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United States Patent Application Publication

20250258393

Kind Code

A1

Publication Date

August 14, 2025

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ROD FOR DEVICE AND WEARABLE DEVICE COMPRISING SUCH A ROD

Abstract

Rod (**100**) for device, comprising: a main portion (**110**) having an inner cavity defining a housing seat (**120**); at least one electronic component (**130**) adapted to be inserted into said housing seat (**120**) and adapted to be extracted from the housing seat (**120**); an extraction aid element (**140**) of said at least one electronic component (**130**), adapted to switch from a closing configuration, wherein said extraction aid element (**140**) is housed in the housing seat (**120**), to an opening configuration, wherein said extraction aid element (**140**) is at least partially extracted from said housing seat (**120**).

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Family ID: 90924444

Appl. No.: 19/020081

Filed: January 14, 2025

Foreign Application Priority Data

IT	102024000002752	Feb. 09, 2024
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Publication Classification

Int. Cl.: G02C11/00 (20060101); G02B27/01 (20060101); G02C5/14 (20060101)

U.S. Cl.:

Background/Summary

[0001] The present invention refers to a rod for device.

[0002] The present invention also relates to a smart wearable device comprising such a rod.

[0003] Wearable device means any type of device designed to be worn in front of at least one eye of the wearer and with a frame configured to be mounted on the head of the wearer.

[0004] For simplicity of explanation and treatment, reference will be made to smart glasses below.

[0005] As is known, smart glasses, also referred to as intelligent glasses, virtual glasses, or digital glasses, mean a pair of glasses comprising electronic devices adapted to operate as a computer, i.e., capable of providing support for the activities performed by the user wearing them, whether in daily and private settings or in work and corporate settings, or in any other specific context.

[0006] Such components allow, for example, to play video, audio, record, operate IT applications, recognize natural language, shapes and objects disposed in the surrounding environment.

[0007] Generally, known smart glasses provide that the electronic and/or electric components are integrated in the frame of the glasses.

[0008] The electronic and/or electric components are adapted to be electrically powered by a battery, in some cases removable, also integrated in the frame. The battery can be rechargeable.

[0009] Typically, it is necessary to replace the battery in order to extend the useful life of the glasses in which it is installed or to ensure the continuity of operation of the smart glasses in cases where there is no access to charging sources.

[0010] Removing the battery from the glasses also allows to facilitate the disposal and recycling of the battery itself. Indeed, the entire pair of smart glasses is not replaced and disposed, but only the battery.

[0011] Some known smart glasses comprise a seat formed, for example, in a rod of glasses, adapted to receive the battery so as to protect it from shocks and external agents such as water and dust.

[0012] Typically, in order to retain the battery in such a seat, it is known to use closing doors fixable to the rod by fixing means, for example, screws, or other connection means, for example, glue or adhesives. Replacing the battery is, therefore, cumbersome, as it requires the use of tools, for example, screwdrivers, or solvents or thermal energy, to remove the doors and extract the battery.

[0013] The object of the present invention is to overcome the above-mentioned drawbacks, and in particular to ideate a rod for device and a device comprising such a rod which allow an easy installation and extraction of a battery, in order to replace it.

[0014] These and other objects according to the present invention are achieved by making a rod for device and a device comprising such a rod as set forth in claim 1 and in claim 13, respectively.

[0015] Further features of the rod for device are the object of the dependent claims.

[0016] The features and advantages of a rod for device and a device comprising such a rod according to the present invention will be more apparent from the following exemplary and non-limiting description referred to the attached schematic drawings in which:

Description

[0017] FIG. 1 is a perspective view of a rod for device according to the present invention, wherein the rod comprises a locking system;

[0018] FIG. 2 is a bottom view of the rod of FIG. 1;

[0019] FIG. 3 is an exploded perspective view of a rod for device according to a first embodiment of the present invention;

[0020] FIG. 4 is a sectional view of the rod according to the first embodiment along the sectional line II-II of FIG. 2;

[0021] FIG. 5a is a side view, partially transparent, of the rod of FIG. 3, wherein an electronic component is inserted into the rod, and the locking system is made according to a preferred embodiment;

[0022] FIG. 5b is a side view, partially transparent, of the rod of FIG. 5a, wherein the electronic component is extracted from the rod;

[0023] FIG. 6 is a sectional view along the sectional line VI-VI of the rod of FIG. 5a;

[0024] FIG. 7 is a sectional view along the sectional line VII-VII of the rod of FIG. 5a;

[0025] FIG. 8 is an exploded perspective view of a rod for device according to a second embodiment of the present invention;

[0026] FIG. 9 is a sectional view of the rod according to the second embodiment along the sectional line II-II of FIG. 2;

[0027] FIG. 10a is a side view, partially transparent, of the rod of FIG. 8, wherein the electronic component is inserted into the rod;

[0028] FIG. 10b is a side view, partially transparent, of the rod of FIG. 10a, wherein the electronic component is extracted from the rod;

[0029] FIG. 11 is a sectional view along the sectional line XI-XI of the rod of FIG. 10a;

[0030] FIG. 12 is a sectional view along the sectional line XII-XII of the rod of FIG. 10a;

[0031] FIG. 13a is a perspective view of a particular embodiment of a device according to the present invention, comprising only one rod according to the present invention;

[0032] FIG. 13b is a first perspective view of the device of FIG. 13a, comprising two rods according to the present invention, wherein the electronic component is extracted from both rods;

[0033] FIG. 13c is a perspective view of the device of FIG. 13a, comprising two rods according to the present invention, wherein the electronic component is extracted from only one of such rods;

[0034] FIG. 13d is a second perspective view of the device of FIG. 13b.

[0035] With reference to the figures, a rod for device, overall indicated by **100**, is shown.

[0036] The rod **100** is associable with a front **310** of a device **300**, such as, for example, a pair of smart glasses **300**. The rod **100** can be rotatably coupled to such a front **310** or made as a single piece therewith.

[0037] The rod **100** comprises a main portion **110** having an inner cavity open towards the outside, defining a housing seat **120**.

[0038] In particular, the housing seat **120** is defined by a bottom wall **121** and a perimeter wall **122**.

[0039] The rod **100** comprises at least one electronic component **130** adapted to be inserted into the housing seat **120** and adapted to be extracted from the housing seat **120**.

[0040] Preferably, said electronic component **130** can be, for example, a rechargeable battery.

[0041] Preferably, as shown in the figures, the at least one electronic component **130** comprises a covering casing **131** in which the at least one electronic component **130** itself is housed.

[0042] The rod **100** comprises an extraction aid element **140** of the at least one electronic component **130**, adapted to switch from a closing configuration, wherein the extraction aid element **140** is housed in the housing seat **120**, to an opening configuration, wherein the extraction aid element **140** is at least partially extracted from the housing seat **120**.

[0043] Furthermore, the extraction aid element **140** is also adapted to switch from the opening configuration to the closing configuration.

[0044] The extraction aid element **140** is configured to push the at least one electronic component **130** out of the housing seat **120** in the opening configuration.

[0045] When the extraction aid element **140** is in the closing configuration, the at least one

electronic component **130** is completely inserted into the housing seat **120**.

[0046] When the extraction aid element **140** is in the opening configuration, the at least one electronic component **130** is at least partially outside the housing seat **120**. Preferably, the extraction aid element **140** is substantially L-shaped and comprises a head **141** and a cantilevered portion **142** extending from the head **141**.

[0047] In an alternative embodiment not illustrated in the figures, the extraction aid element **140** is substantially C-shaped.

[0048] The cantilevered portion **142** is adapted to be interposed between the bottom wall **121** of the housing seat **120** and the at least one electronic component **130** in the closing configuration.

[0049] In particular, the cantilevered portion **142** can also be shaped to be in contact with the at least one electronic component **130** in the closing configuration.

[0050] Preferably, the rod **100** comprises a locking system **150** engageable to the at least one electronic component **130** to maintain the at least one electronic component **130** in the housing seat **120** when the extraction aid element **140** is in the closing configuration.

[0051] The locking system **150** thus prevents the at least one electronic component **130** and the extraction aid element **140** from being unintentionally extracted from the housing seat **120**.

[0052] Preferably, the locking system **150** comprises a constraint element **151** configured to engage to/disengage from said at least one electronic component **130**.

[0053] Preferably, the locking system **150** is adapted to switch from a locking configuration, wherein the constraint element **151** is engaged with the at least one electronic component **130**, to an unlocking configuration, wherein the constraint element **151** is disengaged from the at least one electronic component **130**.

[0054] Preferably, the at least one electronic component **130** can have, as illustrated in the figures, a seat **134** adapted to receive the constraint element **151** in the locking configuration.

[0055] Preferably, the locking system **150** comprises a manual command element **153** facing towards the outside of the main portion **110**, configured to engage/disengage the constraint element **151** to/from said at least one electronic component **130**.

[0056] The manual command element **153** can be moved by a user to allow the locking system **150** to switch from the locking configuration to the unlocking configuration, and vice versa.

[0057] For example, the manual command element **153** can be a button that can be pressed by a user such that the constraint element **151** disengages from the at least one electronic component **130**, to switch the locking system from the locking configuration to the unlocking configuration.

[0058] In this case, the manual command element **153** is at least partially protruding from the main portion **110**.

[0059] Furthermore, for example, the manual command element **153** can be a fixing element, such as a screw or a rivet, or a known pressure element. In this case, the manual command element **153** is completely inserted into the main body **110**.

[0060] Preferably, as shown in the figures, the manual command element **153** can be a linear slider adapted to slide in a slotted guide **154** formed on the main portion **110**, such that the locking system **150** switches from the locking configuration to the unlocking configuration and vice versa.

[0061] Still more preferably, in a preferred embodiment of the locking system **150**, as shown in FIG. **5a**, the locking system **150** also comprises a first elastic element **152** connected to the housing seat **120** on one side and to the part opposite to the constraint element **151** on the other side.

[0062] In this case, the first elastic element **152** is connected to the perimeter wall **122**.

[0063] The first elastic element **152** is arranged to push the constraint element **151** such that the latter engages with the at least one electronic component **130**.

[0064] Preferably, the first elastic element **152** is preloaded in compression with a first preloading force. In this case, first elastic element **152** maintains the constraint element **151** pushed against the at least one electronic component **130** when the locking system **150** is in the locking configuration.

[0065] In the preferred embodiment of the locking system **150**, the manual command element **153**

is configured to compress the first elastic element **152** so as to disengage the constraint element **151** from the at least one electronic component **130**.

[0066] In the preferred embodiment of the locking system **150**, during the switching of the locking system **150** from the locking configuration to the unlocking configuration, the manual command element **153** is forced to slide in the slotted guide **154**, so as to load in compression the first elastic element **152** with a compression force greater than the first preloading force. In this way, the constraint element **151** disengages from the at least one electronic component **130** due to the sliding of the manual command element **153**.

[0067] Still in the preferred embodiment of the locking system **150**, the locking system **150** can switch from the unlocking configuration to the locking configuration by releasing the manual command element **153**. By doing so, the first elastic element **152** extends due to the loaded compression force and pushes the constraint element **151** to engage with the at least one electronic component **130**.

[0068] When the locking system **150** is in the unlocking configuration, the extraction aid element **140** can switch from the closing configuration to the opening configuration and vice versa.

[0069] In a first embodiment of the rod **100**, shown in FIGS. 3-7, the head **141** is rotatably coupled around a hinging axis to the main portion **110** inside the inner cavity. Preferably, still in the first embodiment, and in the case where the rod **100** comprises the locking system **150**, the rod **100** comprises a second elastic element **160** arranged to exert a first thrust force on the at least one electronic component **130**.

[0070] In more detail, as shown in FIG. 4, the second elastic element **160** is connected to the housing seat **120** on one side and is configured to be in contact with the extraction aid element **140** on the other side.

[0071] Preferably, the second elastic element **160** is housed in the housing seat **120** on the side opposite to the locking system **150**.

[0072] In particular, the second elastic element **160** is connected on one side to the perimeter wall **122** and on the other side to the head **141**.

[0073] The second elastic element **160** is configured to push the head **141** such that the extraction aid element **140** is forced to switch from the closing configuration to the opening configuration when the locking system **150** is in the unlocking configuration.

[0074] Preferably, the second elastic element **160** is preloaded in compression with a second preloading force.

[0075] Preferably, when the extraction aid element **140** is in the closing configuration, the second elastic element **160** pushes against the head **141** with the second preloading force. In this case, if the locking system **150** is in the locking configuration, the extraction aid element **140** cannot switch to the opening configuration. Preferably, when the extraction aid element **140** is in the closing configuration and the locking system **150** is switched from the locking configuration to the unlocking configuration, the second elastic element **160** extends and pushes the head **141** due to the first thrust force, which is equal to the second preloading force. In this case, the cantilevered portion **142** draws in rotation the at least one electronic component **130**, which is thereby guided to be extracted from the housing seat **120**.

[0076] Thus, the first thrust force facilitates the extraction of the at least one electronic component **130** during the switching of the extraction aid element **140** from the closing configuration to the opening configuration. In a second embodiment of the rod **100**, shown in FIGS. 8-12, the head **141** is configured to at least partially elastically deform so as to exert a second thrust force on the at least one electronic component **130**.

[0077] In this case, preferably, the head **141** has a first portion **141'** and a second portion **141''** connected to each other.

[0078] The first portion **141'** is constrained to the main body **110**, preferably inside the inner cavity of the housing seat **120**.

[0079] The second portion **141''** is connected to the cantilevered portion **142**.

[0080] The first portion **141'** and the second portion **141''** substantially make an elastic element, in particular two ends of an elastic element; they can assume a close position, wherein said elastic element is loaded with an elastic force, and a spaced position.

[0081] In detail, the loading elastic force of said elastic element tends to move the second portion **141''** away from the first portion **141'**, causing them to switch from the close position to the spaced position.

[0082] When the extraction aid element **140** is in the closing configuration, the first portion **141'** and the second portion **141''** are in the close position and exert the second thrust force on the at least one electronic component **130**.

[0083] When the extraction guide element **140** is in the opening configuration, the first portion **141'** and the second portion **141''** are in the spaced position.

[0084] Preferably, when the extraction aid element **140** is in the closing configuration, and the locking system **150** is switched from the locking configuration to the unlocking configuration, the second portion **141''** moves away from the first portion **141'** and pushes the at least one electronic component **130** with the second thrust force. Furthermore, the cantilevered portion **142**, which is connected to the second portion **141''**, draws in rotation the at least one electronic component **130**, which is thereby guided to be extracted from the housing seat **120**.

[0085] The second thrust force thus facilitates the extraction of the at least one electronic component **130** during the switching of the extraction aid element **140** from the closing configuration to the opening configuration. Preferably, the at least one electronic component **130** comprises first electric contacts **132** configured to face second electric contacts **133** when the at least one electronic component **130** is inserted into the housing seat **120**, and the extraction aid element **140** is in the closing configuration.

[0086] In the first embodiment, the second electric contacts **133** are associated with the extraction aid element **140**. More specifically, preferably as shown in FIG. 4, the second electric contacts **133** are disposed on a wall **143** of the head **141** facing towards the at least one electronic component **130** when the at least one electronic component **130** is inserted into the housing seat **120**. In the second embodiment, the second electric contacts **133** are associated with the housing seat **120**. In this case, the first portion **141'** and the second portion **141''** have respective holes **144**, configured to be disposed in correspondence with each other when the at least one electronic component **130** is inserted into the housing seat **120**. The first electric contacts **132** reach the second electric contacts **133** through the holes **144**. Advantageously, the rod **100** can be mounted on the device **300** or made as a single piece therewith.

[0087] The device **300** comprises the front **310** and at least one rod **100** associated with the front **310**.

[0088] Preferably, the device **300** is wearable.

[0089] In a specific embodiment, shown in FIGS. **13a**, **13b**, **13c**, and **13d**, the device **300** is a pair of smart glasses **300**, comprising the front **310** adapted to carry at least one lens and two rods associated with the front **310**. Preferably, as shown in FIG. **13a**, only one rod of the smart glasses **300** is a rod **100** in accordance with the present invention.

[0090] Preferably, as shown in FIGS. **13b**, **13c**, and **13d**, both rods of the smart glasses **300** are two rods **100** in accordance with the present invention.

[0091] From the description provided, the features of the rod for device and a device comprising such a rod, which are the object of the present invention, are clear, as are the related advantages.

[0092] The extraction aid element facilitates the extraction and installation of the at least one electronic component in the rod.

[0093] Finally, it is clear that the rod for device and the device thus conceived are susceptible of numerous modifications and variants, all falling within the invention; furthermore, all details are

replaceable by technically equivalent elements. In practice, the materials used, as well as the dimensions, can be any depending on the technical requirements.

Claims

1. Rod (100) for device comprising: a main portion (110) having an inner cavity defining a housing seat (120); at least one electronic component (130) adapted to be inserted into said housing seat (120) and adapted to be extracted from the housing seat (120); an extraction aid element (140) of said at least one electronic component (130) adapted to switch from a closing configuration, wherein said extraction aid element (140) is housed in the housing seat (120), to an opening configuration, wherein said extraction aid element (140) is at least partially extracted from said housing seat (120).
2. Rod (100) according to claim 1, wherein said extraction aid element (140) is adapted to switch from said opening configuration to said closing configuration.
3. Rod (100) according to claim 1, wherein said at least one electronic component (130) is a rechargeable battery.
4. Rod (100) according to claim 1, wherein said extraction aid element (140) is configured to push the at least one electronic component (130) out of the housing seat (120) in the opening configuration.
5. Rod (100) according to claim 1, wherein said extraction aid element (140) is substantially L-shaped and comprises a head (141) and a cantilevered portion (142) extending from said head (141); said cantilevered portion (142) being adapted to be interposed between a bottom wall (121) of the housing seat (120) and the at least one electronic component (130) in the closing configuration.
6. Rod (100) according to claim 1, comprising a locking system (150) engageable to the at least one electronic component (130) to maintain said at least one electronic component (130) in said housing seat (120) when the extraction aid element (140) is in the closing configuration.
7. Rod (100) according to claim 6, wherein said locking system (150) comprises: a constraint element (151) configured to engage to/disengage from said at least one electronic component (130); a manual command element (153) facing towards the outside of said main portion (110) configured to engage/disengage said constraint element (151) to/from said at least one electronic component (130).
8. Rod (100) according to claim 7, wherein the locking system (150) comprises a first elastic element (152) connected to the housing seat (120) on one side and to the part opposite to the constraint element (151) on the other side, said first elastic element (152) being arranged to push the constraint element (151) such that the latter engages with the at least one electronic component (130).
9. Rod (100) according to claim 6, comprising a second elastic element (160) arranged to exert a first thrust force on said at least one electronic component (130).
10. Rod (100) according to claim 5, wherein said head (141) is rotatably coupled around a hinging axis to the main portion (110) inside the inner cavity.
11. Rod (100) according to claim 1, wherein the at least one electronic component (130) comprises first electric contacts (132) configured to face second electric contacts (133) when said at least one electronic component (130) is inserted into the housing seat (120) and said extraction aid element (140) is in the closing configuration, said second electric contacts (133) being associated to the extraction aid element (140).
12. Rod (100) according to claim 5, wherein the head (141) is configured to at least partially elastically deform so as to exert a second thrust force on said at least one electronic component (130).
13. Device (300) comprising: a front (310), at least one rod (100) associated to said front (310),

said rod (100) comprising: a main portion (110) having an inner cavity defining a housing seat (120); at least one electronic component (130) adapted to be inserted into said housing seat (120) and adapted to be extracted from the housing seat (120); an extraction aid element (140) of said at least one electronic component (130) adapted to switch from a closing configuration, wherein said extraction aid element (140) is housed in the housing seat (120), to an opening configuration, wherein said extraction aid element (140) is at least partially extracted from said housing seat (120).

14. Device (300) according to claim 13, wherein said device (300) is wearable.
