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The present invention relates to a flashlight with a casing, a light source, and a lamp head having a lens attachment that can be displaced longitudinally axially relative to the light source in order to focus the emitted cone of light and with a clamping device
5 for fixing the lamp head in a selectable longitudinal axial position.

Flashlights of this type are already known from the prior art. A lamp is described, for example, in DE 29 50 850 C2 which emits an essentially parallel light beam when the
10 filament is at the focal point of the paraboloid of the reflector. The beam can be altered by displacing the bulb and the battery casing axially relative to the lamp head and the reflector. Such an axial displacement can be effected by moving the cylinder sleeve axially relative to the battery casing. This axial movement can be effected
15 either by a simple axial sliding movement or by a turning movement, together with a screwthread or with an inclined-slot guide system, wherein an inclined slot is, for example, provided in the lamp head, and a pin that is arranged on the battery casing engages in said slot.

However, it is a disadvantage of such a flashlight that it is intended for the adjustment
20 of the relative position between the lamp head and the light source to be as smooth as possible, but this has the consequence that the relative position between the lamp head or the reflector and the light source can be displaced involuntarily when the flashlight is just shaken slightly, shifting the focusing that has been set. This problem is a commonly observed one in the case of bicycle lamps in particular, which are
25 subject to permanent shaking when in use.

A flashlight which is focusable and whose lamp head is fixable in a selectable axial position by a clamping device is disclosed in US 4,398,238.

30 The object of the present invention is therefore to provide a flashlight that, on the one hand, enables the reflector to be displaced smoothly relative to the light source and, on the other hand, prevents involuntary shifting of the focusing that has been set.

This object is achieved by the flashlight as claimed in claim 1. According to the invention the clamping device has a clamping body, which can turn about the longitudinal axis of the flashlight, with at least one radially oriented and pivotable or
5 expendable clamping element arranged at the end. Advantageously, the possibility is thereby created of combining a smooth and precise adjustable focusing mechanism with the possibility of fixing the lamp head so that the set focus position cannot be shifted.

- 10 Preferred embodiments of the present invention are described below and in the subclaims.

According to a first preferred embodiment, the lamp head is fixed by a frictional or positive connection, wherein the clamping device can preferably be operated via a
15 turning movement of the lamp head relative to the casing. The focus position can thus be set simply and precisely by longitudinally displacing the lamp head axially, it being possible to fix the position via a turning movement of the lamp head, it being possible to fix the position via a turning movement of the lamp head. Both settings can be made using one hand, which further increases the operability of the flashlight.

- 20 As alternatives, constructions are also conceivable in which the longitudinal axial displacement of the reflector relative to the light source is effected by a turning movement and the fixing by a longitudinal axial displacement of the lamp head. The use of an expansion cone is, for example, suitable for this purpose.

- 25 According to a further preferred embodiment of the present invention, the clamping device has a clamping body, which can be turned about the longitudinal axis of the flashlight, having at least one radially oriented and pivotable or expandable clamping element arranged at the end. When the clamping body is turned, the clamping element preferably slides on an upward-sloping surface that is arranged such that the
30 clamping element is pivoted or expanded more and more radially as the clamping body is turned more and more. For this purpose, the upward-sloping surface can, on the one hand, be arranged parallel to the perimeter of the flashlight and the clamping

element can be designed so that it tapers, or the upward-sloping surface is oriented at an angle to the perimeter of the flashlight and the clamping element has a constant thickness. Combinations thereof are of course covered as long as it is ensured that the clamping elements are pivoted or expanded sufficiently radially as the clamping
5 body is turned more and more so that they fulfill their clamping function.

In the assembled state of the flashlight, the lamp head engages around the clamping device so that an annular gap is formed between the clamping device and the lamp head. As long as the clamping element is not pivoted or expanded radially, the lamp
10 head can move longitudinally axially so that the desired focus position can be set. However, the clamping element is preferably pivoted radially via a turning movement of the lamp head in such a way that it presses against the inner shell surface of the lamp head so that the lamp head is fixed with a frictional connection.

15 In order to be able to turn the clamping body and thus the clamping elements, according to a preferred embodiment of the present invention it is provided that the clamping body has a catch that engages in a groove of the lamp head so that the clamping body can be turned by turning the lamp head.

20 So that the clamping device maintains the set position even when the flashlight is shaken strongly, in the clamped state the clamping device can preferably be transferred into a locking position, for which purpose the clamping body, in particular the clamping element, and/or the bearing surface have a groove and/or a corresponding locking catch. In other words, at a certain swept angle of rotation the
25 clamping device engages in a locked position so that the lamp head is not involuntarily turned back into the unfixed position.

The present invention is not restricted to clamping bodies that have a single clamping element and rather clamping bodies are also provided that have multiple, preferably
30 two clamping elements. The clamping bodies and in particular the clamping elements are designed as plastic injection-molded parts.

Other preferred embodiments of the present invention are explained below with reference to the drawings, in which:

Figure 1 shows a schematic view from above of a clamping device,

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Figure 2a shows an exploded view of a flashlight with a lamp head and a clamping device,

Figure 2b shows a flashlight with a clamping device in the assembled state and

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According to a concrete embodiment of the present invention, the clamping device 1 has a clamping body 2 which is mounted so that it can rotate about the longitudinal axis A of the flashlight 3. The clamping body 1 here bears against a base plate 5 at the center of which a light source, preferably an LED 21, is arranged. Moreover, two kidney-shaped elements 6, 6' which fulfill two functions are arranged on the base plate 5. On the one hand, the outer surfaces of the kidney-shaped elements 6, 6' are designed as upward-sloping surfaces 7, 7'. On the other hand, the kidney-shaped elements 6, 6' serve as spacers for a cover plate 8 (see Figure 2) which covers the clamping device 1 from the lens attachment 20.

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The clamping body 2 essentially consists of a web 9 arranged along the diameter of the flashlight 3, a central recess 10 being provided for the passage of the LED 21. Two clamping elements 11, 11' which bear against the upward-sloping surfaces 7, 7' are pivotably arranged radially on the web 9. Furthermore, the clamping body 2 has a radially projecting catch 12 that engages in a groove 13 of the lamp head 14 in the assembled state. In the exemplary embodiment shown, an annular gap 17 is formed between the lamp head 14 and the casing 16 or the base plate 5 so that the lamp head 14 can be displaced longitudinally axially (arrow 4). However, if the lamp head 14 is turned clockwise (arrow 18), the clamping elements 11, 11' are pressed against the cylindrical inner shell surface of the lamp head 14 because the clamping elements 11, 11' have a thickness 15, 15' that gets larger and larger, so that they are pushed outward by the kidney-shaped elements 6, 6' and close the annular gap 17 in

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some areas. The force with which the clamping elements 11, 11' push against the inner shell surface of the lamp head 14 is great enough to fix the latter with frictional contact. To prevent the clamping device 1 from involuntarily falling back into the unfixed position shown in Figure 1, the locking elements 11, 11' have locking lugs 19, 19' which, together with the kidney-shaped elements 6, 6', form an engaged position. The fixed position can thus be quit only by actively turning back the lamp head 14 and therefore the clamping body 2.

Figure 2a shows an exploded view of a flashlight 3 with the casing 16, the lamp head 14, the base plate 5, the clamping body 2 and the cover plate 8. In the assembled state (see Figure 2b), the clamping device 1 and the clamping body 2 are mounted between the base plate 5 and the cover plate 8.

The mode of operation of the present flashlight can be seen with the aid of the cross-sectional view in Figure 3. At its front end, the flashlight casing 16 has a base plate 5 which is connected, spaced apart, to the cover plate 8. The clamping device 1 with the clamping elements 11, 11' is arranged between the cover plate 8 and the base plate 5. The flashlight casing 16, the base plate 5, the clamping device 1, and the cover plate 8 are surrounded by the lamp head 14, at the end of which a lens attachment 20 is arranged. In the unfixed position, the lamp head 14 can be displaced longitudinally axially with respect to the LED 21, as a result of which the desired focus setting can be selected. When the lamp head 14 is turned (in the direction of the arrow 18) about the longitudinal axis A of the flashlight, the clamping elements 11, 11' are pushed against the cylindrical inner shell surface of the lamp head 14 in such a way that longitudinal axial displacement (arrow 17) is effectively prevented. In this state, it is not possible for the set focus position to be adjusted involuntarily.

List of reference symbols

A	Longitudinal axis of the flashlight
1	Clamping device
2	Clamping body
3	Flashlight
4	longitudinal axial direction
5	base plate
6, 6'	kidney-shaped elements
7, 7'	upward-sloping surface
8	cover plate
9	web
10	recess
11, 11'	clamping elements
12	catch
13	groove
14	lamp head
15, 15'	thickness of the clamping elements
16	casing
17	annular gap
18	clockwise direction
19, 19'	locking lug
20	lens attachment
21	LED

Patentkrav

1. Lommelygte med et hus (16), en lyskilde, et lygtehoved (14) med en forsatsoptik (20), der med henblik på fokuseringen af den udstrålede lyskegle er
5 længdeaksialt forskydelig i forhold til lyskilden, og med en klemmeanordning (1) til fiksering af lygtehovedet (14) i en valgbar længdeaksial position, kendetegnet ved, at klemmeanordningen (1) har et omkring lommelygtens (3) længdeakse drejeligt klemmelegeme (2) med i det mindste et på endesiden anbragt klemmeelement (11,
10 11'), der kan svinges eller spredes i radial retning.
2. Lommelygte ifølge krav 1, kendetegnet ved en friktions- eller formbetinget fiksering af lygtehovedet (14), hvor klemmeanordningen (1) fortrinsvis kan betjenes via en drejebevægelse af lygtehovedet (14).
3. Lommelygte ifølge krav 1, kendetegnet ved, at klemmeelementet (11, 11') ved
15 en drejning af klemmelegemet (2) glider på en påløbsflade (7, 7'), der er anbragt sådan, at klemmeelementet (11, 11') ved tiltagende drejning af klemmelegemet (2) i stigende grad svinges eller spredes i radial retning.
4. Lommelygte ifølge krav 3, kendetegnet ved, at
 - a) påløbsfladen (7, 7') er anbragt parallelt med lommelygtens (3) omkredslinje, og
20 klemmeelementet (11, 11') er udformet indsnævrende, eller
 - b) påløbsfladen (7, 7') er orienteret i en vinkel i forhold til lommelygtens (3) omkredslinje, og klemmeelementet (11, 11') har en konstant tykkelse (15).
5. Lommelygte ifølge et af kravene 1 til 4, kendetegnet ved, at klemmeelementet (11, 11') ved sin radiale svingning trykker således på den indvendige kappeflade
25 af lygtehovedet (14), at lygtehovedet (14) er lejret friktionsbetinget.
6. Lommelygte ifølge et af kravene 1 til 5, kendetegnet ved, at klemmelegemet (2) har en medbringer (12), der indgriber i en not (13) i lygtehovedet (14), således at klemmelegemet (2) kan drejes ved en drejning af lygtehovedet (14).
7. Lommelygte ifølge et af kravene 1 til 6, kendetegnet ved, at
30 klemmeanordningen (1) i klemmetilstanden kan overføres til en indgrebsstilling, med henblik hvorpå klemmelegemet (2), især klemmeelementet (11, 11'), og/eller påløbsfladen (7, 7') har en not (13) og/eller et tilsvarende indgrebsfremspring (19, 19').

Fig. 1

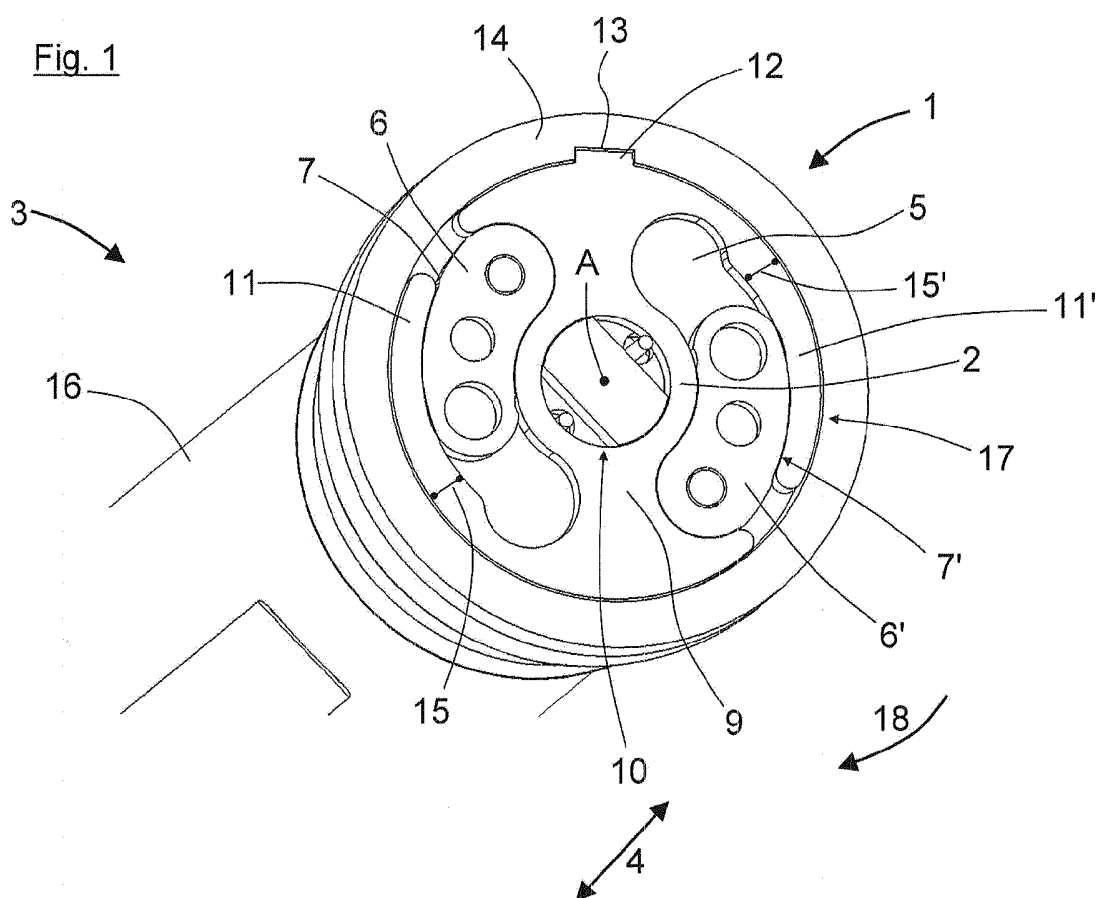


Fig. 2a

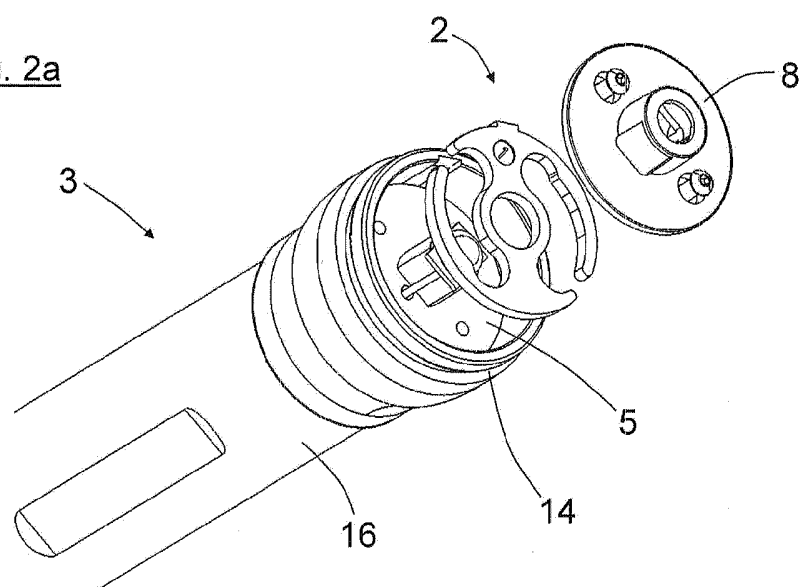


Fig. 2b

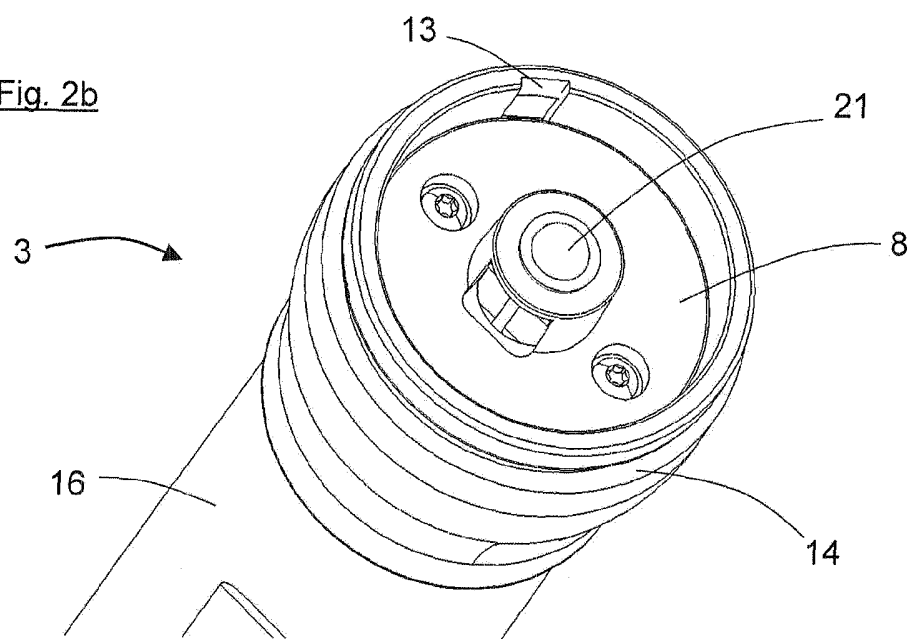


Fig. 3

