

PATENT SPECIFICATION

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- (21) Application No. 18393/74 (22) Filed 7 July 1972
 (62) Divided out of No. 1 396 399
 (31) Convention Application No. 54 859/71 (32) Filed 22 July 1971 in
 (33) Japan (JA)
 (44) Complete Specification published 11 June 1975
 (51) INT. CL.³ H01M 2/10 2/34
 (52) Index at acceptance
 H1B D11X D7 D9C D9X
 H2E 3B9 3C2C 3C2E 3E10



(54) BATTERY APPARATUS

(71) We, KABUSHIKI KAISHA SUWA SEIKOSHA, a Japanese Company of 3-4, 4-chome, Ginza, Chuo-ku, Tokyo, Japan, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention concerns battery apparatus.

When electrical equipment is powered by a conventional dry battery or batteries, it is normally important to ensure that the batteries are located the right way round in housings provided therefor. Frequently, in fact, the equipment is marked to indicate which way round the batteries have to be placed. However, where space is extremely limited, as it is in an electrically operated timepiece such as a wrist watch, it may be very difficult to indicate which way round the batteries are to be inserted.

If, however, a battery is inserted the wrong way round, there is a risk that the battery will be short circuited and its power thus rapidly dissipated, while the incorrect disposition of the battery may result in the equipment driven thereby being inoperative, and may even damage the latter. There is also the risk of mechanical damage being caused by a careless user trying to force the battery in the wrong way round.

According to the present invention, there is provided apparatus comprising an elongated electric battery having first and second electrodes which are respectively constituted by a part of the outer casing of the battery and by a portion projecting laterally of the said outer casing, and terminal support structure adapted to receive at least a part of the battery when the latter is in both a first position and a second position, the terminal support structure comprising two spaced terminals of the

same polarity, which are respectively contacted by one of said electrodes in the said first and second positions, and a terminal of the opposite polarity which is contacted by the other of said electrodes in each said position.

Preferably, the said projecting portion projects outwardly of the said outer casing by an amount not less than one sixth of the width of the latter.

Preferably, in each said position, the battery is located, in part, by its engagement with insulating means.

The terminal of the said opposite polarity may engage an end of the outer casing of the battery in each of the two different positions of the latter.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:—

Figure 1 is a diagrammatic view of an apparatus according to the present invention, showing a battery therein in a first position, and

Figure 2 is a view corresponding to Figure 1, but showing the battery in a second position.

In Figure 1 there is shown battery apparatus comprising an electric dry battery 1 of elongated shape. The battery 1 has a projecting negative electrode 1a which projects laterally outwardly of, and is insulated from, the outer casing 1b of the latter. The projecting negative electrode 1a projects outwardly of the outer casing 1b by an amount which is preferably not less than one sixth of the width W of the battery 1. The outer casing 1b of the battery 1, and in particular an end 1c thereof, forms the positive electrode of the battery.

The battery 1 is disposed between upper insulating members 2 and lower insulating members 2a such that when the battery 1 is in the first position shown in Figure 1, its surface 1d contacts the upper insulating 90

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members 2, while, when the battery is in the second position shown in Figure 2, its surface 1d contacts the lower insulating members 2a. The end 1c is, both in the Figure 1 and in the Figure 2 position, in contact with a positive terminal 3 which is connected to a circuit 4 containing equipment (not shown) to be powered by the battery 1. The negative terminal of the circuit 4 is connected to contact members 5, 6 which are arranged on opposite sides of the battery 1.

As will be seen, in the first position shown in Figure 1, the negative electrode 1a contacts the terminal 6 and is spaced from the terminal 5, whereas in the second position shown in Figure 2, the negative electrode 1a contacts the terminal 5 and is spaced from the terminal 6. Thus, the battery 1 is correctly connected to the circuit 4, and will not itself be damaged, irrespective of whether it is placed in the first position shown in Figure 1 or in the second position shown in Figure 2.

The embodiment of the invention shown in the drawings is particularly suitable for use in an electric wrist watch where the lack of space makes it impossible to indicate very clearly how the battery is to be inserted.

WHAT WE CLAIM IS:—

1. Apparatus comprising an elongated electric battery having first and second electrodes which are respectively constituted by a part of the outer casing of

the battery and by a portion projecting laterally of the said outer casing, and terminal support structure adapted to receive at least a part of the battery when the latter is in both a first position and a second position, the terminal support structure comprising two spaced terminals of the same polarity, which are respectively contacted by one of said electrodes in the said first and second positions, and a terminal of the opposite polarity which is contacted by the other of said electrodes in each said position.

2. Apparatus as claimed in claim 1 in which the said projecting portion projects outwardly of the said outer casing by an amount not less than one sixth of the width of the latter.

3. Apparatus as claimed in claim 1 or 2 in which, in each said position, the battery is located, in part, by its engagement with insulating means.

4. Apparatus as claimed in any preceding claim in which the terminal of the said opposite polarity engages an end of the outer casing of the battery in each of the two different positions of the latter.

5. Apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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members 2, while, when the battery is in the second position shown in Figure 2, its surface 1d contacts the lower insulating members 2a. The end 1c is, both in the 5 Figure 1 and in the Figure 2 position, in contact with a positive terminal 3 which is connected to a circuit 4 containing equipment (not shown) to be powered by the battery 1. The negative terminal of the circuit 4 is connected to contact members 5, 6 which are arranged on opposite sides of the battery 1.

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25 The embodiment of the invention shown in the drawings is particularly suitable for use in an electric wrist watch where the lack of space makes it impossible to indicate very clearly how the battery is to be inserted.

30 WHAT WE CLAIM IS:—

1. Apparatus comprising an elongated electric battery having first and second electrodes which are respectively constituted by a part of the outer casing of

the battery and by a portion projecting laterally of the said outer casing, and terminal support structure adapted to receive at least a part of the battery when the latter is in both a first position and a second 40 position, the terminal support structure comprising two spaced terminals of the same polarity, which are respectively contacted by one of said electrodes in the said first and second positions, and a terminal 45 of the opposite polarity which is contacted by the other of said electrodes in each said position.

2. Apparatus as claimed in claim 1 in which the said projecting portion projects 50 outwards of the said outer casing by an amount not less than one sixth of the width of the latter.

3. Apparatus as claimed in claim 1 or 2 in which, in each said position, the battery is located, in part, by its engagement with insulating means.

4. Apparatus as claimed in any preceding claim in which the terminal of the said opposite polarity engages an end of the 60 outer casing of the battery in each of the two different positions of the latter.

5. Apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 65

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