

(19)



(11)

EP 2 614 737 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.07.2013 Bulletin 2013/29

(51) Int Cl.:
A42B 3/04 (2006.01) A42B 3/14 (2006.01)

(21) Application number: **12150568.9**

(22) Date of filing: **10.01.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventor: **Fang, Kuo Yun**
114 Neihu Dist., Taipei City (TW)

(74) Representative: **2K Patentanwälte Blasberg Kewitz & Reichel Partnerschaft**
Schumannstrasse 27
60325 Frankfurt am Main (DE)

(71) Applicant: **Fang, Kuo Yun**
Taipei City 114 (TW)

(54) **Adjustable cap strip with light emitting module**

(57) An adjustable cap strip with a light emitting module installed on a bicycle safety cap of the invention comprises a base (10), a strip body (20) and a light emitting module (30), and the base (10) has a containing space (11) and a through slot (12) interconnected with the containing space (11), and a long slot (21) is formed separately at both ends of the strip body (20), and a rack (22) is formed at an inner edge of each long slot (21), and the through slots (12) are stacked with one another in the containing space (11), and the light emitting module (30)

includes a knob assembly (31) and a light emitting unit (32) coupled to the knob assembly (31), and the knob assembly (31) includes a knob (311), a shaft (3113) extended from the knob (311) and pivotally coupled to the base (10) and at a position corresponding to the containing space (11), and a gear (15) is driven and rotated by the knob (311), passed into each long slot (21), and engaged and transmitted with each rack (22), so as to achieve the effect of adjusting the size of the bicycle safety cap and the brightness of the light emitting module (30) for reminding and warning cars coming from behind.

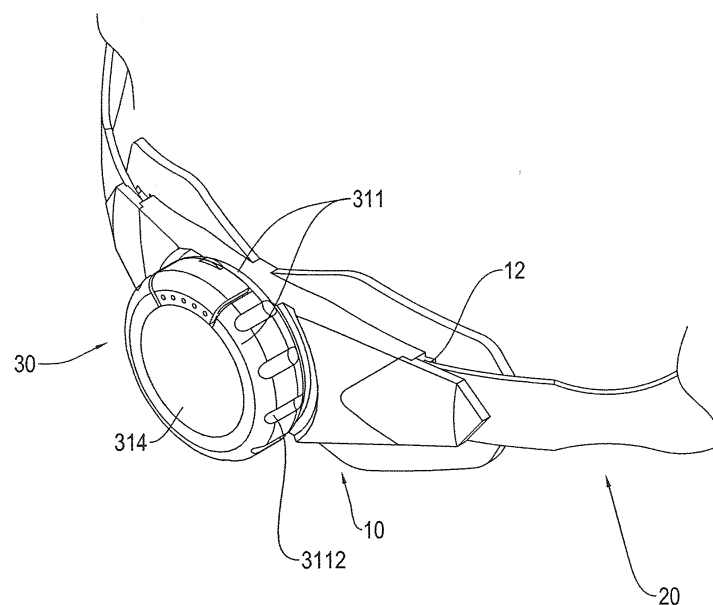


FIG.1

EP 2 614 737 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a cap strip of a safety cap, in particular to an adjustable cap strip with a light emitting module.

BACKGROUND OF THE INVENTION

[0002] At present, people pays more attention to their health than ever, and riding bicycle becomes one of the popular fitness sports, and activities such as fixed-point or around-the-island bicycling tours are promoted and developed rapidly. However, riders ride their bicycles very fast in some of the bicycle activities, and accidents may occur once the bicycle is toppled over and the riders may fall and hit their head, or the vision is relatively poor when the riders ride at night. The bicycle rider may not pay enough attention to the road condition in the front and hit other bicycles or motor vehicles, and injuries may occur. Therefore, bicycle riders start wearing bicycle helmet. However, the conventional bicycle helmet only comes with a cap strip fastened at the lower chin of the rider. Since the size of the riders' heads is different, and it is difficult to find a perfect match of the right-sized helmet, therefore an adjustable cap strip is added to the bicycle helmet for adjusting the head size of the bicycle helmet. However, riders riding at night still have the aforementioned risk, and thus it is a main subject of the present invention to overcome the foregoing problems.

[0003] The conventional adjustable cap strip comprises a base, a strip body and a knob assembly, wherein the base has a containing groove formed at the middle and a through slot formed separately at both ends and interconnected with the containing groove, and a long slot with a rack is disposed separately at both ends of the strip body and passed through the through slots at both ends of the base and stacked with one another in the containing space. The knob assembly has a gear installed at an end of the knob assembly, wherein an end of the knob assembly having the gear installed at the base is contained in the containing space, such that the gear can be passed and installed into each long slot and engaged and transmitted with the rack, so that the knob assembly can be rotated to adjust the length of the strip body to achieve the function of adjusting the head size of the bicycle helmet.

[0004] Although the conventional adjustable cap strip has the function of adjusting the head size of the bicycle helmet, yet it still has the following drawbacks. Since the bicycle helmet does not emit light, therefore when a rider rides at night time, the rider still has the risk of being hit by other bicycles or motor vehicles coming from behind due to the low visibility at night. Obviously, the prior art requires further improvements.

SUMMARY OF THE INVENTION

[0005] Therefore, it is a primary objective of the present invention to provide an adjustable cap strip with a light emitting module, wherein a light emitting unit is installed at an end of a knob assembly to form a light emitting module, so that a safety cap can emit light at night time to remind and warn cars coming from behind.

[0006] To achieve the aforementioned objective, the present invention provides an adjustable cap strip with a light emitting module, comprising a base, a strip body and a light emitting module, wherein the base has a containing space and a through slot interconnected with the containing space, and a long slot is formed separately at both ends of the strip body, and a rack is formed at an inner edge of each long slot, and the through slots are stacked with one another in the containing space, and the light emitting module includes a knob assembly and a light emitting unit coupled to the knob assembly, and the knob assembly includes a knob, a shaft extended from the knob and pivotally coupled to the base at a position corresponding to the containing space, and a gear is driven and rotated by the knob, passed into each long slot, and engaged and transmitted with each of the racks.

[0007] In addition, the present invention further has the effect of changing batteries when the battery power is low or exhausted by covering the upper cover plate onto the case cover, and the light emitting unit in the light emitting module is a light source of light emitting diodes, so that the power consumption is very small, and an excellent power saving effect can be achieved. In addition, there is no need to replace the battery frequently, and thus avoiding unnecessary waste of resources.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective view of an adjustable cap strip of the present invention;

[0009] FIG. 2 is an exploded view of an adjustable cap strip of the present invention;

[0010] FIG. 3 is another exploded view of an adjustable cap strip of the present invention;

[0011] FIG. 4 is an exploded view of a light emitting module of the present invention;

[0012] FIG. 5 is another exploded view of a light emitting module of the present invention;

[0013] FIG. 6 is a first schematic view of using an adjustable cap strip of the present invention;

[0014] FIG. 7 is a second schematic view of using an adjustable cap strip of the present invention; and

[0015] FIG. 8 is a schematic view of applying the present invention to a safety cap.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The technical characteristics and contents of the present invention will become apparent with the fol-

lowing detailed description and related drawings. The drawings are provided for the purpose of illustrating the present invention only, but not intended for limiting the scope of the invention.

[0017] With reference to FIG. 1 for a perspective view of adjustable cap strip with a light emitting module in accordance with the present invention, the adjustable cap strip with a light emitting module 1 comprises a base 10, a strip body 20 and a light emitting module 30.

[0018] With reference to FIGS. 2 and 3 for exploded views of an adjustable cap strip of the present invention respectively, the base 10 is similar to a rectangular object having a containing space 11 formed on a distal surface and a through slot 12 formed separately at both lateral ends and interconnected with the containing space 11. The base 10 includes a base plate 13 disposed at a position corresponding to the containing space 11, a cylindrical column 14 extended in a direction from the base plate 13 to the containing space 11, and a circular gear 15 installed at the base 10 and corresponding to the periphery of the top of the containing space 11 and having a plurality of ratchet teeth 16.

[0019] The strip body 20 is made of rubber or plastic, and the strip body 20 can be integrally formed or formed by combining two or more strips, and a long slot 21 is formed separately at both ends of the strip body 20, and a rack 22 is formed at an inner edge of each long slot 21, and both ends of the strip body 20 are passed and coupled into each through slot 12 and stacked with one another in the containing space 11.

[0020] With reference to FIGS. 4 and 5 for exploded views of a light emitting module of the present invention respectively, the light emitting module 30 comprises a knob assembly 31, and a light emitting unit 32 and a control assembly 33 coupled to the knob assembly 31. The knob assembly 31 includes a knob 311, a gear 312, a ratchet 313 and an upper cover plate 314. The knob 311 includes a lower case base 3111 and a case cover 3112, and a shaft 3113 is extended from the lower case base 3111, and the shaft 3113 at a corresponding position of containing space 11 is pivotally coupled to the cylindrical column 14, and an inner hole 3114 is formed inside the shaft 3113. An end of the gear 312 is coupled to an end of the ratchet 313, and a through hole 3121 is formed between the gear 312 and the ratchet 313 and penetrated through the gear 312 and the ratchet 313. The cylindrical column 14 of the base 10 is pivotally coupled to the through hole 3121, such that the gear 312 and the ratchet 313 are pivotally coupled to the cylindrical column 14 of the base 10. The ratchet 313 is comprised of three petal-shaped elastic arms 3131, and a claw 3132 is protruded from an outer periphery of each petal-shaped elastic arm 3131, and each claw 3132 is latched and fixed to the ratchet teeth 16 of the circular gear 15, such that the ratchet 313 and the circular gear 15 are latched and fixed with each other, and a through groove 3133 is formed in each petal-shaped elastic arm 3131 of the ratchet 313, and three protruding pillars 3114 are

extended from the lower case base 3111 towards the containing space 11 and passed and installed into the through groove 3133 of the petal-shaped elastic arm 3131. The gear 312 is contained into the containing space 11 of the base 10 and passed and installed in each long slot 21 of the strip body 20 and engaged and transmitted with each of the racks 22. The case cover 3112 is a transparent or semi-transparent casing, and a containing groove 3115 is formed in the case cover 3112 and penetrated through the case cover 3112. A hollow cone 3116 is formed and extended from an end of the lower case base 3111 away from the ratchet 313 and passed into the containing groove 3115 of the case cover 3112 so as to form another disposing groove (not shown in the figure).

[0021] The control assembly 33 includes a circuit board 331 and a battery 332, wherein a control circuit is printed at an end of the circuit board 331, and the other end of the circuit board 331 is coupled to an end of the battery 332, and a lateral end of the circuit board 331 is coupled to the light emitting unit 32, such that the circuit board 331 is electrically coupled to the battery 332 and the light emitting unit 32, and the light emitting unit 32 is a light emitting diode (LED), and the control assembly 33 is contained in the disposing groove 3117. In addition, the case cover 3112 has a notch 3118 for embedding and installing the light emitting unit 32 therein, and an upper cover plate 314 is covered and coupled to the case cover 3112 and installed at a position corresponding to the light emitting unit 32.

[0022] In summation of the aforementioned technologies, when the adjustable cap strip with a light emitting module 1 is installed, both ends of the long slot 21 of the strip body 20 are passed and assembled in the containing space 11 of the base 10, so that the base 10 and the strip body 20 are integrally assembled. During the process of assembling the light emitting module 30 and the base 10 and strip body 20 together, the light emitting module 30 is assembled by integrating the lower case base 332 with the case cover 331 first, and then the control assembly 33 is contained in the disposing groove 3117. The upper cover plate 314 is covered onto the case cover 3112, and the control assembly 33 is wrapped into the knob assembly 31, and the gear 312 and the ratchet 313 are passed and installed to the cylindrical column 14 of the base 10, so that the gear 312 is contained and installed in the containing space 11. The gear 312 is passed and installed in each long slot 21 of the strip body 20 and engaged and transmitted with each of the racks 22. The ratchet 313 and the circular gear 15 of the base 10 are latched and fixed with each other, and finally a locking element 40 is passed and coupled to the interior of the cylindrical column 14 of the base 10 and the inner hole 3114 of the lower case base 3111 to secure the base 10 with the light emitting module 30.

[0023] With reference to FIGS. 6 and 7 for schematic views of using an adjustable cap strip of the present invention respectively, when the knob assembly 31 of the

light emitting module 30 is rotated, the internal gear 36 and the rack 22 in the strip body 20 are engaged and transmitted to achieve the effect of adjusting the length of the strip body 20.

[0024] With reference to FIG. 8 for a schematic view of applying the present invention to a safety cap, when the upper cover plate 314 is pressed, the circuit board 331 installed in the light emitting module 30 drives the electric power of the battery 332 to be transmitted into the light emitting unit 32, so that the light emitting unit 32 can emit light. Since the case cover 3112 is a transparent or semi-transparent casing, therefore when the light emitting unit 32 emits light, the light can be seen from the exterior of the case cover 3112. When the adjustable cap strip with a light emitting module 1 is installed onto the bicycle helmet, the present invention not only adjusts the length of the cap strip 20, but also allows riders to press the upper cover plate 314 to emit light from the light emitting unit 321, so as to prevent the bicycle rider from being hit from other bicycles or motor vehicles coming from behind due to the poor vision at night.

Claims

1. An adjustable cap strip with a light emitting module, comprising:

a base (10), having a containing space (11) and a through slot (12) interconnected to the containing space (11);

a strip body (20), having a long slot (21) separately formed at both ends of the strip body (20), and a rack (22) formed at an inner edge of each of the long slots (21), and both ends of the strip body (20) passing and coupling each of the through slots (21) respectively and being stacked with one another in the containing space (11); and

a light emitting module (30), including a knob assembly (31) and a light emitting unit (32) coupled to the knob assembly (31), and the knob assembly (31) including a knob (311), a shaft (3113) extended from the knob (311) and pivotally coupled to the base (10) and at a position corresponding to the containing space (11), and a gear (312) driven and rotated by the knob (311), and passed into each of the long slots (21) to engage and transmit with each of the racks (22).

2. The adjustable cap strip with a light emitting module as claimed in claim 1, wherein the base (10) includes a base plate (13) disposed at a position corresponding to the containing space (11), and a cylindrical column (14) extended from the base plate (13), and the shaft (3113) of the knob assembly (31) is passed and pivotally coupled to the cylindrical column (14).

3. The adjustable cap strip with a light emitting module as claimed in claim 2, wherein the base (10) includes a circular gear (15) formed around the periphery of the containing space (11), and the knob assembly (31) further includes a ratchet (313) fixed to and rotated with the gear (312), and latched and positioned with the circular gear (15).

4. The adjustable cap strip with a light emitting module as claimed in claim 3, wherein the ratchet (313) is comprised of three petal-shaped elastic arms (3131) and a claw (3132) protruded from an external periphery of each of the petal-shaped elastic arms (3131), and the circular gear (15) includes a plurality of ratchet teeth (16), and each of the claws (3132) is latched with the ratchet teeth (16).

5. The adjustable cap strip with a light emitting module as claimed in claim 4, wherein the knob (311) includes a plurality of protruding pillars (3114) extended from a distal surface of the knob (311), and each of the petal-shaped elastic arms (3131) includes a through groove (3133) formed therein, and each of the protruding pillars (3114) is passed and coupled to each of the respective through grooves (3133).

6. The adjustable cap strip with a light emitting module as claimed in any of the preceding claims, wherein the light emitting module (30) further includes a control assembly (33), and the knob (311) includes a lower case base (3111) and a case cover (3112) coupled to the lower case base (3111), and a disposing groove (3117) is formed between the case cover (3112) and the lower case base (3111) for installing the control assembly (33).

7. The adjustable cap strip with a light emitting module as claimed in claim 6, wherein the control assembly (33) includes a circuit board (331) and a battery (332), and the circuit board (331) is electrically coupled to the battery (332) and the light emitting unit (32).

8. The adjustable cap strip with a light emitting module as claimed in claim 6 or 7, wherein the case cover (3112) includes a notch (3118) for embedding and containing the light emitting unit (32).

9. The adjustable cap strip with a light emitting module as claimed in claim 8, wherein the knob (311) further includes an upper cover plate (314) coupled to the case cover (3112) and installed at a position corresponding to the light emitting unit (32).

10. The adjustable cap strip with a light emitting module as claimed in any of claims 6 to 9, wherein the case cover (3112) is a light transmitting element.

11. The adjustable cap strip with a light emitting module as claimed in any of claim 6 to 9, wherein the case cover (3112) is a semi light transmitting element.

12. The adjustable cap strip with a light emitting module as claimed in any of the preceding claims, wherein the light emitting unit (32) is a light emitting diode (LED).

10

15

20

25

30

35

40

45

50

55

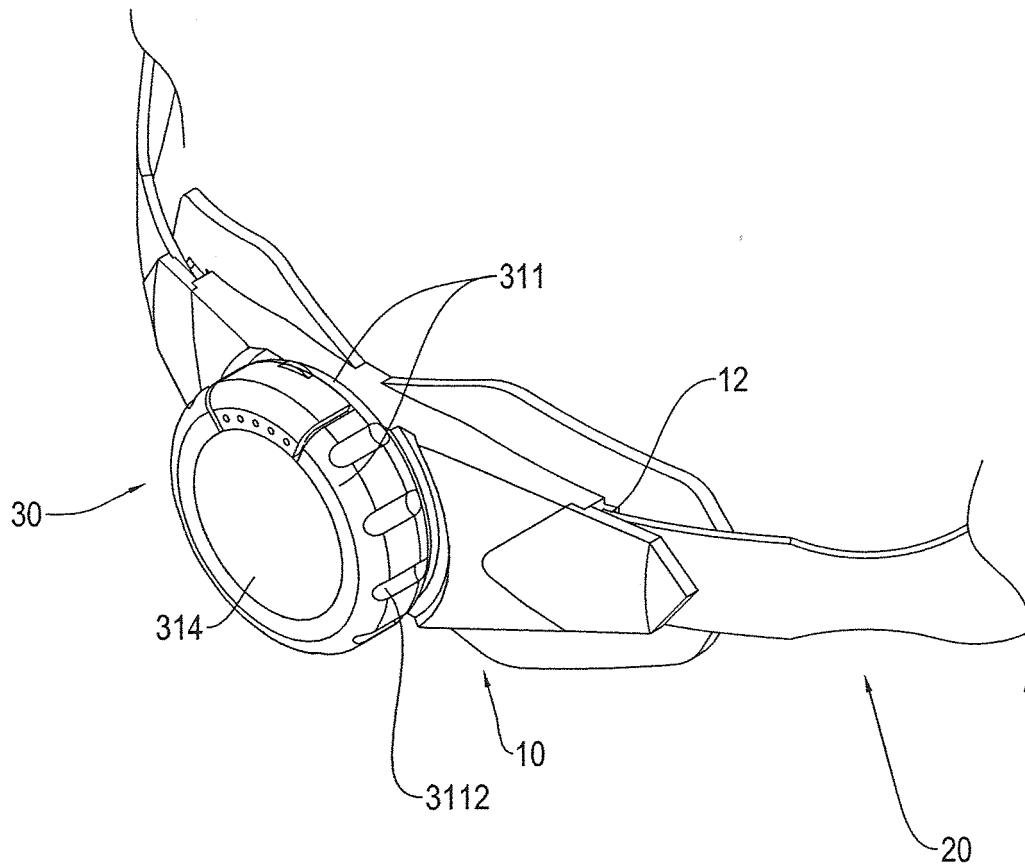


FIG.1

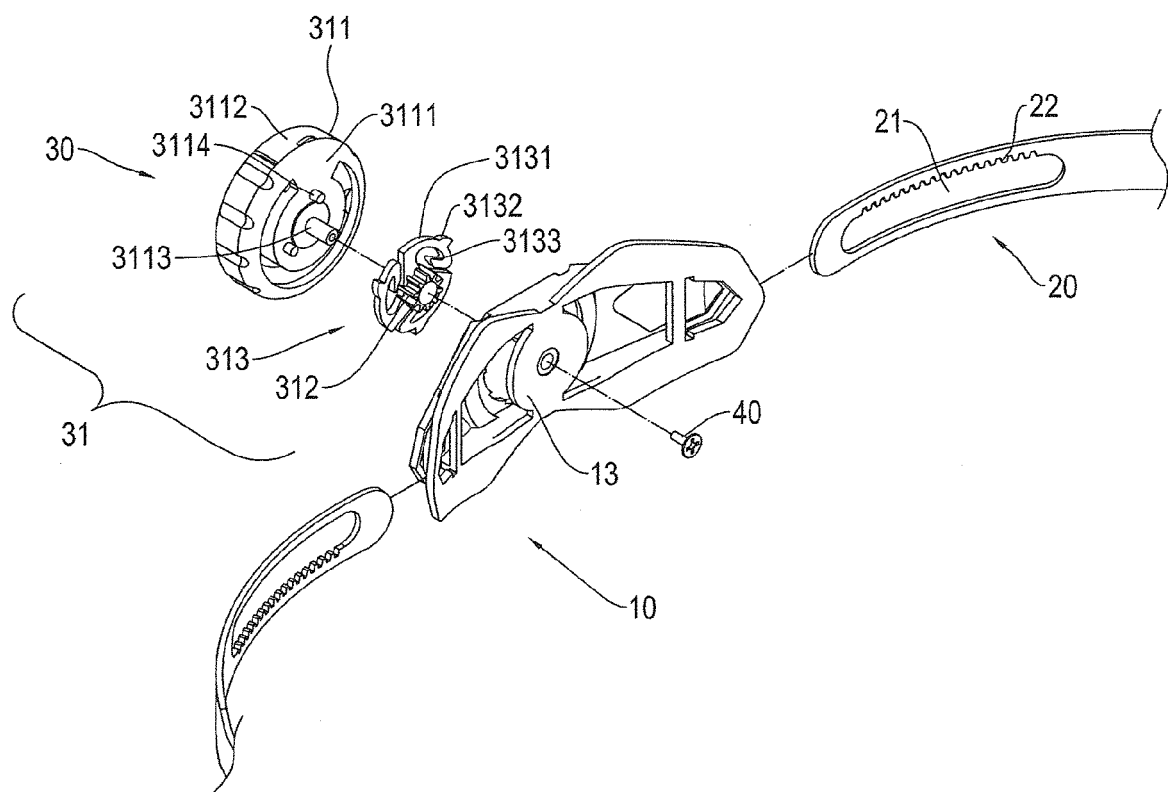


FIG.2

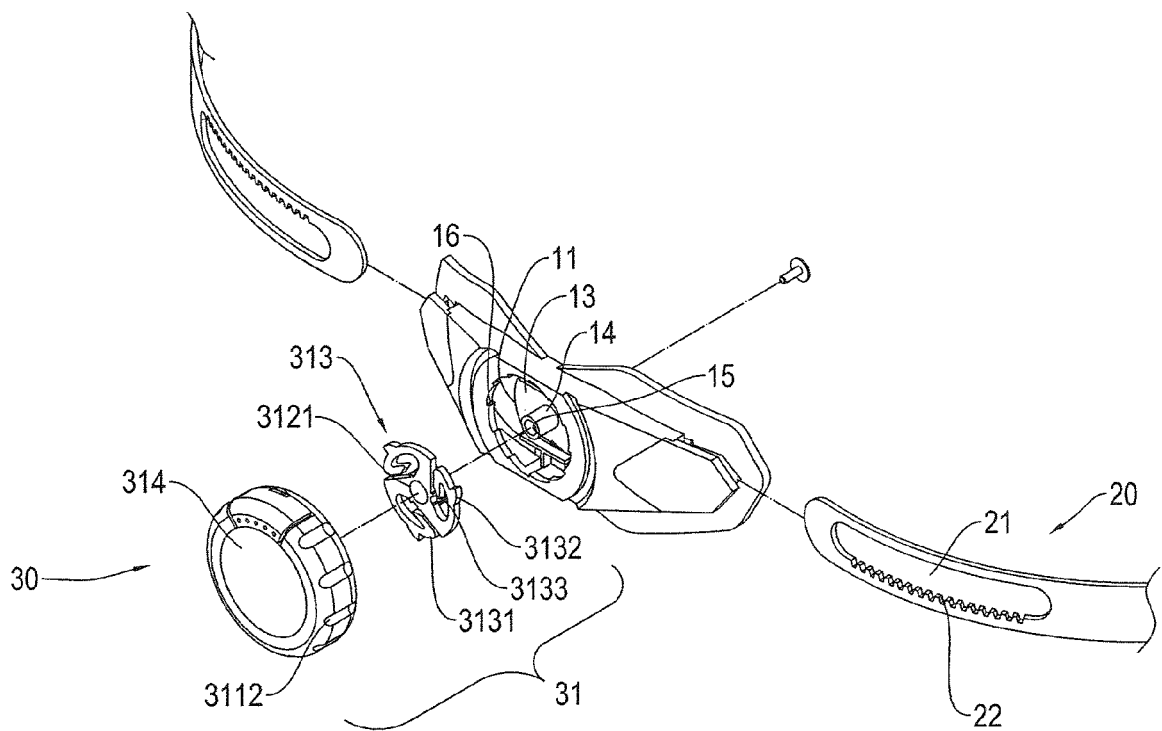


FIG.3

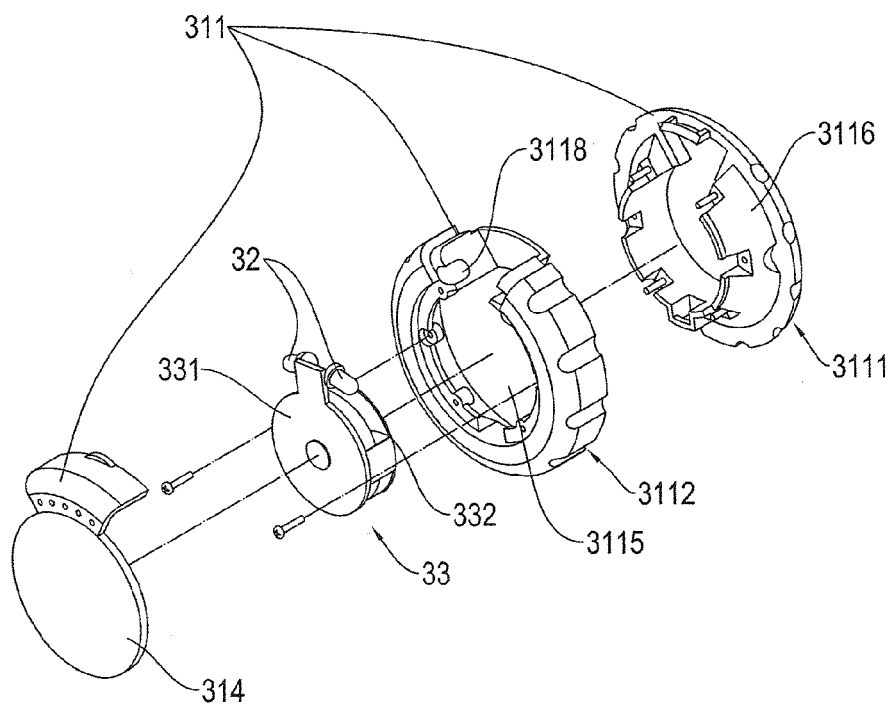


FIG.4

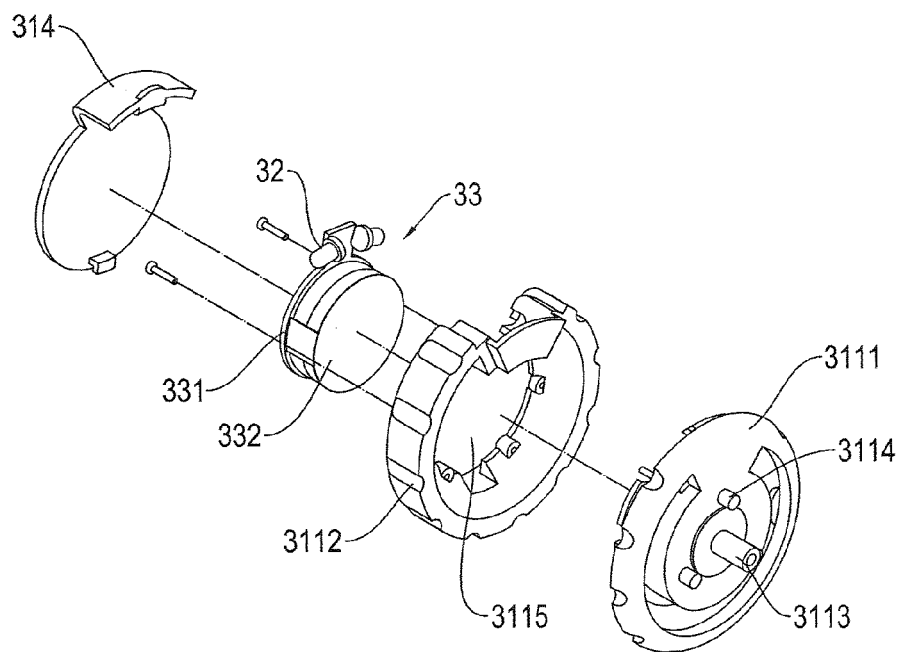


FIG.5

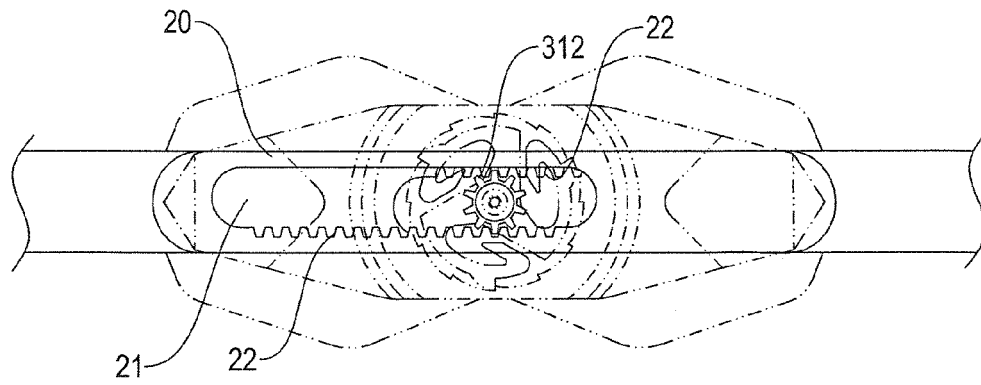


FIG. 6

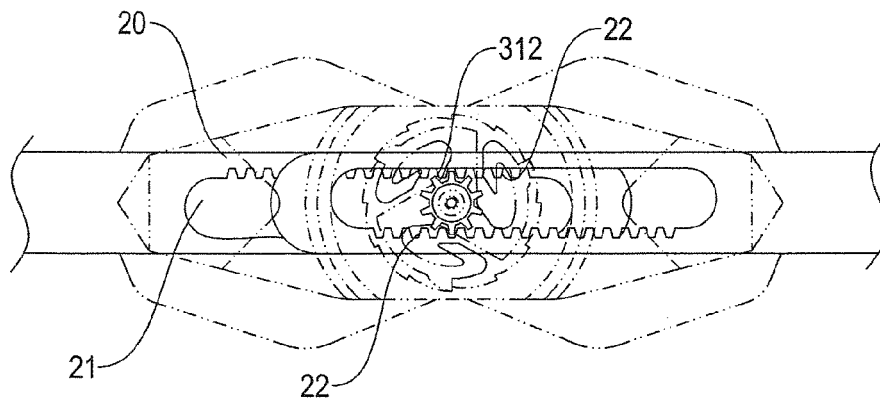


FIG. 7

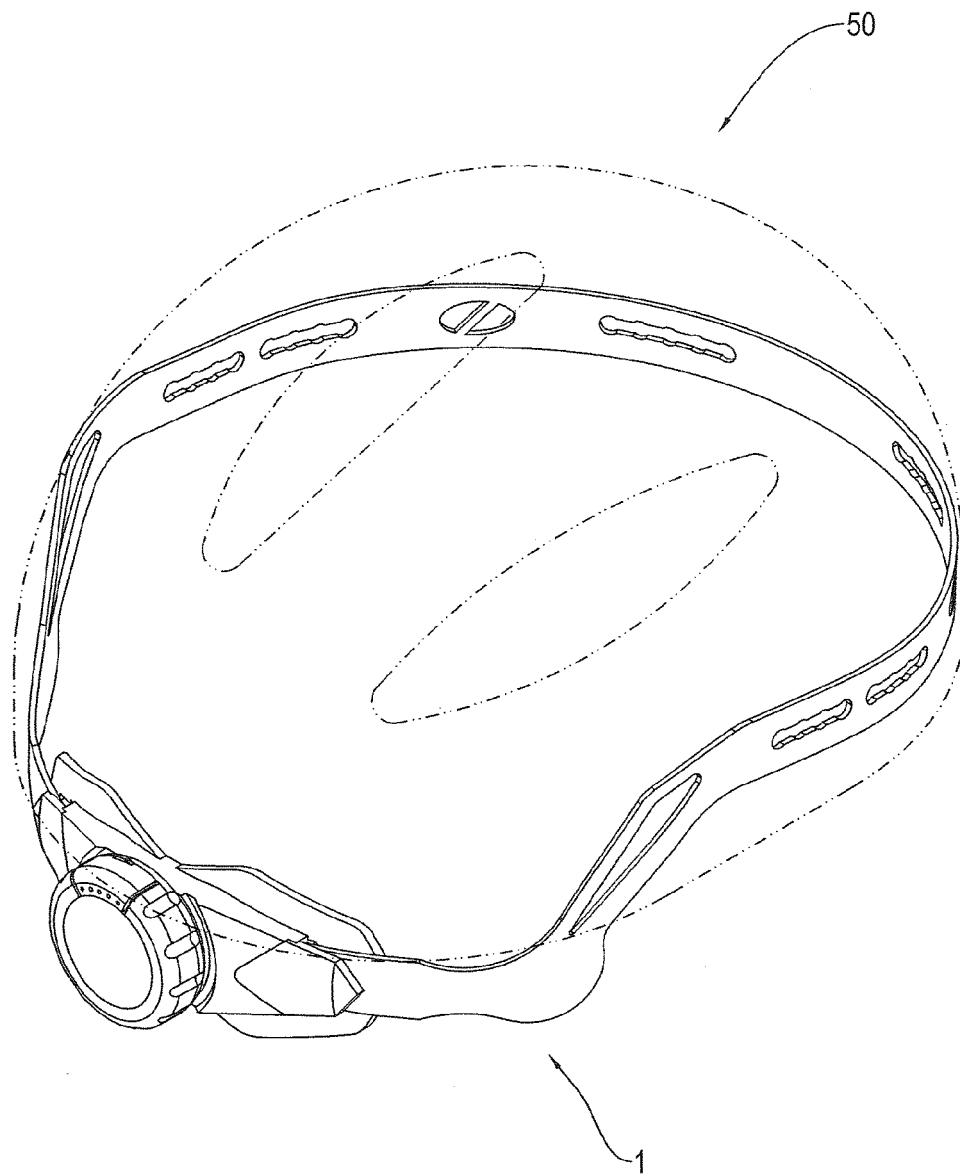


FIG.8



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 0568

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 359 707 A1 (FANG KENNETH [TW]) 24 August 2011 (2011-08-24) * paragraphs [0014] - [0021]; figures 2,3 *	1-12	INV. A42B3/04 A42B3/14
X	DE 201 20 191 U1 (VOSS IRMGARD [DE]) 7 March 2002 (2002-03-07) * page 4 - page 5; figures 1-3 *	1,6-12	
X	EP 1 513 424 A2 (KNAUER HANS-GEORG [DE]) 16 March 2005 (2005-03-16) * page 8, line 26 - page 10, line 26; figures 1-3 *	1,6-12	
A	EP 1 607 012 A1 (KNAUER HANS-GEORG [DE]) 21 December 2005 (2005-12-21) * claim 1; figures 1,4 *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A42B
Place of search The Hague		Date of completion of the search 5 June 2012	Examiner D'Souza, Jennifer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 0568

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-06-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2359707	A1	24-08-2011	NONE
DE 20120191	U1	07-03-2002	NONE
EP 1513424	A2	16-03-2005	AT 324054 T 15-05-2006 DE 10393349 D2 02-06-2005 EP 1513424 A2 16-03-2005 WO 2004000054 A2 31-12-2003
EP 1607012	A1	21-12-2005	DE 202004009362 U1 09-09-2004 EP 1607012 A1 21-12-2005