
Battery receiving compartment

The invention relates to a battery receiving compartment for a 9 V battery or accumulator and a microphone and/or electronic apparatus, in particular wireless, portable hand transmitters, pocket transmitters, receivers and radio sets having a battery receiving compartment.

Battery receiving compartments are known in which batteries having different sizes owing to tolerances are adjusted by means of filling or insulating material which more or less fixes the battery in its place. Often foamed material is used to this end which owing to its low mechanical durability and fast decreasing flexibility has a short working life.

It is another known solution to tightly screw the battery in the receiving compartment, wherein the size tolerance is adjusted by tightening the screws accordingly. The tightening pressure of the battery axially impacting on the support can be so high that a sliding of the battery in lateral direction is almost excluded.

It is an object of the invention to further develop the battery receiving compartment of the mentioned type such that batteries and accumulators having different sizes owing to tolerances do not clatter in the battery receiving compartment even in case of shock load. It must be ensured that the battery is secured in each possible direction of motion in order to avoid clattering noises. This is compulsory, in particular, for apparatus with built-in microphones which make even clattering noises of low volume increasingly audible. A mechanically durable solution which can be handled easily is required.

The problem is solved by the mentioned battery receiving compartment according to the invention comprising at least one fixing device and a mainly concave-shaped side on which the battery abuts and its sides are supported.

It is an advantage of the invention that, in addition to the required mechanical features and the avoidance of clattering noises, simple and quick handling is guaranteed. For the professional use it must be possible to change the battery with the shortest possible delay and without tools; it is a must that while the apparatus is being operated the electrical contact of the battery functions and the battery does not clatter.

According to a preferred embodiment of the battery receiving compartment the concave-shaped side is formed by several sections arranged at angles in respect of each other. The concave shape of the side ensures that two edges of the batteries having different sizes owing to tolerances always abut on the side and thus do not slide. This function is also achieved if the marginal portions of the side are inclined and the middle portion is plane. The plane middle portion must be smaller than the minimum size of the battery and the inclined marginal portions must extend the side such that a size of at least the maximum size of the battery is obtained.

According to the invention, the fixing device of the battery receiving compartment is most preferably provided in the form of a pretensioned springy element which ensures that also with different battery sizes the required stressing load acts on the used batteries without necessitating any mechanical adjustments.

An advantageous embodiment of the invention provides that at least one side is formed such as to be foldable and/or removable. Thus, the battery can be easily exchanged without the use of tools.

According to a suitable further embodiment of the battery receiving compartment the first side is formed such as to be foldable and, for the purpose of fixing, engages with a holding device arranged opposite a link. This arrangement allows a square battery, for instance a 9 V battery, to be held by only two springy holding devices. The tolerances of the lengths of two edges are adjusted by the two springy holding devices and, at the same time, the battery is held in these two directions of motion. The tolerance of the length of the remaining third edge is adjusted by the special shape of the side and, at the same time, the battery is fixed in this third direction of motion.

It is preferred that the first side of the battery receiving compartment according to the invention is held in the holding device by means of a force acting thereon such that the foldable side is not released from the holding device in the event of shaking or any other shock load. This would result in the loss of the battery which, in turn, would cause the entire apparatus to cease functioning.

It is particularly preferred to generate the force required for securing the foldable side in the holding device by means of a fixing device acting on the battery. The use of the spring power for fixing the battery and the countervailing power for holding the foldable side in the holding device advantageously reduce the cost involved with the manufacture and material used for the apparatus.

According to a further embodiment of the battery receiving compartment according to the invention at least one side is provided with a contact, in particular for a 9 V battery or accumulator, by means of which a safe electrical connection between the contacts of the battery and those of the battery receiving compartment can be realised.

It is particularly preferred to equip a microphone or an electronic apparatus, in particular wireless hand transmitters, pocket transmitters, receivers and radio sets with a battery receiving compartment according to the invention. Portable apparatus are regularly equipped

with batteries or accumulators for power supply. Portable apparatus are often moved and thus are exposed to higher shock load. The battery receiving compartment according to the invention effectively prevents the sliding of the battery and the clattering noises resulting therefrom.

Preferred embodiments of the invention are characterised by the features of the subclaims. In the following, the invention is explained on the basis of the drawings.

Fig. 1 shows a longitudinal view of the first embodiment of a battery receiving compartment according to the invention with battery;

Fig. 2 shows a cross-section of the battery receiving compartment according to Fig. 1 with a small battery;

Fig. 3 shows a cross-section of the battery receiving compartment according to Fig. 1 with a large battery;

Fig. 4 shows a longitudinal view of the microphone with an open battery receiving compartment according to the invention and a battery.

Fig. 5 shows a longitudinal view of the microphone according to Fig. 4 with a closed battery receiving compartment;

Fig. 6 shows a cross-section of the microphone according to Fig. 5;

Fig. 7 shows a cross-section of a second embodiment of the battery receiving compartment according to the invention;

Fig. 8 shows a longitudinal view of the battery receiving compartment according to Fig. 7 with a battery.

Figures 1 to 3 illustrate a first embodiment of the battery receiving compartment 1 of a microphone according to the present invention which is equipped with a battery or an

accumulator 2. It comprises a foldable side 4 flexibly connected through a link 13 to a fixing device 11 and engaging with a holding device 9 for the purpose of fixing.

The fixing device 11 arranged at the battery receiving compartment 1 in the closed state of the battery receiving compartment 1 exerts a pressure on the battery 2 and thus avoids that batteries of different sizes slide in the direction of motion 10, the direction of action of the force of the fixing device 11. At the same time the countervailing power of the fixing device 11 results in the side 4 not jumping out of the holding device 9.

A battery contact 15 which is also provided in the form of a fixing organ, in the closed state pushes the battery 2 against the side 4 and thus ensures the electrical connection between the contacts of the battery 2 and those of the battery receiving compartment 1. Since the contact 15 is movable, the size tolerances of the battery are adjusted in longitudinal direction, the sliding of the battery in the direction of motion 8 is avoided and it is ensured that the battery is safely secured against the side 4.

A mainly concave-shaped inner surface of the side 4 serves to adjust size tolerances and to fix the battery 2 in the direction of motion 12. Figs. 2 and 3 illustrate the shaping sections 5-7 of the side 4 and how they interact with the battery 2. A narrow battery 2 having a minimum size (Fig. 2) closely reaches section 7 and its sides are held by sections 5, 6 arranged at angles.

If the battery 2 is broader, as shown in Fig. 3, its edges rest on the angular sections 5, 6 in the area of the side 4 corresponding to the width of the battery. A distance 14 between the battery 2 and the section 7 of the side 4 as well as a deviating length of the battery is adjusted by the movable contact 15.

Tests have shown that the battery receiving compartment according to the invention solves the problems of securing batteries having different sizes owing to tolerances in every possible direction of motion and thus avoiding clattering noises. The battery receiving compartment according to the invention also solves the problem of providing a mechanically durable device which can be handled easily.

Figures 4 to 6 show a microphone having a battery receiving compartment 1 according to the invention with a battery 2, a torsion spring 11, a spring-supported contact 15 and a first, mainly concave-shaped side 4 on which the battery 2 abuts and its sides are supported.

The microphone comprises a top shell 17 and a bottom shell 19 which basically form the battery receiving compartment 1. Figure 4 illustrates the microphone with open battery receiving compartment. In order to open the microphone, a cover 21 is removed and then the receiving compartment of the microphone along with the bottom shell 19 is pulled out of the top shell 17 for rendering the battery receiving compartment 1 accessible. The torsion spring 11 which in the closed state is wedged in between the top shell 17 and the battery 2 tilts towards the outside. In this state the battery 2 can be easily taken from the battery receiving compartment 1 of the microphone.

Figure 5 shows a longitudinal view of the microphone according to Fig. 4, wherein the battery receiving compartment is closed. In this state the battery 2 is pretensioned towards the side 4 through the springy contact 15. At the same time, a safe electrical connection between the contacts of the battery 2 and those of the battery receiving compartment 1 is thus ensured. Owing to the fact that the contact 15 is movable, the size tolerance of the battery 2 is additionally adjusted in longitudinal direction and it is avoided that the battery slides in longitudinal direction.

The torsion spring 11 viewed from the side is mainly v-shaped, wherein one lateral section of the torsion spring 11 in the closed state of the battery receiving compartment 1 is pretensioned towards the battery 2 and the other lateral section towards the top shell 17. In Figure 5 it is indicated that in the relieved state the torsion spring 11 is spread wider than the room available between the battery 2 and the top shell 17 allows. The pretension of the torsion spring 11 towards the battery 2 is created when the battery receiving compartment is closed and in the process the torsion spring is squeezed between the battery 2 and the top shell 17.

Figure 6 illustrates the mainly concave-shaped inner surface of the side 4 formed by the side sections 5 to 7. The concave-shaped inner surface of the side 4 serves to ensure that the width tolerances of the battery are adjusted and the battery is tightly secured.

Figures 7 and 8 show a second embodiment of the battery receiving compartment 1 according to the present invention. The battery receiving compartment comprises a spring-supported contact 15, a fixed cover 23, a fixing device 11 and an inner surface of the side 4 mainly concave-shaped through the side sections 5 to 7. According to a second embodiment the battery receiving compartment 1 is basically produced by synthetic injection moulding. The fixing device 11 is basically tongue-shaped and in the relieved state protrudes into the interior of the battery receiving compartment 1, if compared to the fixing device 11 indicated by the dotted line in Fig. 8. If a battery 2 is inserted into the battery receiving compartment 1, the fixing device 11 is pushed towards the exterior and thus the battery 2 is pretensioned towards the fixed cover 23. Similar to the other embodiments of the battery receiving compartment 1 according to the invention, the basically concave-shaped inner surface of the side 4 adjusts width tolerances of the battery 2 and thus ensures that the sides of the battery 2 are supported in the battery receiving compartment 1.

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List of reference numbers

- 1 battery receiving compartment
- 2 battery or accumulator
- 4 side
- 5 section of the side 4
- 6 section of the side 4
- 7 section of the side 4
- 8 direction of motion
- 9 holding device
- 10 direction of motion
- 11 fixing device
- 12 direction of motion
- 13 link
- 14 distance
- 15 contact
- 17 top shell
- 19 bottom shell
- 21 cover
- 23 cover

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**Claims****THIS SHEET HAS BEEN
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1. Battery receiving compartment (1) for batteries (2) of different sizes, comprising at least one fixing device (11, 15) and one first side (4), which is mainly concave-shaped, on which the battery (2) abuts and its sides are supported.
2. Battery receiving compartment (1) according to claim 1, characterised in that the mainly concave-shaped side (4) is formed by several sections (5, 6, 7) arranged at angles in respect of each other.
3. Battery receiving compartment (1) according to any of the preceding claims, characterised in that the fixing device (11, 15) is a springy element pretensioned towards the interior.
4. Battery receiving compartment (1) according to any of the preceding claims, characterised in that at least one side (4) is built such as to be foldable and/or removable.
5. Battery receiving compartment (1) according to claim 4, characterised in that the first side (4) is foldable and, for means of fixing, engages with a holding means (9) arranged opposite the link (13).
6. Battery receiving compartment (1) according to claim 5, characterised in that the first side (4) is held in the holding means (9) through an impacting force.
7. Battery receiving compartment (1) according to claim 6, characterised in that the force is generated by the fixing device (11) acting upon the battery (2).
8. Battery receiving compartment (1) according to any of the preceding claims, characterised in that at least one side is provided with a contact (15), in particular for a 9 V battery or accumulator (2).
9. Microphone or electronic apparatus comprising a battery receiving compartment (1) according to any of the preceding claims.

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