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(54) Lighting means

(57) A light apparatus is provided. The apparatus includes a housing; at least one light source; and motion sensing means. The at least one light source is illuminated upon detection by the motion sensing means of movement and the at least one light source subsequently ceases to illuminate after a predetermined period of non-movement.

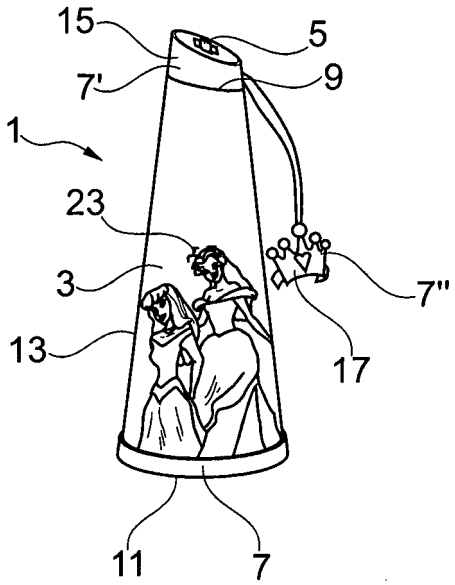

Fig. 1

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Description

[0001] The invention to which this application relates is a lighting means which can act as any, or any combination of, a torch, nightlight and/or provide an extended glow combination, and a method of use thereof.

[0002] Although the following description refers to the use of children's nightlights and torches, the person skilled in the art will appreciate that the present invention could also be used for adults in need of torches/standing lights and/or the like.

[0003] Combination flashlights and nightlights are known in the art, some of which use multiple light sources, e.g., a separate light source for the flashlight element and a light source for the nightlight element, and some that use only a single light source for both the flashlight and the nightlight. These are provided such that, for example, a child user can use this type of device while awake, as a torch, and also while falling asleep at night, as a nightlight. Certain nightlight designs may also be provided to display characters, shapes and/or patterns for decorative/ornamental purposes.

[0004] US 6,280,051 B1 (Wallach) discloses a novelty flashlight with a transparent body, split into two halves. The front half is conically-shaped and houses a light bulb, batteries and a switch. This end acts as a flashlight when in use. The rear half houses a liquid, such as water, and ornamental elements. The front end of the flashlight can be covered with an opaque cap, which prevents light from being emitted therefrom. Instead, the light is emitting towards the rear of the device, illuminating the liquid and elements contained therein, acting as a child's night light. US 6,280,051 B1 therefore provides a combination flashlight and nightlight utilizing only a single light source. However, US 6,280,051 B1 requires that the combination flashlight and nightlight be activated by the on/off switch provided on the front half of the device, and has no "auto-on" or "auto-off" functionality. This can be troublesome when acting as a nightlight because after the child using the device has fallen asleep, the nightlight will remain illuminated throughout the night until it is switched off by a parent/guardian or by the child in the following morning. Furthermore, once the nightlight is eventually switched off, light will cease to be emitted from the device immediately and the child may be left to fall asleep in the dark, or the nightlight will have remained on constantly throughout the night. Both circumstances present a problem to the user, in that if the child wakes up in the dark and requires the nightlight to be activated, they will have to struggle to find the on/off switch in order to activate the nightlight. Alternatively, if the nightlight is left on throughout the night, the light can disturb the child once they have settled and are asleep/about to fall asleep. These scenarios are therefore not desirable.

[0005] It is therefore an aim of the present invention to provide an apparatus for use as a combination flashlight and nightlight that overcomes the aforementioned problems.

[0006] It is a further aim of the present invention to provide a method of using such an apparatus.

[0007] According to a first aspect of the invention there is provided a light apparatus, said apparatus including a housing; at least one light source located therein and wherein said apparatus further includes motion sensing means, said at least one light source illuminated upon detection by said motion sensing means of movement of the apparatus.

[0008] In one embodiment the said at least one light source ceases to illuminate after a predetermined period of non-movement of the apparatus.

[0009] Typically the said at least one light source ceases to illuminate after a predetermined period of non-movement. Most typically the detection by the motion sensing means is detection of the movement of said housing in at least one direction but in addition to, or instead of, this detection, the, or additional, sensing means can be provided in order to detect movement of persons in the vicinity of the apparatus and, in turn, cause illumination of the light source.

[0010] In one embodiment the apparatus is provided to act as a night light and/or torchlight.

[0011] In one embodiment the apparatus includes a plurality of light sources which can be operated together to cause illumination or may be selectively operated in dependence upon the particular operating function of the apparatus at that time. For example, one or more of the light sources may operate to generate light towards an end of the apparatus housing when the torchlight function is selected and the same or another one or more light sources are operated to illuminate and direct light towards the walls of the housing of the apparatus when the apparatus is selected to operate as a nightlight. In one embodiment the detection of movement of the apparatus causes the selection of operation of the apparatus as a nightlight and separate switch allows the selection of operation of the apparatus as a torchlight.

[0012] In one embodiment when the light source ceases to illuminate one or more portions of the apparatus are provided to emit light for a further predetermined period of time. In one embodiment said one or more portions are formed of photoluminescent material.

[0013] Thus, the present invention provides a novel apparatus with at least one light source that can be illuminated to emit light upon detection of movement of the apparatus by motion sensing means. This, therefore, overcomes the problem associated with searching for an on/off switch for the apparatus in the dark; simple movement of the apparatus will illuminate the light source, and subsequent non-movement will result in the light source ceasing to illuminate. Furthermore, once the light source ceases to illuminate after the period of non-movement, there is a residual "afterglow" or "glow-in-the-dark" effect provided by the one or more photoluminescent portions associated with the apparatus. These portions help to bridge the gap between full illumination of the at least one light source and complete darkness once the light

sources ceases to illuminate; a feature not present in the prior art.

[0014] In one embodiment, the one or more photoluminescent portions are located on the housing and/or are provided on one or more items associated with the housing. In one embodiment said one or more photoluminescent portions are located on walls of the housing. Further typically, two or more photoluminescent portions are provided on the walls of the housing. In addition or alternatively one or more items, such as charms may be provided in association with, and typically connected to, the housing and it is these items which are provided with the one or more photoluminescent portions.

[0015] In one embodiment, one or more photoluminescent portions are located at an end of the apparatus. Typically, one or more photoluminescent portions are located at an end of the housing.

[0016] In one embodiment, one or more photoluminescent portions are provided as an attachment to the apparatus.

[0017] In one embodiment, said one or more photoluminescent portions are provided as part of the housing. Typically, said one or more photoluminescent portions are located as part of walls of the housing.

[0018] Thus, the one or more photoluminescent portions may be provided as various parts of the apparatus; they may be formed integrally with the housing and/or the housing walls, formed as portions located on and/or over the housing, and may also be provided as separate attachments, or a combination of any of the above.

[0019] In one embodiment, said one or more photoluminescent portions are provided as one or more phosphorescent portions.

[0020] In one embodiment, said one or more photoluminescent portions continue to emit light for a predetermined period of time, such as in the range of 10-30 minutes, following cessation of illumination of said at least one light source. Preferably, said one or more photoluminescent portions continue to emit light for a predetermined time following cessation of illumination of said at least one light source.

[0021] In one embodiment the photoluminescent portion or portions are located such that if external light sources are present and illuminated while the at least one light source of the apparatus is not, the one or more photoluminescent portions may emit light for the predetermined period of time following cessation of illumination of the external light sources.

[0022] In one embodiment, the at least one light source is directed towards a first end of the apparatus. Typically, said first end comprises a transparent portion, such that light illuminated from said at least one light source is emitted from the apparatus. Further typically, said light emission is in the form of a flashlight.

[0023] In one embodiment, said housing comprises, at least in part, partially transparent walls. Typically, said partially transparent walls enable light to be illuminated through said walls.

[0024] In one embodiment, light is further illuminated through said housing when blocking means are provided to substantially prevent light emission through the first end of the apparatus. Typically, said blocking means may be provided in the form of a surface, wall, desktop and/or the like.

[0025] Thus, if the apparatus is placed by a user, on a surface such as a table, desktop, floor and/or the like, emission of light from the at least one light source through the first end of the apparatus, i.e., the flashlight, is substantially blocked, causing the light emitted through the at least partially transparent walls of the housing, to be greater in intensity and therefore provide a glow lighting effect such as to act as a night-light.

[0026] In one embodiment, the predetermined period of non-movement of said housing prior to cessation of illumination of said at least one light source is between 10 seconds and 30 minutes. Preferably, the predetermined period of non-movement is between 30 seconds and 15 minutes. Further preferably, the predetermined period of non-movement is between 1 minute and 10 minutes. Most preferably, the predetermined period of non-movement is 2 minutes.

[0027] In one embodiment, after the expiry of the predetermined period of non-movement, said at least one light source fades gradually from full illumination (on) to no illumination (off) in a predetermined period of time.

[0028] In one embodiment, said period of time is between 2 seconds and 1 minute. Preferably, said period of time is between 5 seconds and 30 seconds. Most preferably, said period of time is 10 seconds.

[0029] In one embodiment, the motion sensing means detect movement of the apparatus and/or housing in at least one axis of movement. More typically, the motion sensing means detect movement of the apparatus and/or housing in at least two axes of movement.

[0030] In one embodiment, upon detection of movement by the motion sensing means, the at least one light source is illuminated. Thus, it is movement of the apparatus such as the housing, that is detected by the motion sensing means, which acts as a trigger to illuminate the at least one light source, as opposed to alternative light sources known in the art, whereby movement near the device is sufficient to trigger illumination.

[0031] In one embodiment the apparatus includes a switch which can be operated to perform an on and off function on the light source, independently of the sensing means.

[0032] In an alternative embodiment the said at least one light source is caused to stop illuminating by a further detected movement of the apparatus which may be the same movement or type of movement which is detected to initially cause the light source to be illuminated or alternatively may be a different form of movement. In this case the same or a further motion sensor means may be provided and, if two sensors are provided one acts as a means for switching the light source on and the other acts as a means for switching the light source off when

movement is detected.

[0033] Thus, the present invention therefore has the advantage that the apparatus is provided with at least one light source that can be illuminated to emit light in a particular direction, i.e., akin to a flashlight, and also be illuminated within the housing of the apparatus to provide a nightlight for a user. The apparatus of the present invention has no requirement for a specific on/off switch to be provided on the external face of the housing for user actuation because illumination of the at least one light source is activated when the motion sensing means detects movement of the device, and then ceases to illuminate after a predetermined period of non-movement of the apparatus and/or housing. Subsequent to the light source ceasing to illuminate, the one or more photoluminescent portions provide a residual light source or "afterglow" / "glow-in-the-dark" effect, for a further predetermined period of time.

[0034] Embodiments of the present invention will now be described with reference to the accompanying figures, wherein:

Figure 1 illustrates a perspective view of an apparatus in accordance with an embodiment of the present invention.

Figures 2a - c illustrate various illuminating aspects of an apparatus in accordance with an embodiment of the present invention; and

Figures 3a - f illustrate the functionality of motion sensing of an apparatus in accordance with an embodiment of the present invention.

[0035] Referring firstly to Figure 1 there is provided an apparatus in the form of a combination flashlight and nightlight (1), which includes a body housing (3) with a top end 9, at least one light source (23)located within the housing (3), and a motion sensor (5) located within the housing. In accordance with the invention, when the light source is activated such that light is emitted from the light source, such as an LED, a night light flow effect can be created. The light source (23) is moved to an illuminated condition when the motion sensor detects movement of the apparatus (1) in at least one direction. Once the light source is moved to the illuminated condition, then, in one embodiment, once a predetermined period of non-movement of the apparatus (1) has occurred, i.e. a predetermined period of time passes whereby the motion sensor (5) fails to detect any movement of the apparatus (1), the light source is deactivated and the same is no longer illuminated.

[0036] However in accordance with one aspect of the invention, a plurality of photoluminescent portions (7, 7', 7") are provided in association with the flashlight (1). In this particular embodiment, three photoluminescent portions are provided on the housing, although it will be appreciated that this number may be varied to suit particular design requirements. The photoluminescent portions (7, 7', 7") act in such a way that, upon cessation of illumination of the light source (23), they continue to emit light and "glow" for a further predetermined period of time following the switching off of the light source.

[0037] Thus, the apparatus (1) provided in the present patent application has the advantage that the light source is illuminated to emit light upon detection of movement of the apparatus (1) by motion sensor (5). This, therefore, overcomes the problem with conventional combination flashlights and nightlights associated with searching for an on/off switch in the dark; as simple movement of the apparatus will illuminate the light source, and subsequent non-movement of the apparatus for a predetermined period of time will result in the light source ceasing to emit light. Furthermore, once the light source (23) deactivates after the period of non-movement, there is a residual "afterglow" or "glow-in-the-dark" effect provided by the plurality of photoluminescent portions (7, 7', 7") associated with the flashlight (1). These portions help to bridge the gap between full illumination of the light source and complete darkness once the light sources ceases to illuminate; a feature which is not present or suggested in the prior art.

[0038] In one embodiment the light source 23 when illuminated allows light to pass towards the bottom end (11) of the flashlight (1). The bottom end (11) has a transparent cover such that light may be emitted therethrough, thus providing a flashlight functionality of the apparatus (1). The walls (13) of the housing (3) are provided, at least in certain parts, as at least partially transparent. The partial transparency enables light emitted from the light source 23 to pass through the walls (13) of the housing (3). This effect can be made more prominent when the apparatus (1) is placed on a flat surface (23) such as a wall, table, desktop and/or the like, and is exemplified in Figure 2b. Thus, if a user places the apparatus (1) on such a surface, emission of light from the light source through the bottom end (11) of the flashlight (1) will be blocked, allowing the light to be emitted through the at least partially transparent portions of the walls (13) of the housing (3), thereby allowing the apparatus to operate in the form of a night-light. The functionality of the apparatus (1) is therefore easily adaptable from that of a flashlight to a night-light.

[0039] The duration of time of non-movement of the apparatus (1) that can pass from its last movement until the light source deactivates / switches-off / ceases to illuminate can be predetermined. Such a period can be set at any length, although usually between 10 seconds and 30 minutes. More preferably, predetermined periods of non-movement are between 30 seconds and 15 minutes, and between 1 minute and 10 minutes. In this particular example, the predetermined period of non-movement prior to cessation of illumination of the light source is 2 minutes. Upon expiry of the predetermined period of non-movement of the apparatus (1), the light source 23 is controlled such that the light emitted therefrom fades

out gradually from full illumination (on) to no illumination (off). This fade-out is also designed to occur over a predetermined period of time. Usually, this period of time will be between 2 seconds and 1 minute, although it will be appreciated that any period of time can be set. More preferable predetermined periods of time are between 2 seconds and 1 minute, and between 5 seconds and 30 seconds. In this particular example, the period of time is 10 seconds. These predetermined periods of time, both for the period of non-movement of the apparatus (1) and for the fade-out of the light source, can be set by the manufacturer as default times. The apparatus (1) may also be provided with an option for the user to adjust and/or set their own predetermined periods of time, suitable to their own needs.

[0040] The photoluminescent portion or portions (7, 7', 7") can be located on the housing (3) of the apparatus (1) and/or on an item associated with the housing. Indeed in one embodiment only one photoluminescent portion is provided and that is provided on the item 17 so that none are provided on the housing.

[0041] With reference to the embodiment shown in the Figures, of the three portions indicated in Figures 1 - 2c, one portion (7) is located on and around the walls (13) of the housing (3), one portion (7') is located on or as part of an end cap (15) at the top end (9) of the apparatus (1), and one portion (7") is located as an item (17) such as a charm, associated with the apparatus (1). It will be appreciated by the skilled person that additional photoluminescent portions may be included, for example, additional portions (7) may be located at various points on the walls (13) of the housing (3). Furthermore, the photoluminescent portions may also be formed as part of the walls (13) of the housing (3), although such an example is not shown in the Figures in this instance.

[0042] Thus, the photoluminescent portions (7, 7', 7") are provided on various parts of the apparatus (1); they may be formed integrally with the housing (3) and/or the housing walls (13), formed as portions (7) located on and/or over the housing (3), formed as or located on an end cap (7', 15) and also be provided as separate attachments (7", 17). The particular embodiment exemplified in Figures 1 - 2c illustrates a combination of these possibilities.

[0043] In order to achieve a "glow-in-the-dark" effect that will last an appreciable amount of time for the user, the photoluminescent portions (7, 7', 7") are formed from a phosphorescent material. Usually, the phosphorescent portions (7, 7', 7") are manufactured so as to continue to emit light for a predetermined period of time following cessation of illumination of the light source. However, it is also possible to provide a phosphorescent material that will continue to emit light for 1 to 2 hours, or over 2 hours, following cessation of illumination of the light source. This feature is predetermined by the manufacturer of the apparatus (1). It will also be appreciated by the skilled person that if external light sources are present and illuminated while the at least one light source of the apparatus is not, the photoluminescent portions (7, 7', 7") may emit light for the predetermined period of time following cessation of illumination of the external light sources.

[0044] Referring now to Figures 3a - f, the motion sensor (5) is provided so as to detect movement of the apparatus (1) and most typically the housing (3) in at least one axis of movement (19). The motion sensor most typically is provided so as to detect movement of the apparatus in two axes of movement (19, 21). Figures 3a - f illustrate the various ways by which the apparatus may be moved by a user in order for the motion sensor (5) to detect movement in the various axes (19, 21) to trigger illumination of the light source., such as lifting, shaking, tipping and rolling. Figure 3c illustrates that non-movement of the apparatus (1) for a given period of time will result in the light source being switched off and this can be achieved by the provision of a timer (not shown) which starts counting when the light source is illuminated until the predetermined non movement end time is reached, but the count is stopped and restarted if movement of the apparatus is detected in that time period. Upon detection of movement of the apparatus (1) by the motion sensor (5), the light source is illuminated. Thus, it is movement of the apparatus (1) and/or the housing (3) itself that is detected by the motion sensor (5), which is typically located within the housing which acts as a trigger to illuminate the light source. The movement which is detected may, for example, be a tilting action as the user moves the apparatus from an at rest position on a surface such as a desktop, to a tilted position. Thus, the motion sensor which is used is, in one embodiment, an axis tilt switch which, when the tilt detected is to a sufficient degree, causes an electrical connection to be made to cause the illumination of the light source by connection of the light source to a power supply may be a mains power supply connected to the housing or one or more power cells located within the housing. Thus the motion sensor effectively acts as the on off switch for the apparatus.

[0045] In an alternative embodiment, instead of the light source being stopped from illumination by a detected period of non movement, a further detected movement of the apparatus can cause the light source to not be illuminated. The further detected movement of the apparatus may be the same movement or type of movement which is detected to initially cause the light source to be illuminated or alternatively may be a different form of movement, along or about a different axis to that which is used to cause the illumination of the light source. In this case the same or a further motion sensor means may be provided and, if two sensors are provided one acts as a means for switching the light source on and the other acts as a means for switching the light source off when movement is detected.

[0046] In a further embodiment additional motion sensors are provided which are capable of causing illumination when motion is detected by other objects or persons within a range of the housing in addition to or alternatively

to the detection of movement of the housing.

Claims

1. A light apparatus, said apparatus including a housing; at least one light source located therein and wherein said apparatus further includes motion sensing means, said at least one light source illuminated upon detection by said motion sensing means of movement of the apparatus.

2. A light apparatus according to claim 1 wherein said at least one light source ceases to illuminate after a predetermined period of non-movement of the apparatus.

3. A light apparatus according to claim 1 wherein said at least one light source is caused to stop illuminating by a further detected movement of the apparatus.

4. Apparatus according to claim 1 wherein the detected movement is movement of the housing of the apparatus.

5. Apparatus according to claim 1, wherein after the light source ceases to illuminate, one or more portions of the apparatus and/or items associated with the apparatus are provided to emit light for a period of time following the cessation of illumination of the light source and/or following the cessation of illumination of one or more light sources external of the apparatus.

6. Apparatus according to claim 5, wherein the one or more portions associated with the apparatus are formed of photoluminescent material.

7. Apparatus according to claim 6, wherein said one or more photoluminescent portions are provided as one or more phosphorescent portions.

8. Apparatus according to claim 5, wherein said period of time is in the range of 10-30 minutes.

9. Apparatus according to claim 1, wherein light from the at least one light source can pass towards a first end of the apparatus.

10. Apparatus according to claim 9, wherein said first end comprises a substantially transparent portion, such that light illuminated from said at least one light source is emitted from the apparatus through said portion.

11. Apparatus according to claim 1, wherein said housing comprises, at least in part, at least partially transparent walls through which light can pass to externally of the apparatus.

12. Apparatus according to claim 9, wherein blocking means are provided to selectively prevent light emission through at least one end of the apparatus.

13. Apparatus according to claim 2, wherein the predetermined period of non-movement of said housing prior to cessation of illumination of said at least one light source is between 10 seconds and 30 minutes.

14. Apparatus according to claim 1, wherein when the light source is caused to cease to illuminate, said at least one light source fades gradually from full illumination (on) to no illumination (off) in a predetermined period of time.

15. Apparatus according to claim 1, wherein the motion sensing means detects movement of the apparatus with respect to at least one axis of movement.

16. Apparatus according to any of the preceding claims wherein the apparatus is selectively usable as a night light or a torchlight.

17. Apparatus according to any of the preceding claims wherein the apparatus includes a switch which can be operated to perform an on and off function on the light source, independently of the sensing means.

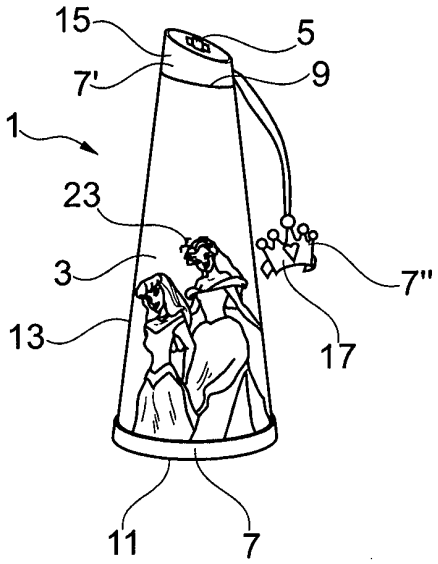

Fig. 1

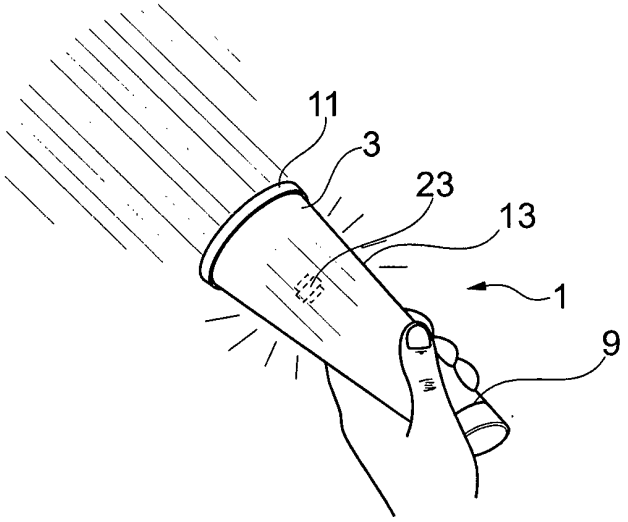

Fig. 2a

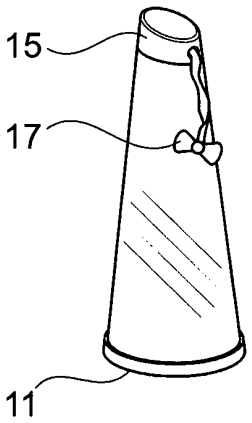

Fig. 2b

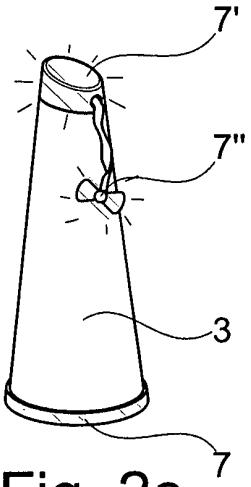

Fig. 2c

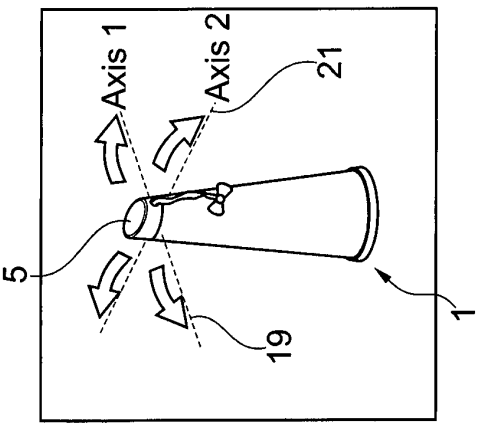

Fig. 3a

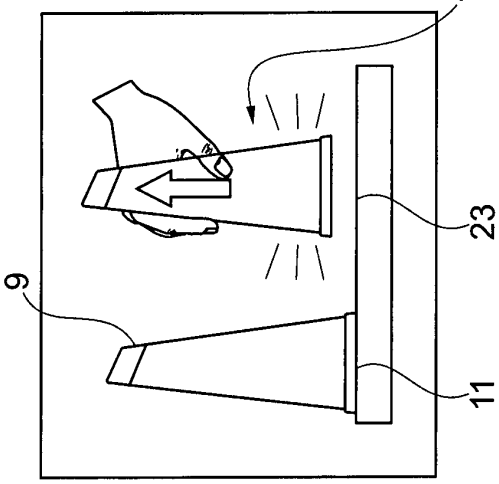

Fig. 3b

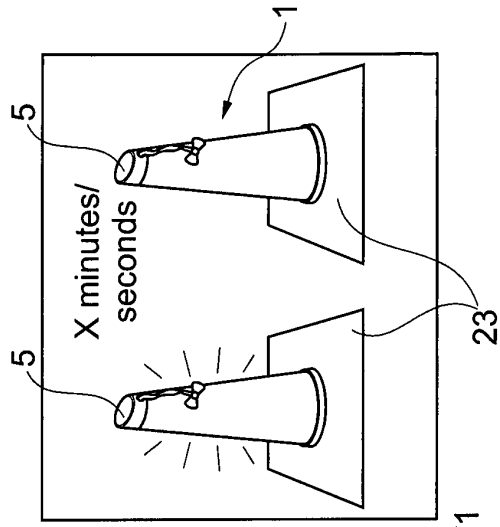

Fig. 3c

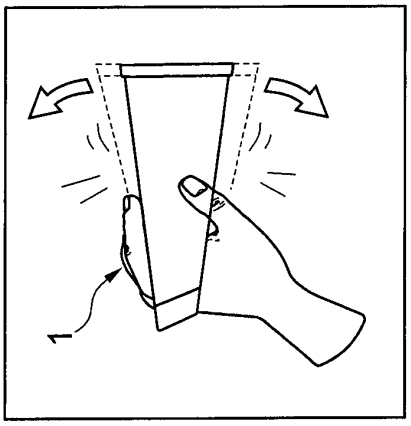

Fig. 3d

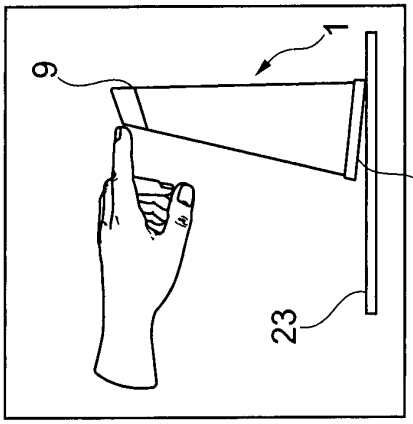

Fig. 3e

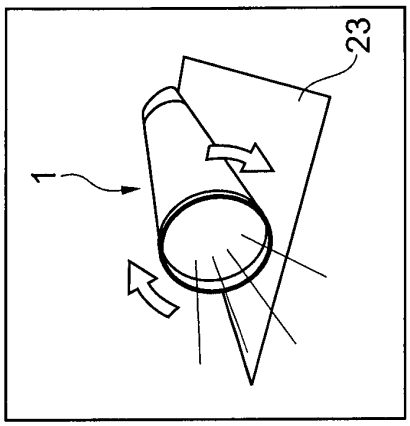

Fig. 3f

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EUROPEAN SEARCH REPORT

Application Number
EP 14 19 1636

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 Y	WO 2010/083047 A1 (MAG INSTR INC [US]; MAGLICA ANTHONY [US]; WEST STACEY H [US]; NATHANSO) 22 July 2010 (2010-07-22) * page 10, line 5 - line 8 * * page 38, line 7 - line 14 * * page 48, line 33 - page 49, line 2 * * page 53, line 30 - line 33 * * page 57, line 20 - line 35 * * figures 1-4, 9F, 10C *	1-10, 13-17 11	INV. F21V23/04 F21L4/00 F21V9/16 ADD. F21Y101/02
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