

(12) **UK Patent Application** (19) **GB** (11) **2478694** (13) **A**

(43) Date of A Publication

21.09.2011

(21) Application No: **0921830.6**
(22) Date of Filing: **14.12.2009**

(51) INT CL:
H02J 7/00 (2006.01) **H01M 10/44** (2006.01)

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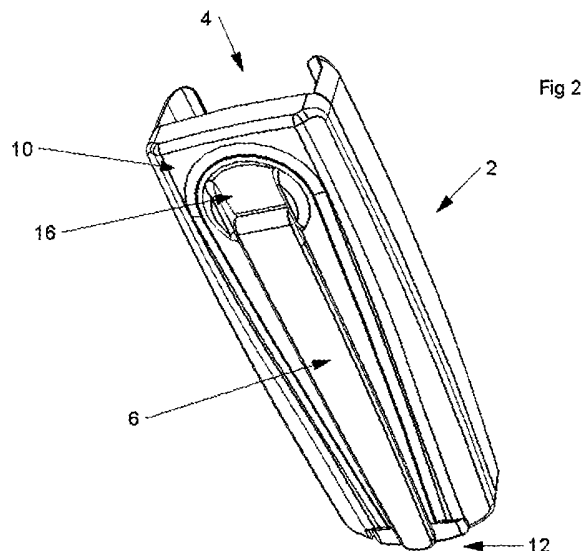
(58) Field of Search:
INT CL **H01M, H02J, H04B**
Other: **ONLINE: WPI, EPODOC**

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(54) Title of the Invention: **Charger**

Abstract Title: **Charger for charging a small electronic device having a manually operated wind up charging facility**

(57) A charger 2 for charging a battery of a small electronic device such as a mobile phone (8, fig 4), smart phone, a video player or MP3 player, the charger comprising an open sleeve-like facility 4 adapted in use to for enveloping a mobile phone (8). The charger 2 comprises a lever 12 pivotally mounted on an underside of a base housing 10. Rotation of the lever 12, when the charger is in use and a mobile phone 8 is placed in the facility 4, results in rotation of an alternator which provides charge to the battery of the small electronic device. The sleeve-like facility 4 of the charger 2 may be of moulded plastic construction, and flexible in nature. The charger may also be provided with an USB port or other electrical port to allow connection to another device such as a mobile device or a PC, handheld computer or notepad. The charger may also be provided with a chargeable battery which can be used to speed up the charging rate of the small electronic device.



GB 2478694 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 2007.

Fig 1

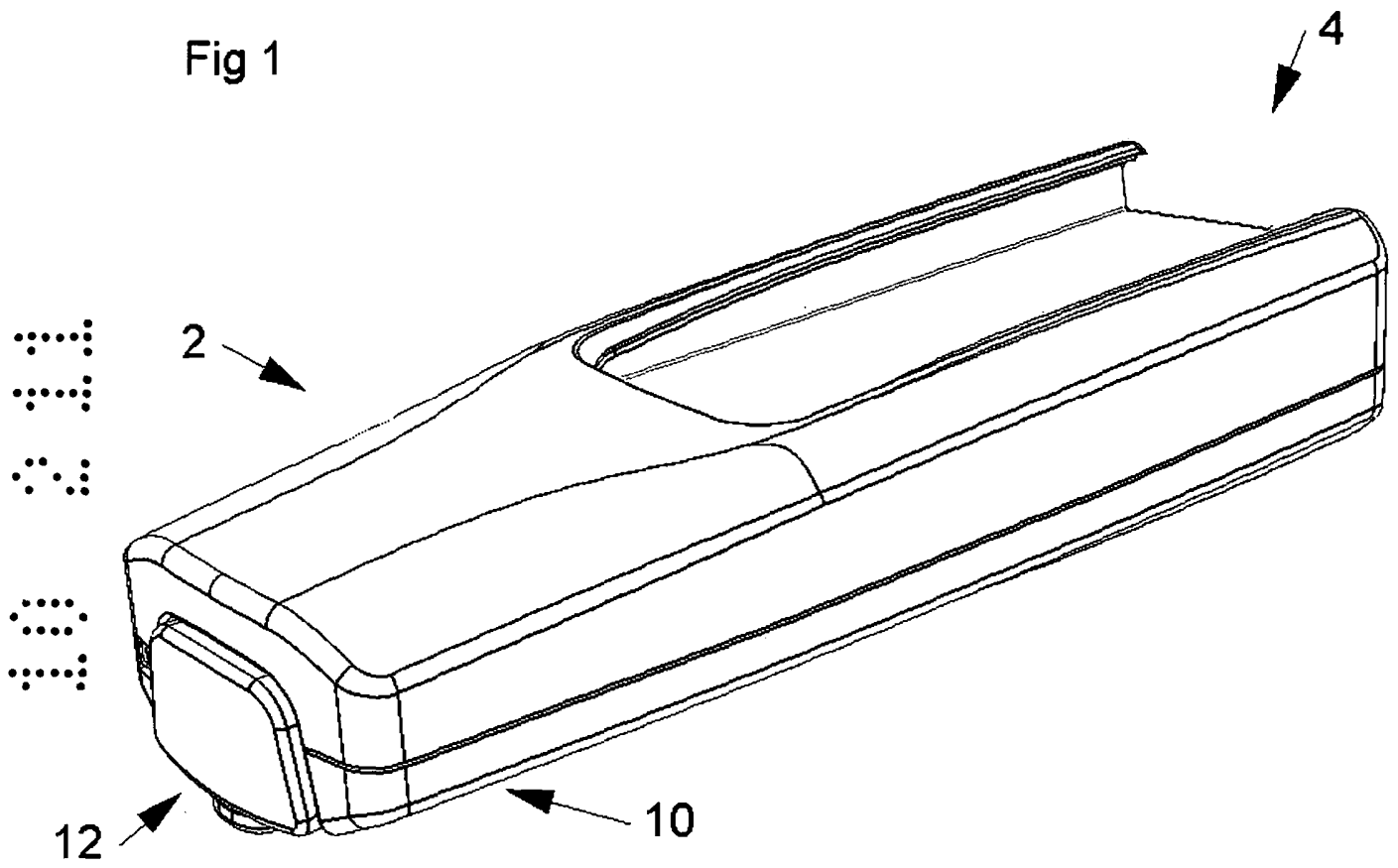
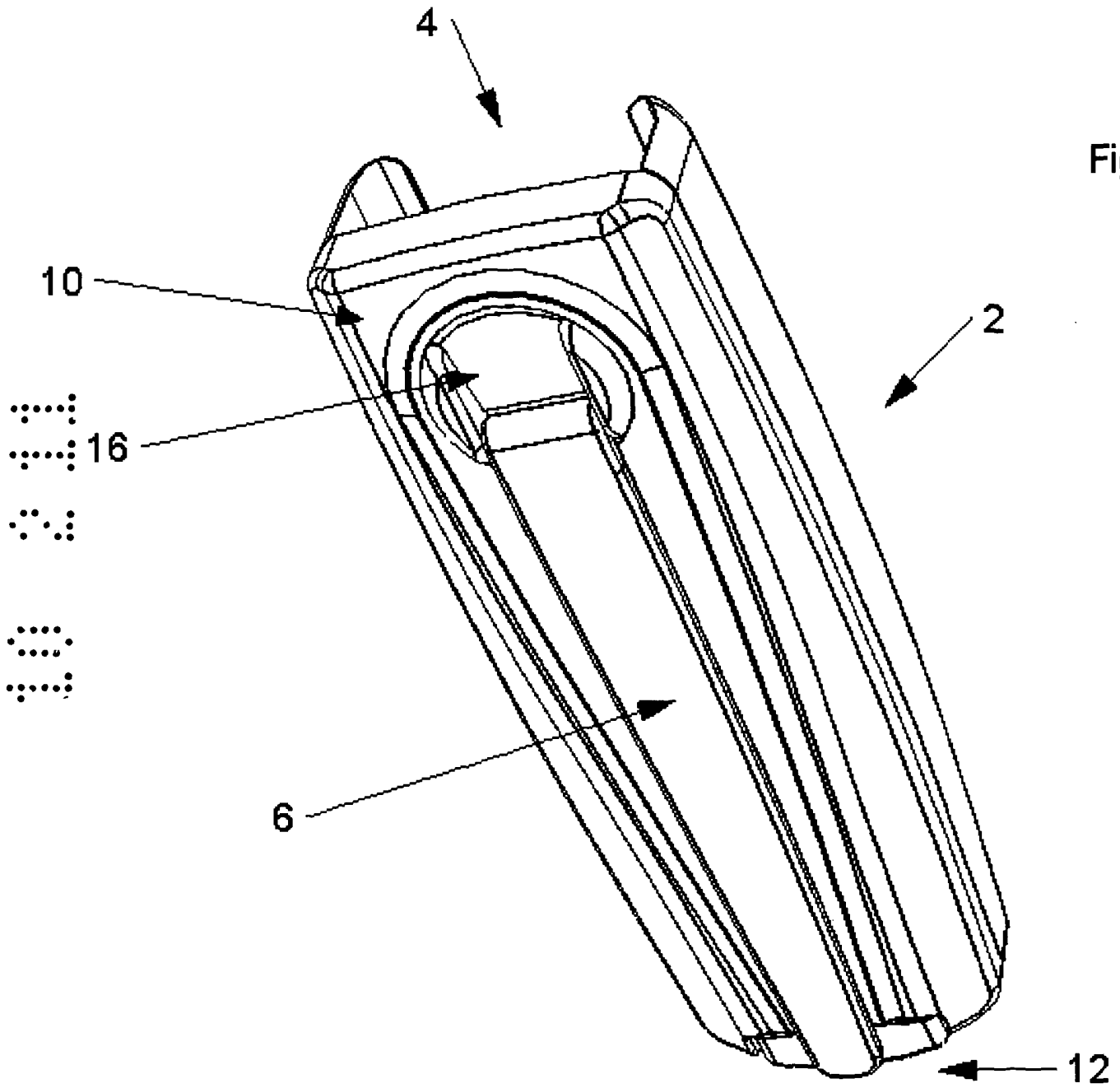
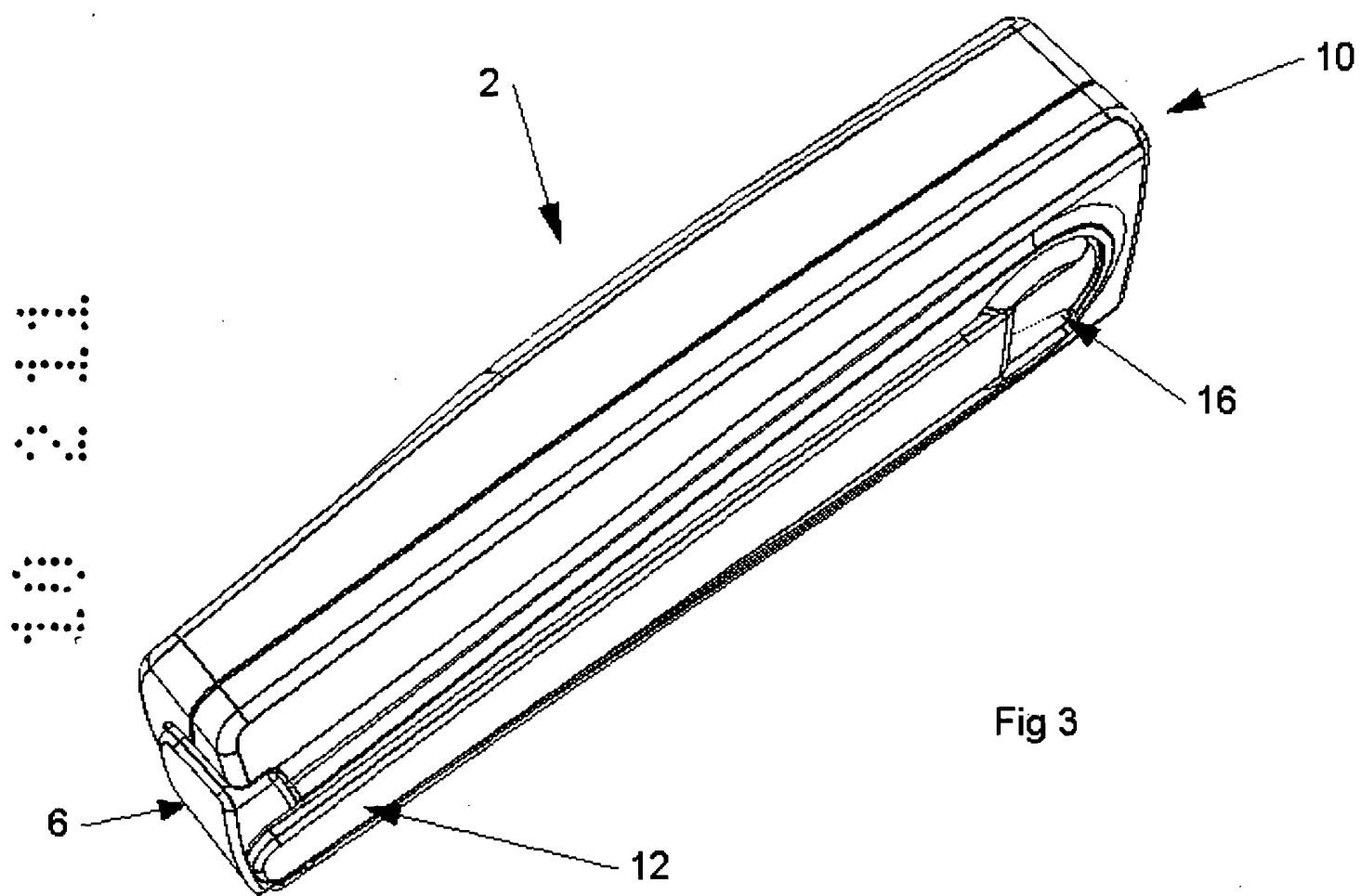


Fig 2



Sheet 3/4



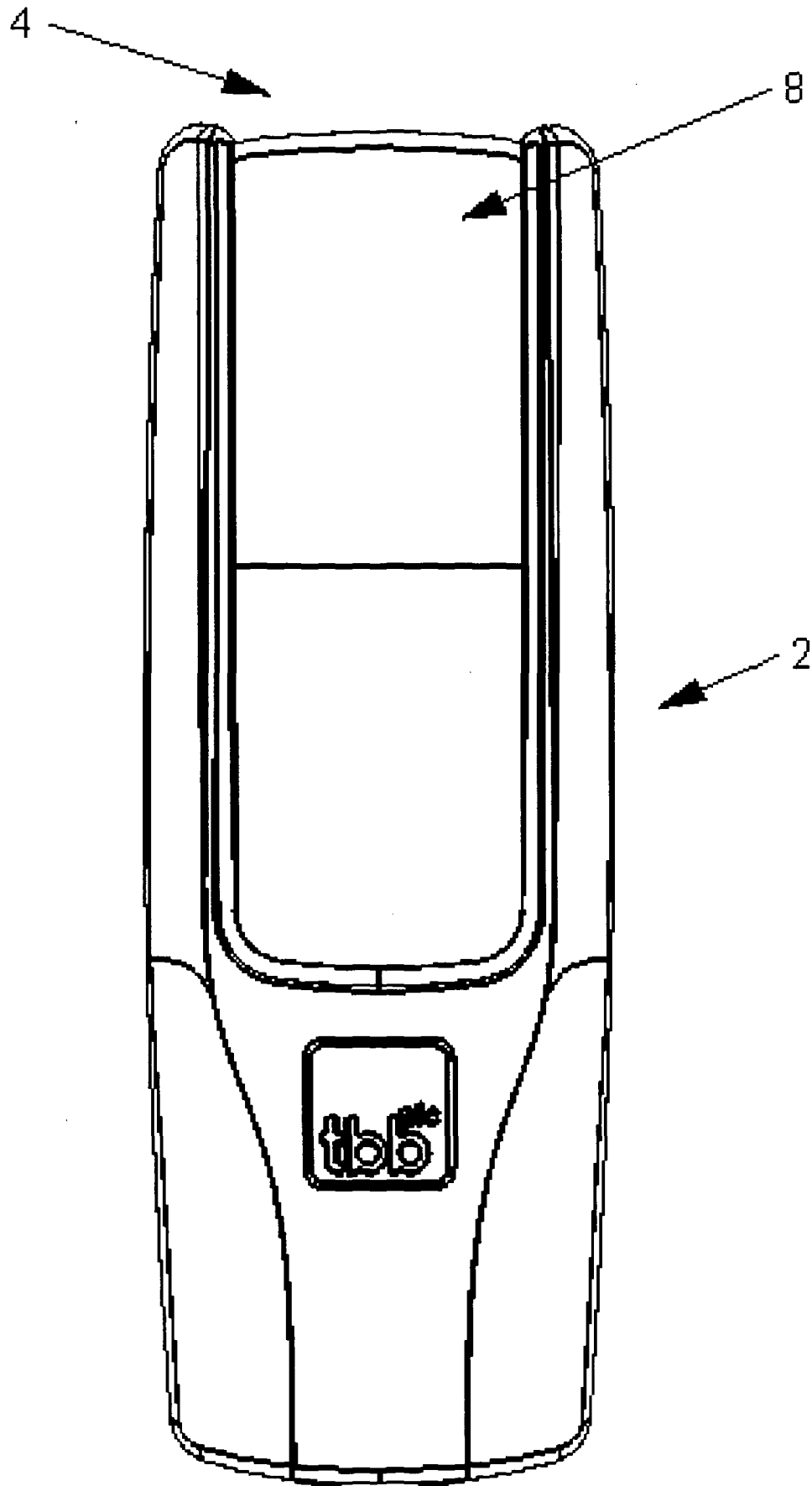
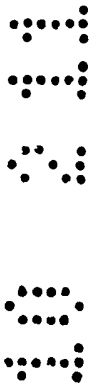


Fig 4



CHARGER

The present invention is concerned with improvements in or relating to a charger for charging the battery of a small electronic device such as a mobile phone, a smart phone, a video player or an MP3 player.

Small electronic devices as hereinbefore defined that have re-chargeable batteries may be connected to a source of electrical energy in the home, an office or elsewhere via a conventional charger that is connected to the small electronic device and the source of electrical energy, which conventional charger is adapted to provide charging energy at the correct rate for the battery included in the small electronic device.

When away from home or the office and an available source of electrical energy, it has become the practice to rely on a charger that may be manually operated to provide electrical energy through an electrical generator; for example, there are many commercially available wind-up generators that may be connected to small electronic devices as hereinbefore defined in order to re-charge the batteries thereof.

The reliance on manually operated chargers that are available hitherto would mean that anyone requiring to re-charge a small electronic device would have to also have ready access to a manually operable charger. Such chargers are bulky and are not aesthetically pleasing to the eye. In addition, the manually operated chargers are not tactile in that they are cumbersome when connected to a small electronic device as herein defined for re-charging the device.

It is therefore an object of the present invention to overcome or at least mitigate the drawbacks and disadvantages of available chargers.

Thus, the present invention conveniently provides a charger for charging a chargeable battery of a small electronic device, such as a mobile phone, a smart phone, a video player or an MP3 player, the charger comprising an open sleeve-like facility for

wholly enveloping, when in use, the small electronic device in said sleeve-like facility, or substantially so.

In one convenient embodiment provided by the present invention, the charger also comprises means for manually generating an electrical charge for charging, when in use as aforesaid, the chargeable battery of the small electronic device as hereinbefore defined..

Preferably, the means for manually generating an electrical charge comprises an integral actuator for operation of an electrical generator that is enclosed within a housing of the charger.

Conveniently, the integral actuator is a lever whereby, when the charger is in use as aforesaid, operation of the lever causes the electrical generator to generate electrical energy for re-charging the battery of the small electronic device as hereinbefore defined.

Preferably, when the charger is in use, rotary motion of the integral lever causes the electrical generator to generate electrical energy for charging the battery of the small electronic device as hereinbefore defined.

Conveniently, the charger comprises a moulded casing of a plastics composition.

In a preferred embodiment provided by the present invention, the plastics composition, from which the charger is moulded, is chosen so that, in use, the moulded casing exhibits a degree of flexibility that enables the insertion of a small electronic device as hereinbefore defined into the sleeve-like facility of the charger.

In a further embodiment provided by the present invention, the charger is provided with a USB port and/or another electrical port in order to facilitate:-

- a) connection of the charger to a further device, which may be a further mobile phone or other small electronic device that cannot be readily enveloped in the sleeve-like facility of the charger; or,
- b) connection of the charger to a PC, hand held computer or notepad.

In another embodiment provided by the present invention, the charger includes a chargeable battery wherein, when the charger is in use and a small electronic device as hereinbefore defined is inserted in the sleeve-like facility, and the electrical energy of the battery in the small electronic device is relatively low, in order to speed up the charging rate of the small electronic device, the chargeable battery of the charger is connected to the battery of the small electronic device to provide a burst of electrical energy thereto whereby subsequent charging of the small electronic device is effected more speedily and efficiently.

There now follows, by way of example of the invention, a detailed description, which is to be read with reference to the accompanying drawings in which:-

Figure 1 is an upper right hand perspective view of a charger according to the invention;

Figure 2 is an underside left hand perspective view of the charger of Figure 1;

Figure 3 is an underside right hand perspective view of the charger of Figures 1 and 2; and,

Figure 4 is a front view of the charger of Figures 1, 2 and 3 shown enveloping a small electronic device.

In order to provide a ready means of charging a small electronic device, for example a mobile phone, in areas where there is no access to mains electricity supply, the present invention provides a novel charger 2 that generally comprises an open sleeve-like facility 4 provided with an actuator 6, see Figures 1, 2 and 3,

actuation of which actuator 6, when the charger 2 is in use, will cause the generation of electrical energy for re-charging the battery of a mobile phone 8 located within the sleeve-like facility 4, see Figure 4.

Specifically, the charger 2 is a plastic moulding of a composition that provides a finished product with a degree of flexibility in order to ensure that a mobile phone 8 can be readily inserted into the open sleeve-like facility 4 as shown in Figure 4. Thus, the charger 2, which is readily held in one hand of a user, comprises a base housing 10 for an electrical generator, not shown, which is operated by the actuator 6, when the charger 2 is in use as aforesaid.

The actuator 6 is formed as a lever 12, which is pivotally mounted on an underside 14 of the housing 10, see Figures 2 and 3. As shown in Figures 2 and 3, the lever 12 is located in a closed, inoperative position.

The lever 12 is of convention design and is movable to an open, operative position, not shown, in which position the lever 12 may be rotated about a fulcrum point 16 whereby the electrical generator is operated to generate electrical energy for re-charging a mobile phone 8.

In operation of the charge 2, one revolution per second of the lever 12 will result in a rotation of 3000rpm at the alternator, not shown.

It will be obvious to the reader that the charger 2 is provided with contact points, not shown, within the confines of the sleeve-like facility for engagement, when the charger 2 is in use and a mobile phone 8 is enveloped therein, with corresponding contact points of the mobile phone 8 in order that electrical energy may be passed to a battery, not shown, of the mobile phone 8.

The charger 2 is also provided with a USB port and/or another electrical port whereby it may be connected to a power supply when there is access to such a resource. The same USB port may be used for re-charging the batteries of other



electronic devices, such as a mobile phone or smart phone that cannot readily be enveloped in the sleeve-like facility 4 of the charger 2.

The USB port and/or the electrical port of the charger 2 may also be used for connecting the charger 2 to a PC, hand held computer or notepad.

The charger 2 may include its own battery, not shown, whereby, in instances when the battery of a small electronic device is too low for efficient re-charging thereof without excessive start-up rotation of the lever 12, a booster charge can be initiated from the battery within the charger 2 to raise the level of the battery in the small electronic device in order to improve the subsequent charging rate of the battery of the small electronic device.

Although the use of the charger 2 has been described with reference to a mobile phone 8 as shown in Figure 4, it is envisaged that any small electronic device may be re-charged, such devices being a smart phone, a video player or an MP3 player and like products.

The charger 2 provided by the present invention overcomes the disadvantages of convention charging devices and apparatuses that are commercially available hitherto in that the charger 2 is readily held in one hand thereby enabling a user to wind the lever 12 with their other hand to re-charge the battery of a small electronic device that is enveloped within the charger 2.

In addition, the charger 2 is most useful when there are no sources of electrical energy close by, for example in many parts of Asia, Africa or South America.

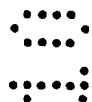
The charger 2 of the present invention is designed to be moulded as a waterproof unit and to be a close fit with any small electronic device enveloped thereby ensuring that the assemblage remains waterproof.

CLAIMS

1. A charger for charging a chargeable battery of a small electronic device, such as a mobile phone, a smart phone, a video player or an MP3 player, the charger comprising an open sleeve-like facility for wholly enveloping, when in use, the small electronic device in said sleeve-like facility, or substantially so.
2. A charger according to Claim 1, characterised in that the charger also comprises means for manually generating an electrical charge for charging, when in use as aforesaid, the chargeable battery of a small electronic device as hereinbefore defined..
3. A charger according to Claim 2, characterised in that the means for manually generating an electrical charge comprises an integral actuator for operation of an electrical generator that is enclosed within a housing of the charger.
4. A charger according to Claim 3, characterised in that, the integral actuator is a lever whereby, when the charger is in use as aforesaid, operation of the lever causes the electrical generator to generate electrical energy for re-charging the battery of the small electronic device as hereinbefore defined.
5. A charger according to Claim 4, characterised in that, when the charger is in use, rotary motion of the integral lever causes the electrical generator to generate electrical energy for charging the battery of the small electronic device as hereinbefore defined.
6. A charger according to any one of the preceding Claims, characterised in that, the charger comprises a moulded casing of a plastics composition.



7. A charger according to Claim 5, characterised in that, the plastics composition, from which the charger is moulded, is chosen so that, in use, the moulded casing exhibits a degree of flexibility that enables the insertion of a small electronic device as hereinbefore defined into the sleeve-like facility of the charger.
8. A charger according to any one of the preceding Claims, characterised in that, the charger is provided with a USB port and/or another electrical port in order to facilitate:-
 - a) connection of the charger to a further device, which may be a mobile phone or other small electronic device that cannot be readily enveloped in the sleeve-like facility of the charger; or,
 - b) connection of the charger to a PC, hand held computer or notepad.
9. A charger according to any one of the preceding Claims, characterised in that the charger includes a chargeable battery wherein, when the charger is in use and a small electronic device as hereinbefore defined is inserted in the sleeve-like facility, and the electrical energy of the battery in the small electronic device is relatively low, in order to speed up the charging rate of the small electronic device, the chargeable battery of the charger is connected to the battery of the small electronic device to provide a burst of electrical energy thereto whereby subsequent charging of the small electronic device is effected more speedily and efficiently.
10. A charger substantially as hereinbefore described with reference to the accompanying drawings.

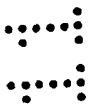


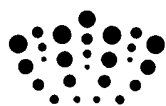
AMENDMENTS TO CLAIMS HAVE BEEN FILED AS FOLLOWS

1. A charger for charging a chargeable battery of a small electronic device, such as a mobile phone, a smart phone, a video player or an MP3 player, the charger comprising an open sleeve-like facility for wholly enveloping, when in use, the small electronic device in said sleeve-like facility, or substantially so, characterised in that the charger also comprises integral means for manually generating an electrical charge for charging, when in use as aforesaid, the chargeable battery of a small electronic device as hereinbefore defined, and wherein the means for manually generating an electrical charge comprises an integral actuator for operation of an electrical generator that is wholly enclosed within a housing of the charger.
2. A charger according to Claim 1, characterised in that, the integral actuator is a lever whereby, when the charger is in use as aforesaid, manual operation of the lever causes the electrical generator to generate electrical energy for re-charging the battery of the small electronic device as hereinbefore defined.
3. A charger according to Claim 2, characterised in that, when the charger is in use, rotary motion of the integral lever causes the electrical generator to generate electrical energy for charging the battery of the small electronic device as hereinbefore defined.
4. A charger according to any one of the preceding Claims, characterised in that, the charger comprises a moulded casing of a plastics composition.
5. A charger according to Claim 4, characterised in that, the plastics composition, from which the charger is moulded, is chosen so that, in use, the moulded casing exhibits a degree of flexibility that enables the insertion of a small electronic device as hereinbefore defined into the sleeve-like facility of the charger.



6. A charger according to any one of the preceding Claims, characterised in that, the charger is provided with a USB port and/or another electrical port in order to facilitate:-
 - a) connection of the charger to a further device, which may be a mobile phone or other small electronic device that cannot be readily enveloped in the sleeve-like facility of the charger; or,
 - b) connection of the charger to a PC, hand held computer or notepad.
7. A charger according to any one of the preceding Claims, characterised in that the charger includes a chargeable battery wherein, when the charger is in use and a small electronic device as hereinbefore defined is inserted in the sleeve-like facility, and the electrical energy of the battery in the small electronic device is relatively low, in order to speed up the charging rate of the small electronic device, the chargeable battery of the charger is connected to the battery of the small electronic device to provide a burst of electrical energy thereto whereby subsequent charging of the small electronic device is effected more speedily and efficiently.
8. A charger substantially as hereinbefore described with reference to the accompanying drawings.





Application No: GB0921830.6

Examiner: Dr Dilwyn Williams

Claims searched: 1-10

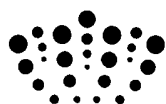
Date of search: 12 July 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-9	US2009/0302799 A1 (MARQUET) - Figures 3-5, Paragraphs 7, 8, 78 and 79
X	1-9	US6346791 B1 (BARGUIRDJIAN) - figures 4 and 6, paragraphs 27, 28
X	1 and 6	JP10146213 A (WAZAKI) figures 1 -15, English abstract.
X	1,6,8 and 9	EP1505801 A2 (LOWLES) - Figures 1-13, all of document.
X	1 and 6	US5610979 A (YU) - Fig 1-5, all of document
X	1-9	US 2009/0102418 A1 (GABER) - Figure 2, all of document.
X	1-6	CA2327892 A1 (PALMA) - figures 1-6, all of document
X	1 at least	DE202008008233 U1 (SHEN) - Figs 1-5 English abstract.
X	1 and 6	US 2010/0317413 A1 (TAN) - Figures 1-9 , all of document
A	---	US 2005/0248312 A1 (CAO) - Figs 1-3, all of document.
A	---	GB2456393 A (DAVIES) - Fig 1-6,8-9, all of document

Categories:



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.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

Worldwide search of patent documents classified in the following areas of the IPC

H01M; H02J; H04B

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC

International Classification:

Subclass	Subgroup	Valid From
H02J	0007/00	01/01/2006
H01M	0010/44	01/01/2006