Abstract: Disclosed is a self-charging mobile handset. Access to mobile phones plays a key part in poverty reduction; however, there are over 1.6 billion people who do not have direct access to electricity to charge mobile phones in Sub-Saharan Africa and South Asia. People in these countries may spend up to 6 hours a week walking to other villages to charge phones, or will pay local businessmen offering charging services to connect their phones to chargers connected to the mains supply. A simple and effective way to charge mobile phones is to use a squeeze type dynamo (8) into the housing, a phone (1) can be manufactured which is both self charging and low cost.
SELF-CHARGING ULTRA LOW COST MOBILE HANDSET

TECHNICAL FIELD

The present invention relates generally to telephony communications; and more specifically to an ultra low cost handset which is self-charging.

BACKGROUND ART

Access to mobile phones plays a key part in poverty reduction; however mobile phones however consume power when operational. A typical phone may last 3 or 4 days on standby, or even less than a day if it is heavily used. The phone then has to be connected to a charger which is typically plugged into an electricity socket, to enable the rechargeable battery located inside the phone handset housing to be recharged, to enable the phone to be used again.

According to the World Bank, there are over 1.6 billion people who do not have direct access to electricity to charge mobile phones in Sub-Sahara Africa and South Asia. Those people who are able to afford a phone handset may spend up to 6 hours a week walking to other villages to find electricity to charge phones, or they may pay local businessmen offering charging services to connect their phones to chargers connected to car batteries.

By implementing a low cost, and easy to use method, to charge a phone and by incorporating this into the handset housing itself, we can save the time spent by these people walking to villages to charge their handsets, or the money they spend on charging services. By saving money, we are helping these people get out of poverty.

A number of methods have been previously described in prior art to self-charge a mobile handset. There are a number of patents that describe the addition of a solar array to a mobile phone, however these types of arrays are typically very expensive, and are too expensive for poor communities where the phone handset itself may only cost $20-$30. US Patent 7,289,831 by Trozzi incorporates a hand crack dynamo into a handset housing, however it is believed that such an attachment onto a phone would be cumbersome to use. In US Patent Application
Ekchian et al have incorporated a dynamo into a handset housing with no external parts, however it is felt that this method would be too expensive to produce for a low cost handset.

Ding et al., in US Patent Application US2007/0177377 have incorporated a hand press dynamo into a flashlight. The specifications of these types of small dynamos has increased considerably to enable such a dynamo to be connected to a low powered mobile phone circuit.

The following USPTO patent documents reflect such prior background art:


US 2004/0204180 Al, Cellular Phone with Built-in Generator, Liao, Application Published Oct 14, 2004


US2007/0024233 Al, Armature Type Electrical Generators for Self Powered Cell Phones, Ekchian et al., Application Published Feb 1, 2007

US 2007/0177377 Al, Rechargeable Flashlight, Ding et al., Application Published Aug 2, 2007

DISCLOSURE OF INVENTION

The self-powered handset disclosed herein is an innovative concept which is both low cost and easy to use. By building a hand press dynamo into a low powered mobile handset housing, we can achieve both a low cost of manufacture and an easy to use phone charging system whereby the user would squeeze the hand press arm 3 or 4 times to enable the phone to charge to last for a few hours. In the poor communities in Sub-Sahara Africa and South Asia, people on average will make calls lasting at most two minutes, and will only call 10-15 times a month. This typical low usage is therefore matched very well to the type of self-charging described in this invention.
The above examples illustrate the use of a self-powered handset to make and receive a call, but the same handset could also be used to send and receive data, such as SMS messages or email. For example it is possible that the handset could be used as a remote data logger which is only required to be powered up and activated when it is required to download data using a wireless connection.

Although the method disclosed, by and large employs a series of general purpose components to achieve its ends, the bona fide distinctiveness of the invention resides in the combination of a hand press dynamo with a low powered mobile phone handset.

BRIEF DESCRIPTION OF DRAWINGS

The foregoing summary of the invention, as well as the following detailed description of the preferred embodiment, is better understood when read in conjunction with the accompanying drawings, which are included by way of example, and not by way of limitation with regard to the claimed invention:

Fig 1 is a front view of an exemplary handset with self charging handle in accordance with the present invention; and

Fig 2 is a rear internal view of an exemplary handset depicting the internal mechanism according to one embodiment of the present invention.

Fig 3 is a block diagram of the components functions of an exemplary handset incorporating the dynamo in accordance with the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Fig 1. Depicts an exemplary handset for use in a wireless telecommunications network which can be used for making and receiving voice calls and data. The operation of the handset in general will be described followed by a description of how the self-charging mechanism is implemented.
In Fig 1. The mobile handset housing 1 has cut aways to house an input keypad 3, a display 2 and a microphone and speaker. At the side of the handset is an arm 4, shown here in a released position, which when squeezed will charge the battery inside the handset.

Fig 2 shows a rear internal view of an exemplary handset in the preferred embodiment. When the arm 10 is squeezed by a hand holding the handset, gear 9 turns which in turn spins the dynamo 8. Once released the handle returns to its original position by virtue of a spring located in the handle. The arm can then be squeezed two or three more times in quick succession to enable the dynamo 8 to reach its normal operating speed of 1000-3000 rpm.

The dynamo 8 uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current through Faraday's law. At its normal operating speed, the dynamo will produce 5.0 V DC and will be connected to a charging circuit by a series of wires. A battery 6, which can be a Ni-MH, Nickel Cadmium or Lithium rechargeable battery is connected to the charging circuit. The charging circuit is equipped with diodes to protect the battery 6 from power spikes caused by the dynamo 8.

In the preferred embodiment, the battery 6 is located between the dynamo 8 and the main PCB housing the baseband signal processor, memory, power amplifier and RF components. In this manner the battery acts as a magnetic shield to protect the RF and other components from magnetic and flux fields caused by the dynamo. The handset is design for low cost and therefore the battery 6 can be glued into place rather than add unnecessary parts to enable the battery to be removed and changed.

Fig 3 shows a block diagram of the component functions of the handset in the preferred embodiment. The dynamo 21 charges the battery 18 through the power management and battery charger 17. The battery 18 powers the circuitry in the mobile handset. The circuitry includes an antenna 11 connected to a series of filters and a Transmit/Receive switch 12 which in turn is connected to a core baseband and signal processing chip 14. The user interacts with the processor by means of the display and keyboard 13. An authentication system 13 is located in the handset, in the case of a GSM handset this will include a Subscriber Identity Module (SIM card). A speaker 19 and a microphone 20 are connected to the baseband and signal processing chip by virtue of an audio switch 16 to enable the user to speak and hear voice conversations during a call over the mobile network.
While the foregoing describes what are considered to be the preferred embodiments of the invention, it is understood that various modifications may be made therein and that the invention may be implemented in various forms and alternate embodiments, and indeed that it may be applied in numerous applications, only some of which have been described. The claims are intended to cover all such modifications and variations which fall within the true scope of the invention.

INDUSTRIAL APPLICABILITY

In the preferred embodiment of the invention, mobile phone manufacturers may sell low cost, self charging handsets to people living in remote communities in Africa and Asia. Mobile operators will benefit economically since users will be able to make more outgoing calls and increase the amount of airtime they spend where they do not have access to regular electricity to charge phones.

The implementation of the system will also enabling people on low incomes to communicate more easily; reducing the costs of travelling to find places to charge phones and reducing money spent on charging.
The invention claimed is:

1. A handset for use in a mobile network comprising a housing, an input device, a processor, a radio transmitter and receiver, a network authentication system, a battery, a charging circuit, a dynamo electric generator, a plurality of gears connected to the dynamo and a squeeze handle connected to the plurality of gears wherein squeezing the handle charges the battery.

2. A handset as claimed in claim 1, wherein the handset makes and receives voice calls.

3. A handset as claimed in claim 1, wherein the handset receives non-voice data transmission.

4. A handset as claimed in claim 1, wherein the handset sends non-voice data transmission.

5. A handset as claimed in claim 1, wherein the dynamo, plurality of gears and squeeze handle are located in a separate housing from the handset, connected by a power cable.

* * * * *
INTERNATIONAL SEARCH REPORT

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INVENT. NO.

INTERNATIONAL SEARCH REPORT PCT/GB2010/050248

A CLASSIFICATION OF SUBJECT MATTER

INV. H02J7/32

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H020

Documentation searched other than minimum documentation and the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X Further documents are listed in the continuation of Box C

X See patent family annex

* Special categories of cited documents

'A' document defining the general state of the art which is not considered to be of particular relevance

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T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search

3 May 2010

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Authorized officer

Marannino, M
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