to the flashing light unit (8) through a swith (K), in given case through an SMD microswitch and through the displacement detector (10).

9. Device according to any of claim 1-8 characterized by that, the flashing light unit (8) and the displacement detector (10) are spare parts fixed with SMD sleeving, furthermore the flashing light unit (8) is in given case a multivibrator formed on an integrating circuit chip.

10. Device according to any of claim 1-9 characterized by that, the displacement detector (10) is in given case an electronic device functioning on the principle of a bank-and-turn indicator or a gyroscope, or an accelerometer.

11. Device according to any of claim 1-10 characterized by that, the LEDs (4) are connected parallel with each other to the output terminal of the flashing light unit (8).

12. Device according to any of claim 1-11 characterized by that, the battery house (9) housing the supply source (2) in given case can be laterally opened partly, or wholly, and is preferably closed with a closing plate or cover.

13. Device according to any of claim 1-12 characterized by that, the printed circuit board (3) is situated in the plastic arm strap (11), in the central line of the thickness of the plastic arm strap (11), and the battery house (9) housing the supply source (2) is placed below the printed circuit board (3).

14. Device according to any of claim 1-13 characterized by that, the printed circuit board (3) is situated on the upper part of the plastic arm strap (11) of the device (1), in given case fixed to it by adhesive, and is provided from the upper part by an additional covering layer (12), and the battery house (9) housing the supply source (2) is placed below the printed circuit board (3) in the nest (13) formed in the plastic arm strap (11).

15. Device according to any of claim 1-13 characterized by that, the printed circuit board (3) is situated on the lower part of the plastic arm strap (11) of the device (1), in given case fixed to it by adhesive and is provided from below with an additional covering layer (12), and the battery house (9) housing the supply source (2) is placed below the printed circuit board (3) in the nest (13) formed in the plastic arm strap (11).

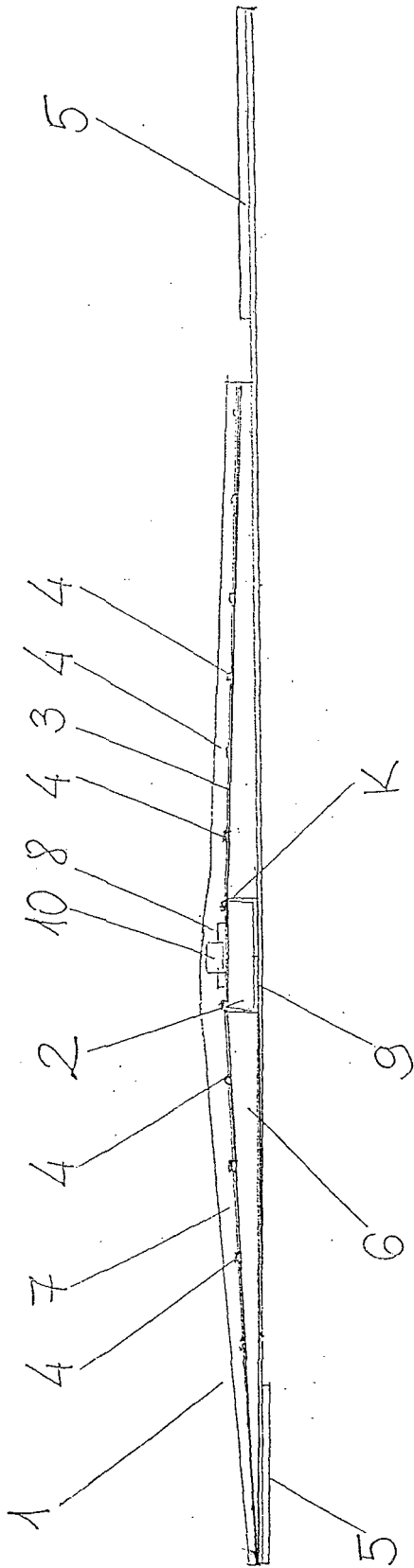


FIG. 1

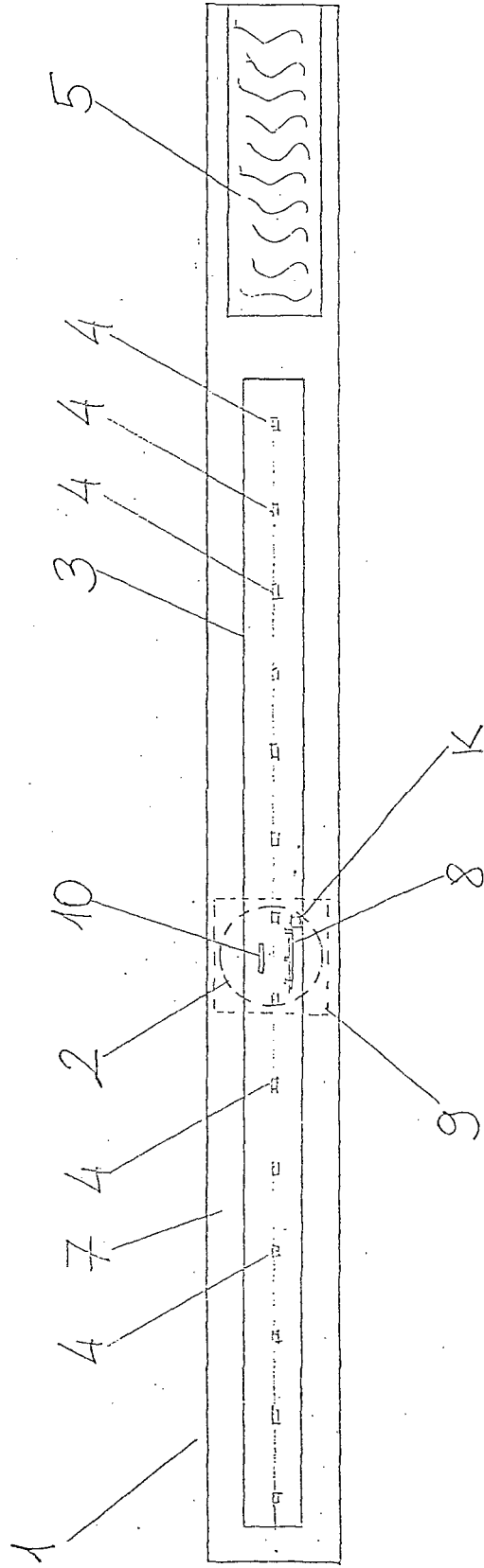


FIG. 2

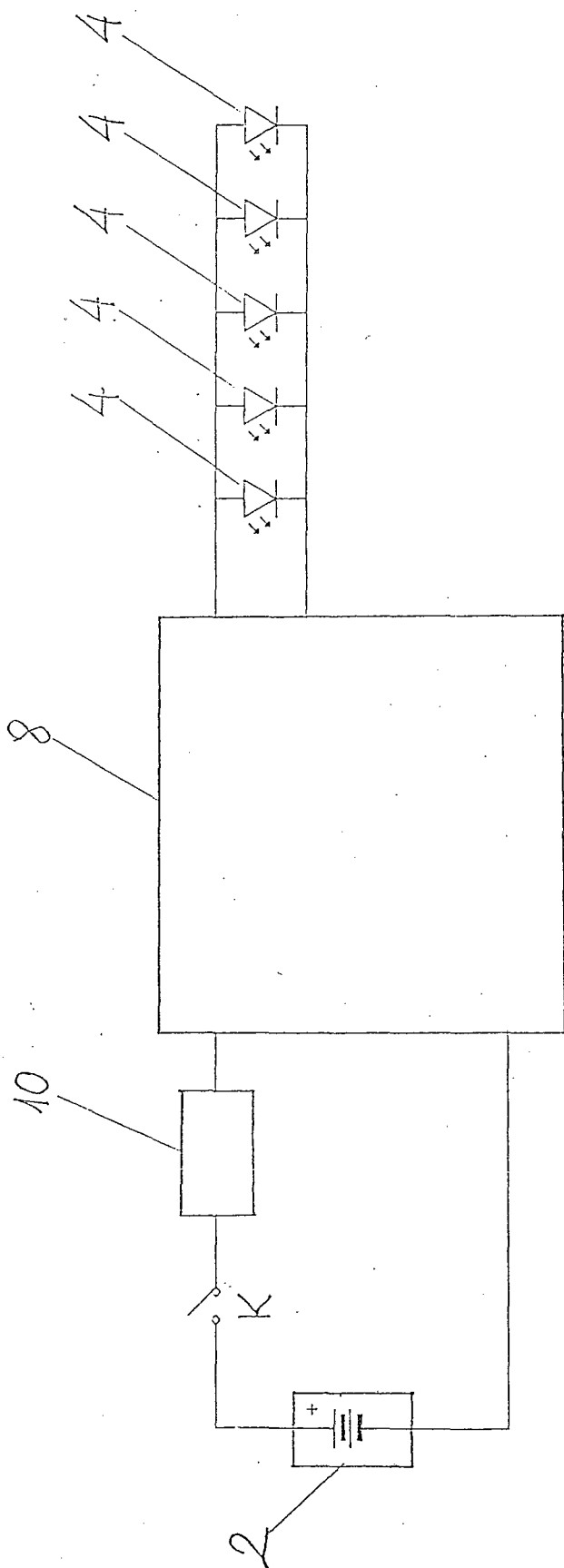


FIG. 3

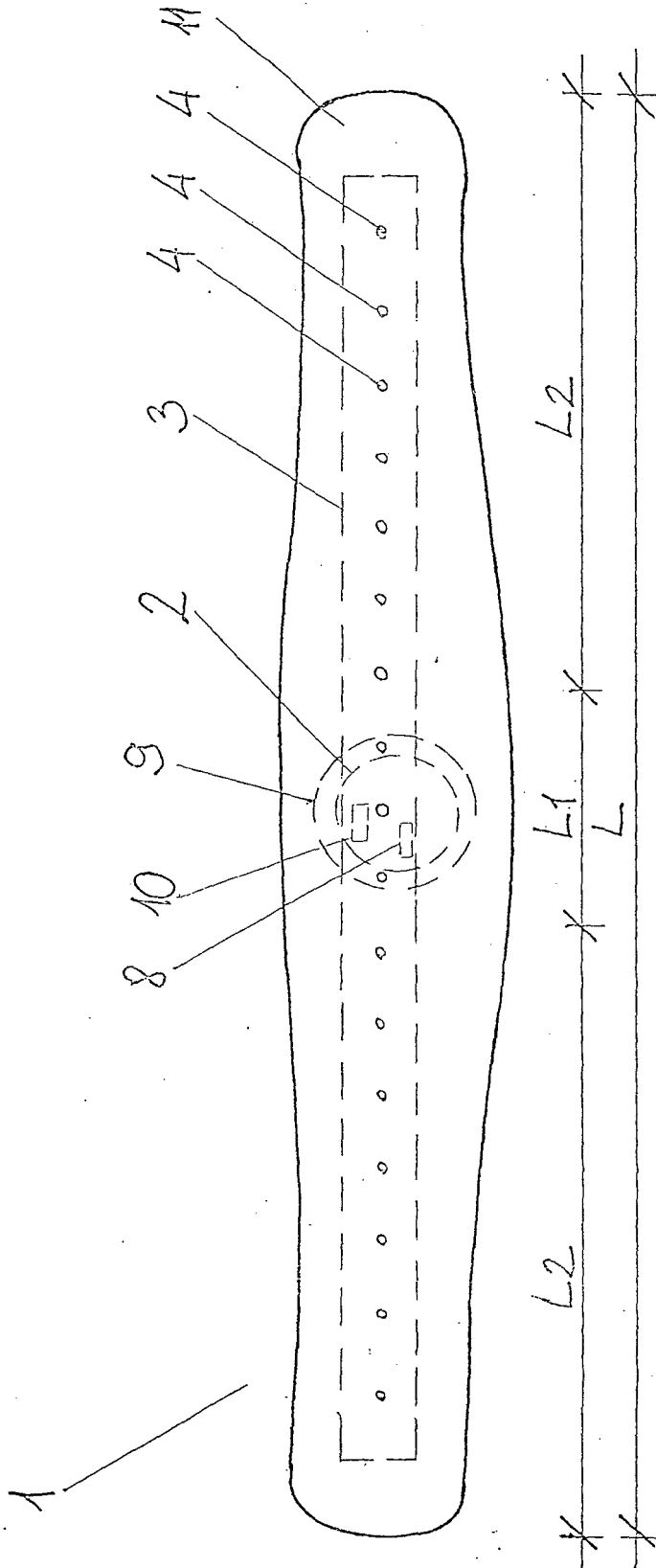


FIG. 4

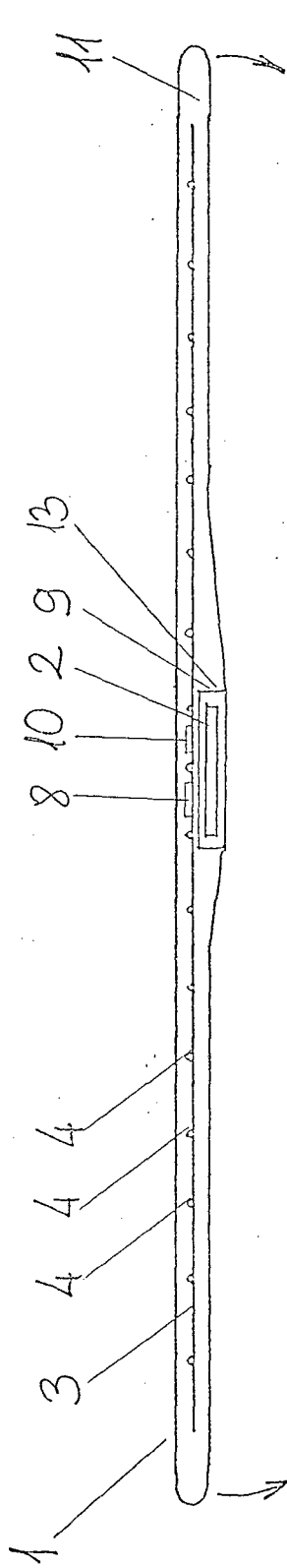


FIG. 5

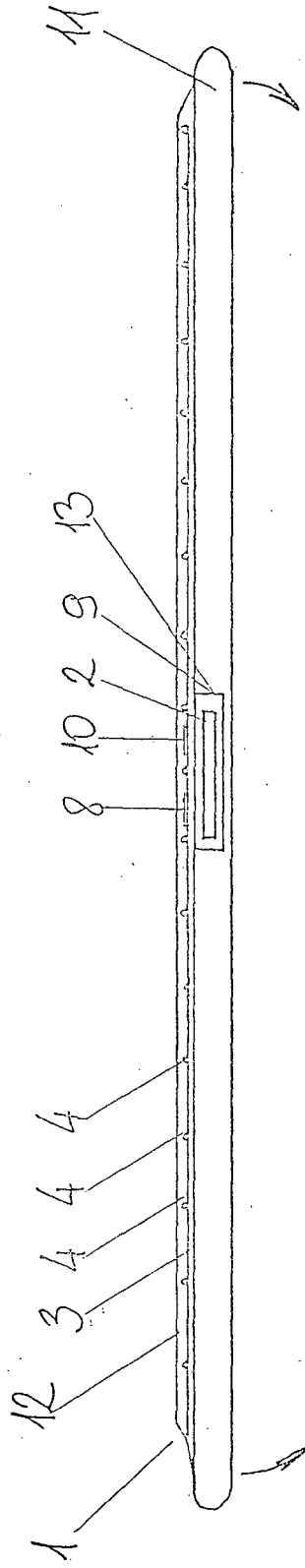


FIG. 6

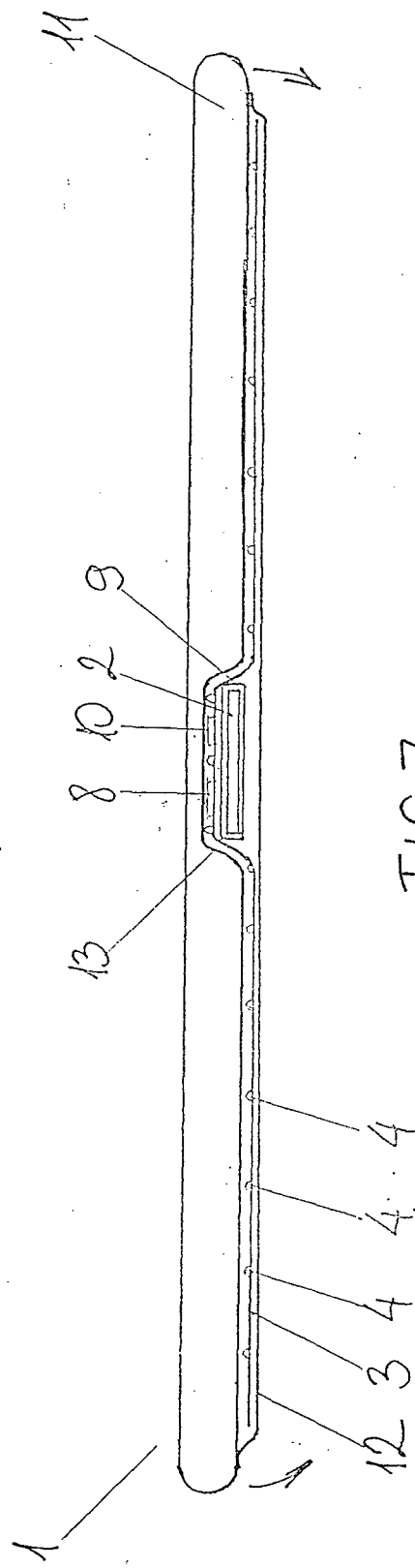


FIG. 7

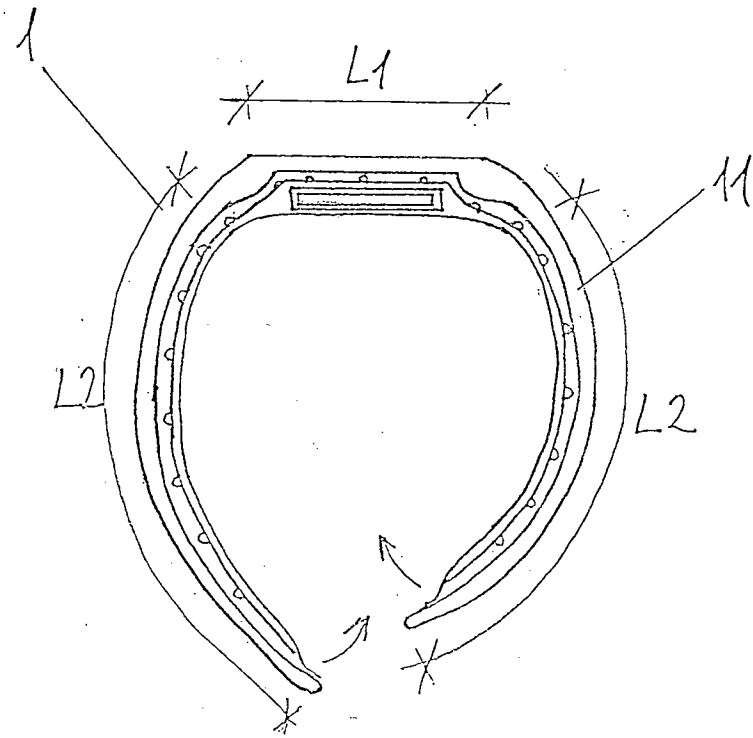


FIG. 8

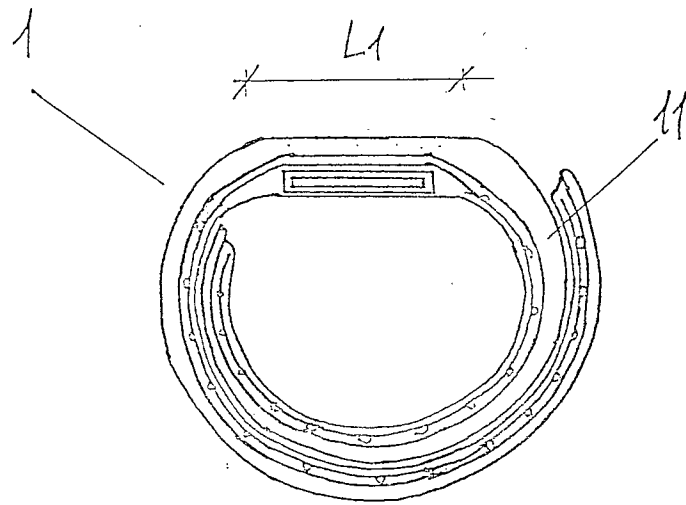


FIG. 9

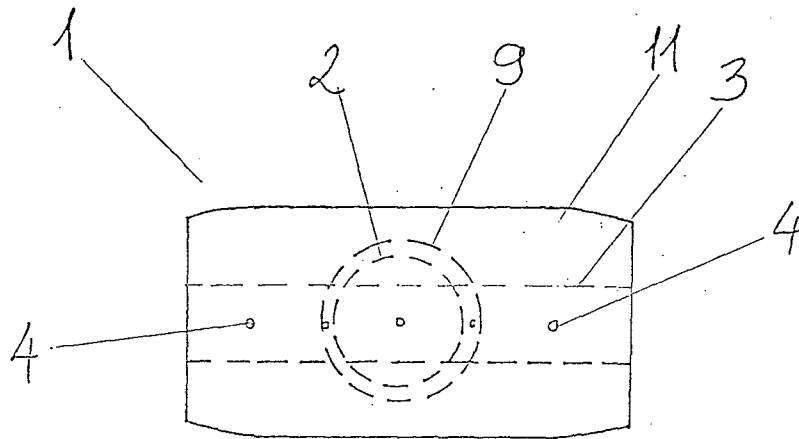


FIG. 10

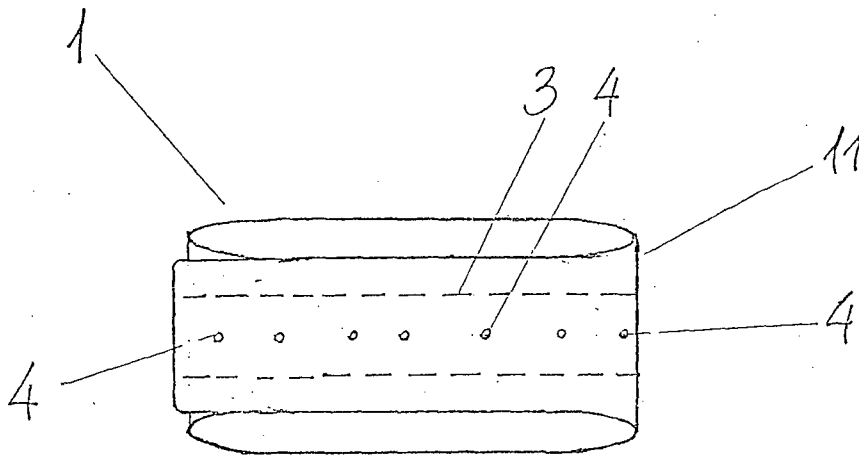


FIG. 11