

(19) **DANMARK**



Patent- og
Varemærkestyrelsen

(10) **DK/EP 2410232 T3**

(12) Oversættelse af
europæisk patentskrift

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- (51) Int.Cl.: **F 21 L 4/00 (2006.01)** **F 21 V 14/06 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2015-11-23**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2015-09-30**
- (86) Europæisk ansøgning nr.: **10173781.5**
- (86) Europæisk indleveringsdag: **2010-08-24**
- (87) Den europæiske ansøgnings publiceringsdag: **2012-01-25**
- (30) Prioritet: **2010-07-23 CN 201010236838**
- (84) Designerede stater: **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 SE SI SK SM TR**
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- (54) Benævnelse: **Fokuserbar lommelygte**
- (56) Fremdragne publikationer:
DE-U1- 20 308 739
US-A- 5 349 506
US-A- 5 440 462
US-A- 5 595 435
US-A- 5 735 594
US-A1- 2008 068 833
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The present invention relates to a flashlight with a casing, a light source, a lens assembly mounted at a head- end whereby the head-end can be shifted

5 longitudinally relative to the light source and a two-part connecting element arranged between the lamp head and the housing, whose parts are axially moveable relative to each other and are securely held, whereby one part of the connecting element is connected with the lamp head and the other part is connected with the housing, the parts are cylindrical and have each a threaded portion and the lamp head and the
10 housing have corresponding threaded portions.

Focusable flashlights according the above mentioned kind are in principle known from the state of the art whereby in particular in US 5,595,435 a focusable flashlight is disclosed with a correspondent embodiment.

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Furthermore a flashlight with a converging lens mounted at the front end, a light source and a partly light transparent image carrier arranged between the converging lens and the light source are described in DE 203 08 739 U1. The image carrier is fixed in a longitudinal shiftable sleeve. With its longitudinal displacement the distance
20 of the light source to the converging lens as well as the distance of the image carrier to the converging lens is changeable to allow projection of the image. For the displaceable support of the image carrier, in addition to the lamp head and the casing, at least three further connecting sleeves are provided, namely an adapter, a guide sleeve and a sliding sleeve, so that an assembling of the flashlight is relatively
25 complex.

In addition, flashlights are known in which the lamp head focuses the emitted light with a reflector it carries and the casing with the light source are connected to one another via a threaded connection such that the reflector and the light source can be
30 displaced relative to one another by a rotary motion. However, this embodiment has the disadvantage that two hands are always required for focusing, the casing being held with one hand and the lamp head being rotated with the other hand.

Finally a lamp with a shiftable lens holder is described in US 5,440,462 that is connected with the housing by a screw thread and is able to be displaced by that.

- 5 It is therefore the object of the present invention to provide a focusable flashlight, that can be focussed with one hand and for whose assembly only a small number of connecting sleeves is required.

This object is achieved by the flashlight according to claim 1. According to the
10 invention the part has axially extending guide arms, that are in contact with guide grooves on the other part, that interrupt at least partly the threaded portion on part, whereby the guide grooves have a stop and the guide arms have a widened head for the secure connection. The result is a particularly compact focusable flashlight that is easy to manufacture and easy to operate. Due to the low number of components
15 used, assembly costs are also reduced. Furthermore the lamp head is not accidentally detached from the casing during focusing by the captive connection of the parts and the relative movement of the parts with respect to one another is limited on the one hand by the end faces themselves and on the other hand by the stop and the enlarged head part.

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Further preferred embodiments of the present invention are described below as well as in the subordinate claims.

According to a first embodiment, the parts are cylindrically tubular and each have
25 respective screwthreads that join them to complementary screwthreads on the lamp head and casing. Alternatively, the parts can also be connected via a bayonet of another detachable connection, such as, for example, a locking connection, to the casing or to the lamp head. However, a threaded connection is preferred due to the ease of production and assembly.

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Preferably the slide arms are of cylindrical or partly cylindrical shape. In an embodiment with a plurality of partially cylindrical slide arms, they are preferably spaced equiangularly. The number of slide arms can vary depending on the size of the flashlight, at least three slide arms and three guides are preferred.

In an embodiment with several slide arms, the expansions can be tangential.

It is preferably provided that the guides are on the outside of the part and the thread is interrupted by the guides at least in some regions.

In order to prevent the lamp head from being accidentally displaced with respect to the casing and thus to the light source, one guide element is preferably arranged so that relative movement of the parts can be performed only against a force. In the simplest case the guide element is an O-ring of rubber or another elastic material, which on the one hand surrounds the casing and on the other hand is sized such great so that a friction is produced between the lamp head and the O-ring that the lamp head can be displaced only deliberately. A guide element of this type can be produced economically and is easily replaced in the case of wear. In addition, the guide element serves as a seal so that no dirt in the form of dust can intrude into the lamp head.

The connecting sleeve is preferably made by injection molding of plastic or is produced from metal, in particular aluminium.

According to a further embodiment of the present invention the light source is an LED carried on a holder plate. This holder preferably has electric contacts concentrically in a circular or annular layout on its rear face, that are connected to corresponding electrical contacts of the batteries. Furthermore, the holder has on the rear side an annular mating surface formed of a heat-conducting material and is in abutment with the casing. The heat produced in the light source is hereby dissipated to the casing,

which in particular increases the service life of the light source. Aluminium, brass or copper are in particular suitable as materials.

Concrete and further preferable embodiments of the present invention are described
5 with reference to the following figures. It shows

Fig. 1: a flashlight with a casing and a lamp head in disassembled condition,

Fig. 2: a flashlight in assembled condition,

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Fig. 3: a casing with a connecting element and

Fig. 4: is a perspective view of the connecting sleeve.

15 The flashlight 1 has particularly a casing 2, a light source 3, a lens assembly 4, a lamp head 5 and a connecting element 6, that is on one hand connected with the casing 2 and on the other hand with the lamp head 5 (Fig. 2). Therefore screwthreads 7, 7', 7'' are provided in the shown case.

20 According to a concrete embodiment the light source 3 is carried on a disk shaped holder 8, that is seated on a socked shaped stop inside the casing 2. When assembled the holder 8 is pressed by the connecting sleeve 6 onto the socked shaped stop and thus positively fixed. Electrical contacts as well as heat-conducting surfaces (not shown) are provided on the back face of the holder 8. The lens
25 assembly 4 is longitudinally displaceable arranged on the other side of the holder 8 whereby the distance between the examples shown in Fig. 1 and Fig. 2 is steplessly adjustable. In Fig. 1 the lens assembly 4 bears against the disk shaped holder 8 whereas in Fig. 2 the holder 8 and the lens assembly 4 are at a spacing A to each other. In order to prevent accidental shifting of the lamp head 5 and therewith of the
30 lens assembly 4, an O-ring 9 is provided as guidance, that is in contact with the casing 2 and the lamp head 5 in the assembled state.

In Fig. 4 a connecting sleeve 6 is shown in detail, whereby this one has two parts 41, 42, that can move longitudinally in the direction of arrow 47 and that are captively fixed. To this end the part 41 has three guide arms 43, 43', 43'' with a wide head region 44. The other part 42 has corresponding guide grooves 45, 45', 45'', that have
5 a stop 46. The guide arms 43, 43', 43'' and the guide grooves 45, 45', 45'' are dimensioned in such a manner that the wide head region 44 and the stop 46 bears against each other if the parts 41, 42 are displaced from each other.

Patentkrav

- 5 1. Lommelygte med et hus (2), en lyskilde (3), en forsatsoptik (4), der er anbragt i et lampehoved (5), hvor lampehovedet er længdeaksialt forskydeligt i forhold til lyskilden (3), og med et mellem lampehovedet (5) og huset (2) anbragt todelt forbindelseselement (6), hvis dele (41, 42) er fastgjort længdeaksialt forskydeligt i forhold til hinanden og tabssikkert, hvor en del (42) af forbindelseselementet (6) er
- 10 forbundet med lampehovedet (5), og den anden del (41) med huset (2), delene (41, 42) er udformet cylinderformet og hver gang har et gevindafsnit (7', 7''), og lampehovedet og huset har modsvarende gevindafsnit (7),
- kendetegnet ved, at delen (41) har længdeaksialt udstående glideskinner (43), som er i anlæg med glideflader (45), der er udformet på den anden del (42), og som
- 15 afbryder delens (42) gevind i det mindste område vist, hvor glidefladerne (45) med henblik på den tabssikre forbindelse har et anslag (46), og glideskinnerne (43) har en hoveddel (44), der er gjort bredere.
2. Lommelygte ifølge krav 1, kendetegnet ved, at glideskinnerne (43) er udformet delcylinderformet.
- 20 3. Lommelygte ifølge et af kravene 1 eller 2, kendetegnet ved, at glidefladerne (45) er anbragt på delens (42) yderside.
4. Lommelygte ifølge et af kravene 1 til 3, kendetegnet ved, at forbindelseselementet (6) er en sprøjtestøbt kunststofdel eller er fremstillet af metal, fortrinsvis af aluminium.
- 25 5. Lommelygte ifølge et af kravene 1 til 4, kendetegnet ved, at lyskilden (3) er en LED, der er anbragt på en pladeformet holder (8).
6. Lommelygte ifølge et af kravene 1 til 5, kendetegnet ved, at holderen (8) på bagsiden har cirkel- og ringformede, koncentrisk anbragte elektriske kontaktflader.
7. Lommelygte ifølge et af kravene 1 til 6, kendetegnet ved, at holderen (8) på
- 30 bagsiden har en ringformet anlægsflade, der består af et varmeledende materiale og er i anlæg med huset (2).

Fig. 1

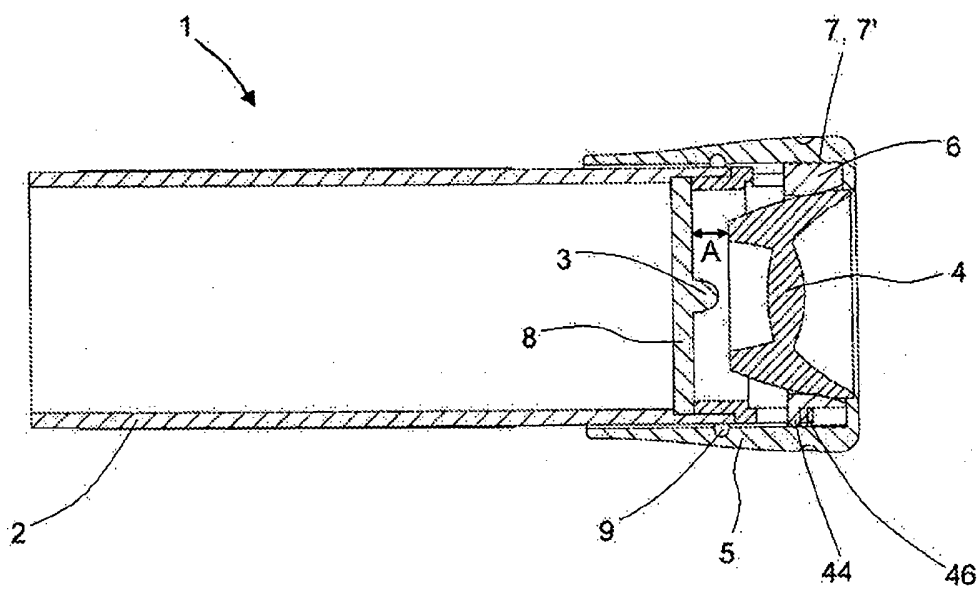
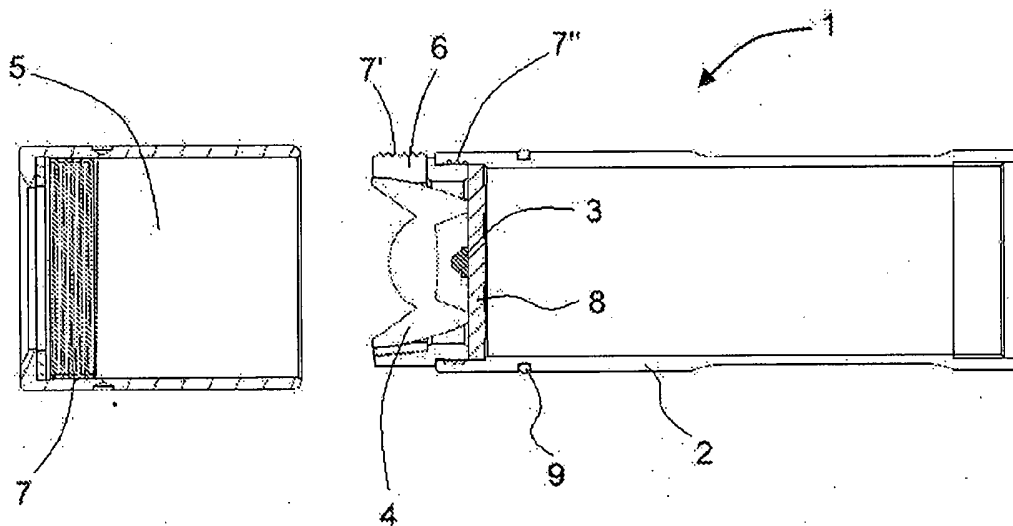


Fig. 2

Fig. 3

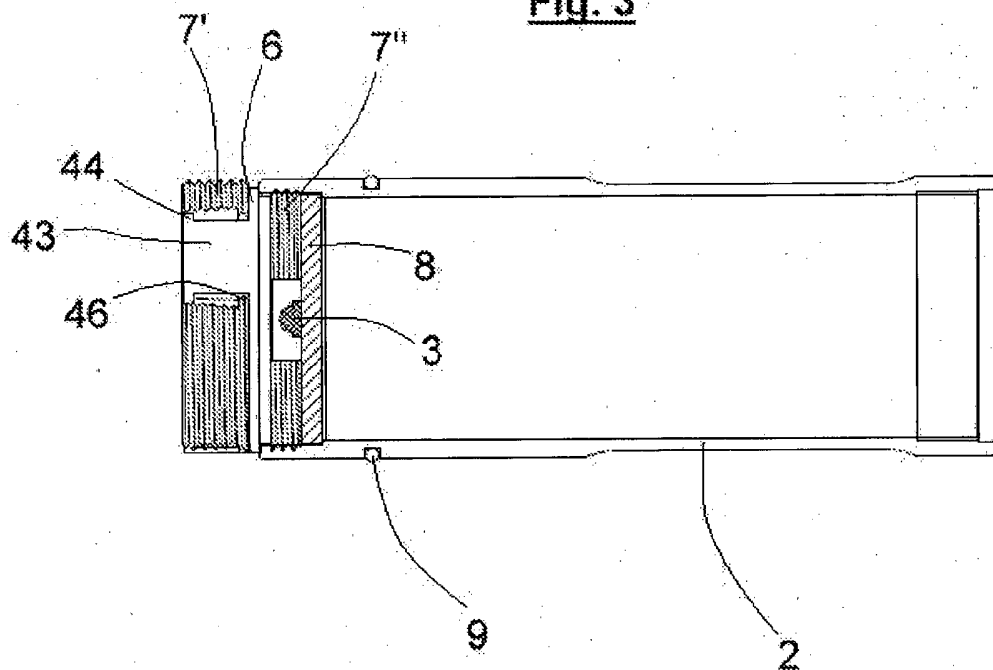


Fig. 4

