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(56) Documents Cited  
GB 2352887 A WO 2001/022696 A  
US 5343136 A

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INT CL<sup>7</sup> H01M 10/46, H02J 7/00  
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(54) Abstract Title  
**Holster with battery for portable equipment**

(57) A holster 4 is provided to receive a piece of portable equipment 2 such as a mobile phone. The holster includes a rechargeable battery 26 which is used to provide a charge to a further rechargeable battery 20 in the piece of portable equipment 2 when it is received by the holster 4. Claims are included for a holster comprising a rechargeable battery and contacts for connecting the rechargeable battery to the portable equipment, a piece of portable equipment insertable into a holster, and a mobile phone system comprising a phone and a holster. Examples of batteries for the holster are: lithium ion prismatic cell with manganese spinel cathode, lithium ion prismatic cell with cobalt cathode, and fuel cell. The invention can be used with MP3 players, PDAs etc.

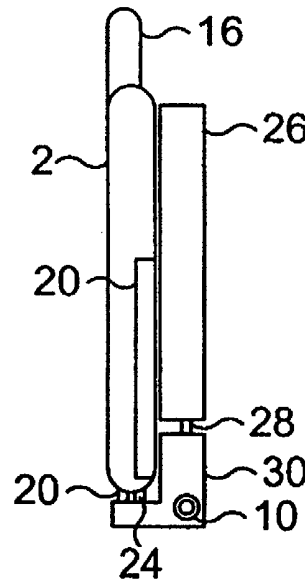


FIG. 4

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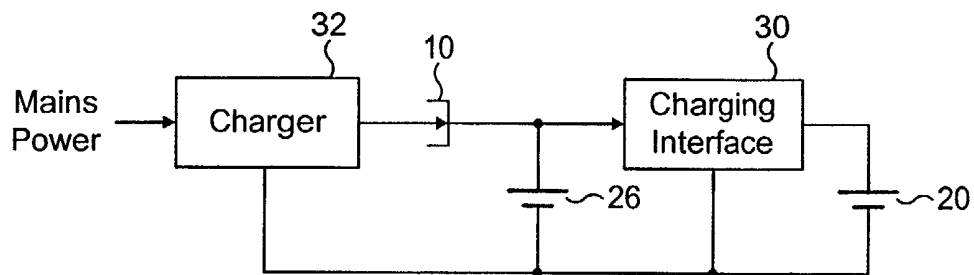
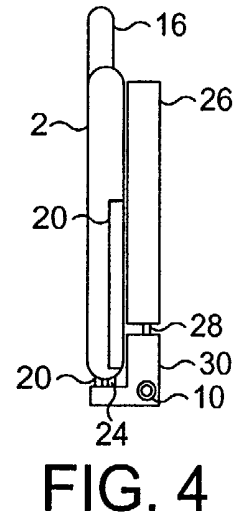
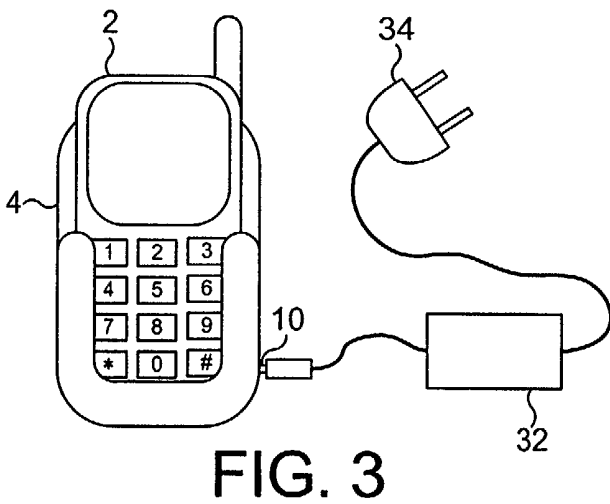
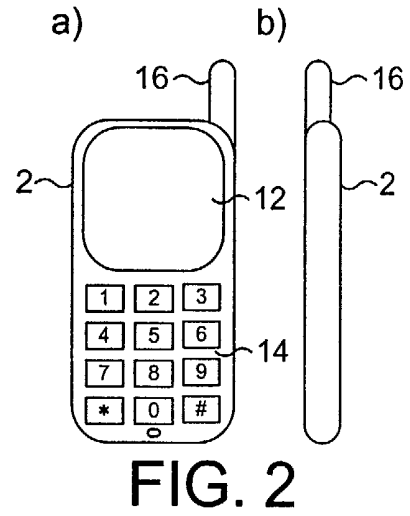
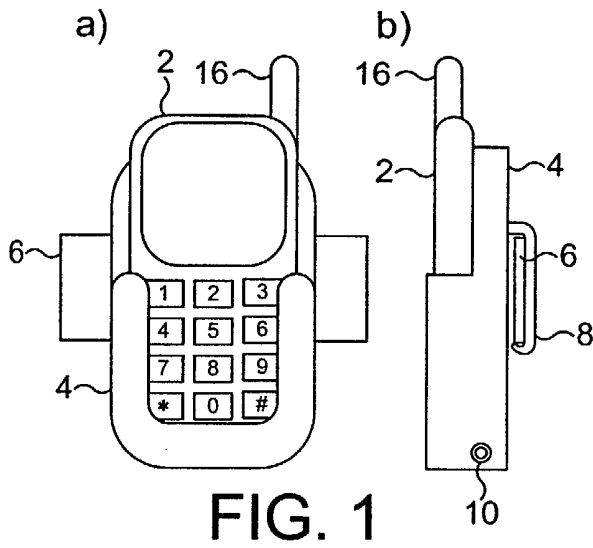


FIG. 5

**HOLSTER WITH BATTERY FOR PORTABLE EQUIPMENT**

This invention relates to a holster with battery for a piece of portable equipment such as a mobile phone.

5 Many items of portable equipment such as mobile phones are battery operated. In many areas, such as new developments in mobile telephones, the circuitry incorporated is towards the leading edge of current technology and tends to be power hungry. This increases  
10 the power requirements and larger batteries have to be incorporated making the equipment more bulky. This is a problem because consumers prefer compact portable equipment such as slimline mobile telephones which appear visually more advanced as well as being technologically  
15 more advanced. If large capacity batteries are incorporated then the bulk of the device is increased.

In accordance with an embodiment of the present invention, there is provided a holster for a portable device such as a mobile phone which contains a large  
20 capacity battery. The portable device has terminals which contact corresponding charging terminals on the mobile device when it is inserted into the holster. The portable device contains a smaller capacity battery which provides power for short periods when it is removed from the  
25 holster. When it is returned to the holster, the smaller capacity battery is topped up with charge from the larger capacity battery.

The holster includes a charger input for receiving power from an external charging source to recharge the  
30 large capacity battery.

An embodiment of the invention will now be described in detail by way of example with reference to the accompanying drawings in which:

**Figure 1a and 1b** show front and side views of a mobile phone in a holster clipped to a user's belt;

**Figure 2a and 2b** show front and side views of the mobile phone removed from the holster;

5 **Figure 3** shows a phone in a holster with an external charger connected to it;

**Figure 4** shows a cross-section of the phone in the holster; and

**Figure 5** shows the electrical charging circuit.

10 In Fig. 1 there can be seen a mobile phone 2 inserted in a holster 4. The holster is carried on the belt 6 of a user. The belt is received in a clip 8 on the rear of the holster. In the side view 1b, a socket to receive a charger input is shown.

15 Figs. 2a and 2b show the mobile phone 2 removed from the holster in front and side views respectively. The phone comprises a display 12, a key pad 14 and an antenna 16.

20 The phone 2 include a small internal battery 20 which can be seen in the cross-section of Fig. 4. Contacts 22 are provided on the base of the phone which mate with corresponding contacts 24 in the holster when the phone is inserted in the holster. The holster includes a large battery 26 which is connected via further battery contacts 25 28 to a charging interface 30. When the phone is inserted into the holster and contacts 22 and 24 mate with each other, charge from the large battery 26 passes to the small battery 20 via the contacts 28, the charging to the interface 30, and the contacts 22 and 24.

30 An external charger 32 which is coupled to mains power via a mains plug 34 can be connected to the charger input 10. When this happens it will charge the large battery 26. If the phone 2 is in the holster at the same

time, this also will be charged via the charging interface 30.

The electrical arrangement for charging is illustrated in Fig. 5 in which it can be see that the charger 32 is coupled by the charging connector 10 to the large battery 26 and the charging interface 30. Thus, when connected, the large battery is recharged. If the phone is in the holster at the same time, the small battery 20 will also be recharged.

When the charger 32 is disconnected from the charging connector 10, the large battery recharges the small battery 20 when the phone is inserted into the holster.

The large battery in the holster is chosen for maximum energy capacity. Its size is preferably significantly larger than the phone battery since it is not so visible and is not held in the hand. The stability of the terminal voltage it provides is not critical because the charging circuit 30 is arranged to regulate the charging current and voltage between the holster battery and the smaller voltage applied across contacts 24 for recharging the phone battery 20.

The phone battery 20 is chosen to have minimal thickness, size and low impedance in accordance with the dimensions of the phone. This enables the phone to have a compact slim-line design. The low impedance of the battery enables it to provide current pulses to the phone without the battery voltage dropping and giving a premature empty battery indication.

Preferably the batteries 26 and 20 are of different types as this is usually likely to produce a more satisfactory charging solution.

Examples of batteries for the holster are:

1. A lithium ion prismatic cell with manganese spinel cathode. This is the best choice for a large high

density cell in a portable application. Manganese is relatively inexpensive and there are abundant resources for it. A battery of this type has a high safety performance and therefore requires only simple protection devices.

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2. A lithium ion prismatic cell with cobalt cathode. This technology has a higher energy density than the manganese spinel but has higher cost and is less safe. It enables the thin cells in the 4mm to 6mm thickness range to be produced where the total energy is low.
3. One promising future technology which could be used is the fuel cell. This offers the largest energy density.

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The phone battery is preferably of the advanced lithium ion (alb) type. This is inherently safe and is manufacturable in very thin forms, e.g. 1 mm thick. This type of battery uses standard lithium ion technology and therefore has low impedance. A single cell would be suitable to power a mobile phone.

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The invention can be used with other forms of portable devices such as MP3 players, PDAs etc.

**CLAIMS**

1. A holster for receiving a piece of portable equipment that incorporates a first rechargeable battery, the holster comprising a second rechargeable battery for providing charge to the first rechargeable battery in the piece of portable equipment when it is received in the holster.
2. A holster according to claim 1 in which the second rechargeable battery is of larger energy capacity than the first rechargeable battery.
3. A holster according to claim 1 or 2 in which the second rechargeable battery is physically larger than the first rechargeable battery.
4. A holster according to any preceding claim in which the holster includes a charging input to receive power for recharging the second rechargeable battery.
5. A holster according to any preceding claim in which the second rechargeable battery is of the lithium ion prismatic cell type.
6. A holster according to claim 5 in which the second rechargeable battery has a manganese spinel cathode.
7. A holster according to claim 5 in which the second rechargeable battery has a cobalt cathode.
8. A holster according to any preceding claim in which the first rechargeable battery is of the advanced lithium on type.

9. A holster according to any preceding claim in which the piece of portable equipment is a mobile telephone.

5 10. A holster for a piece of portable equipment comprising a rechargeable battery and contacts for connecting the rechargeable battery to the piece of portable equipment.

11. A piece of portable equipment insertable into a holster and carrying electrical contacts to connect to corresponding contacts in the holster.

10 12. A mobile phone system comprising a phone and a holster, the phone including a first rechargeable battery, the holster including a second rechargeable battery which electrically connects to and charges the first  
15 rechargeable battery when the phone is inserted in the holster.

13. A holster for a mobile phone substantially as herein described with reference to the drawings.

14. A mobile phone substantially as herein described with reference to the drawings.





INVESTOR IN PEOPLE

**Application No:** GB 0205174.6  
**Claims searched:** 1-14

**Examiner:** Peter Keefe  
**Date of search:** 7 October 2002

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK CI (Ed.T): H2H (HBCH)  
Int CI (Ed.7): H02J (7/00), H01M (10/46)  
Other: Online: WPI, PAJ, EPODOC

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2352887 A VTECH p4 lines 6-11; p9 lines 12-21	1, 4-12
X	WO 01/22696 A SONY p4 lines 1-29; p5 lines 25-32; p6 line 9; p7 lines 1-3, 27-28	1-12
X	US 5343136 A KABUSHIKI KAISHA TOSHIBA column 2 lines 9-33, column 3 lines 26-35	1-12

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.