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(54) **Multipurpose tool of particular use for underwater activities**

(57) The invention relates to a knife whose hollow handle (1) features a support (2) at the front integral with the blade (3); on the front end of the handle (1) at the end of the blade (3) are fitted several high-intensity micro-lamps (4), inside special housings, powered by one or more batteries housed inside the handle (1); the support (2) has holes corresponding to the positions of the micro-lamps (4).

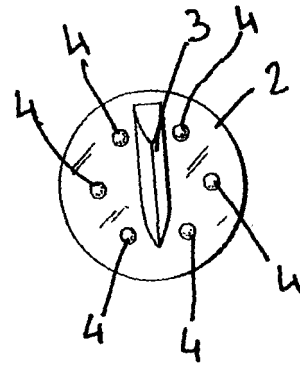


FIG 2

EP 1 995 170 A1

DescriptionField of the invention

[0001] The invention relates to a multipurpose tool the handle of which is fitted with lamps for lighting up the tool's field of action and which has been designed to allow the easy attachment and removal of the tool accessories, for replacement purposes.

Background of the invention

[0002] There are many jobs and activities, such as sports and leisure activities and those carried out by underwater divers, speleologists, alpinists, members of emergency and rescue services, like firemen, for example, and others besides, that entail a certain amount of risk, for which reason it is important and, indeed, vital at times, to have at one's disposal the tools and equipment most suited to perform one's job and assist one in getting out of dangerous situations, fastly and safely.

[0003] Underwater divers, for example, carry a knife and a lamp with them to tackle dangerous situations.

[0004] The knife can come in useful, for example, to free, oneself quickly from a tangled rope obstructing movement, or to cut through an entangled net, or to defend oneself, in certain extreme cases, from attack by sea animals, while the lamp can be of use not only in all the above mentioned situations, but also to explore caves and light up the water, especially where the sea is very deep.

[0005] It is obvious, even to non experts of underwater diving, that having to handle a knife with only one hand, because one is holding a lamp in the other to assist in whatever operation is being performed, can be rather awkward and inconvenient and may jeopardize the speed and success of the operation, because a diver, for example, would have to rely only on the movement of his flippers for stability, without being able to use his other hand.

[0006] This has long been a strongly felt problem an attempt at solving which, a while back, led to the invention of lamps that can be fastened to the head in order to leave the hands free.

[0007] Unfortunately, this is not always the ideal solution, because the success of an operation can depend on the possibility to accurately direct the beam of the lamp with the head onto a certain point of interest, and this is not always easy or possible to do.

Description of the invention

[0008] The invention relates to a tool, for example a knife, featuring a watertight handle that is fitted with lamps for lighting up the field of action; the handle and/or the tool has been designed to allow the easy attachment and removal of a range of accessories, for different purposes, using the same handle.

Description of the drawings

[0009] The present invention will now be described with reference to the attached drawings:

Figure 1 shows a partially cross-sectioned side view of a knife fitted with lamps according to the present invention.

Figure 2 shows a front view of the knife shown in figure 1.

Figure 3 shows a partially cross-sectioned side view of a screwdriver fitted with lamps according to the present invention.

Figure 4 shows a front view of the screwdriver shown in figure 3.

Description of the preferred embodiment

[0010] Referring to figures 1 and 2 the tool according to a preferred embodiment of this invention comprises a knife-blade attached to a hollow handle (1), at the front of which handle there is a support (2) holding the blade (3); on the front of the handle (1), at the base of the blade (3), several high-intensity micro-lamps (4) are fitted inside special housings, powered by one or more batteries housed inside the handle (1). The support (2) has holes corresponding to the positions of the micro-lamps (4).

[0011] The rear end of the handle (1) has a screw-thread (5).

[0012] The cap (7) applied to the back of the handle (1) also houses the switch (8) for switching the lights on and off; the front part of the cap also has a screw-thread (9).

[0013] A coupling ring (6), threaded at both ends (10 and 11), in opposite directions, allows the cap (7) to be fitted and tightened onto the handle (1), without having to rotate the cap (7) when opening and closing the battery housing, thus preventing the cables connecting the light switch and the batteries from getting tangled and damaged.

[0014] The beam of light projected by the lamps (4) is very intense and can be accurately and uniformly directed towards the field of action, without creating shadow zones, such as inevitably occurs when a beam is directed at an angle, which is generally the case when the lamp is held with the other hand or fastened to the head.

[0015] The greatest advantage, however, is obviously that of freeing the other hand for better manipulation, for helping maintain stability in water, or for using another tool, without having to give up on the lighting.

[0016] As mentioned above, any accessory (12) can be attached to the handle of the tool referred to in this invention, such as, for example, a spanner, screwdriver, etc., so that it can be used for a broad range of maintenance jobs conducted on items of equipment, boats, etc: located underwater or inside a cave.

[0017] In another embodiment of this invention, each accessory - blade, screwdriver, spanner, etc. - may be

fitted to a ring, also featuring holes for lamps, engaging the ring (2), and which may be easily and securely screwed onto the ring (2), or other support integral with the handle (1). This embodiment allows a single handle to serve as support and lamp for a wide range of tool accessories or, on itself, simply as a lamp.

[0018] Obviously, the screw-thread coupling of the tool accessory and handle can be replaced by other types of coupling, such as a bayonet joint, for example, or other known and commonly used systems.

[0019] The batteries powering the lamps may be rechargeable, in which case suitable contacts will be provided, or the space for an induction charger, inside the handle or elsewhere.

Claims

1. A multipurpose tool of particular use for underwater activities, which comprises:
 - a hollow watertight compartment shaped like a handle (1);
 - high-intensity micro-lamps (4) fitted at one end of the above mentioned hollow watertight compartment shaped like a handle (1);
 - a tool accessory (3) integral with the handle (1) and attached at the same end that is fitted with the micro-lamps (4);
 - means designed to firmly fasten the tool accessory (3) to the handle (1);
 - a removable cap (7) for closing the hollow watertight compartment (1) shaped like a handle;
 - batteries powering the above mentioned micro-lamps (4);
 - a switch (8) for switching the micro-lamps (4) on and off.
2. A multipurpose tool of particular use for underwater activities according to claim 1 **characterized in that** the tool is a knife (3).
3. A multipurpose tool of particular use for underwater activities according to claim 1 **characterized in that** the tool is a screwdriver.
4. A multipurpose tool of particular use for underwater activities according to claim 1 **characterized in that** the tool is a spanner.
5. A multipurpose tool of particular use for underwater activities according to claim 1 whereby the end of the hollow compartment (1) has a screw-thread (7) and the end of the cap (7) also has a screw-thread (9), in the opposite direction compared to the screw-thread (5), and a coupling ring (6) is used to screw the cap (7) to the compartment (1) in an airtight manner.
6. A multipurpose tool of particular use for underwater activities according to claim 1 whereby the hollow compartment (1) features contacts for recharging the batteries.
7. A multipurpose tool of particular use for underwater activities according to claim 1 whereby the cap (7) features contacts for recharging the batteries.
8. A multipurpose tool of particular use for underwater activities according to claim 1 whereby the system for ensuring that the tool accessory (3) is fastened firmly to the handle (1) consists of a bayonet coupling fitted with a safety lock.
9. A multipurpose tool of particular use for underwater activities according to claim 1 whereby the system for ensuring that the tool accessory (3) is fastened firmly to the handle (1) consists of a screw coupling fitted with a safety lock.

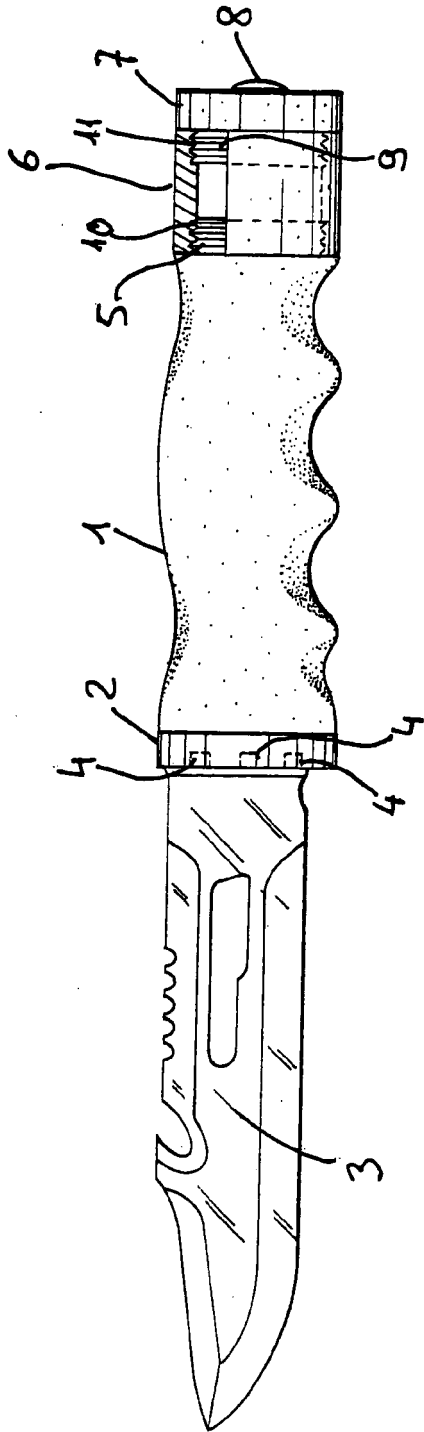


FIG 1

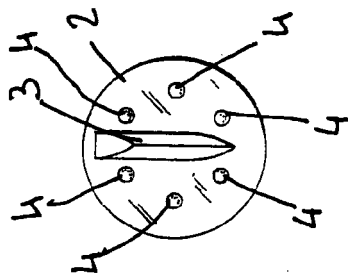


FIG 2

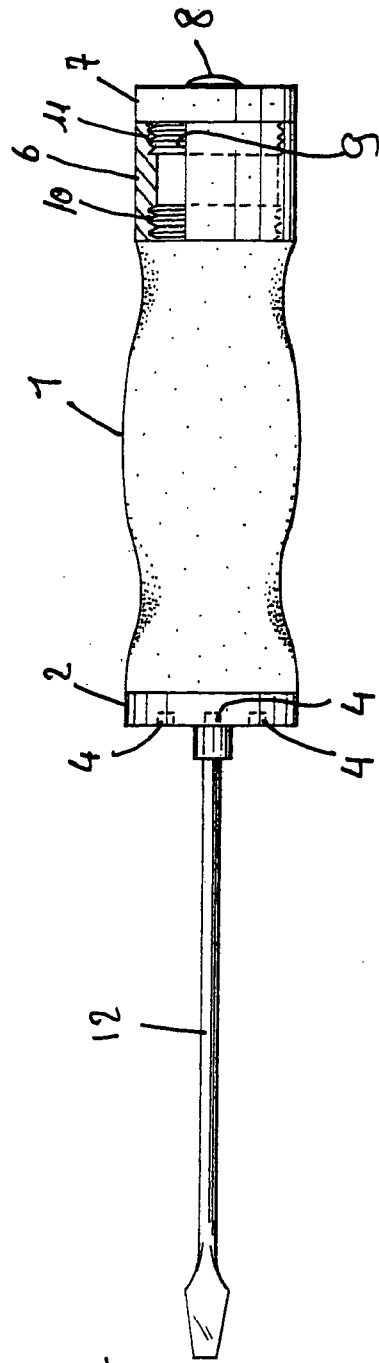


FIG 3

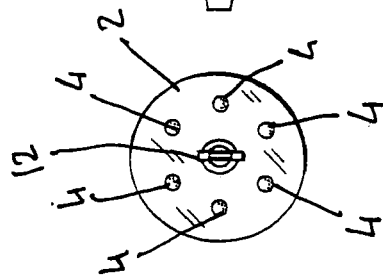


FIG 4



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3 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 August 2008	Examiner De Sena Hernandorena
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	



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 August 2008	Examiner De Sena Hernandorena
<p>3</p> <p>EPO FORM 1503 (03.82) (F04/C01)</p> <p> 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 </p>			

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

EP 07 42 5702

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
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