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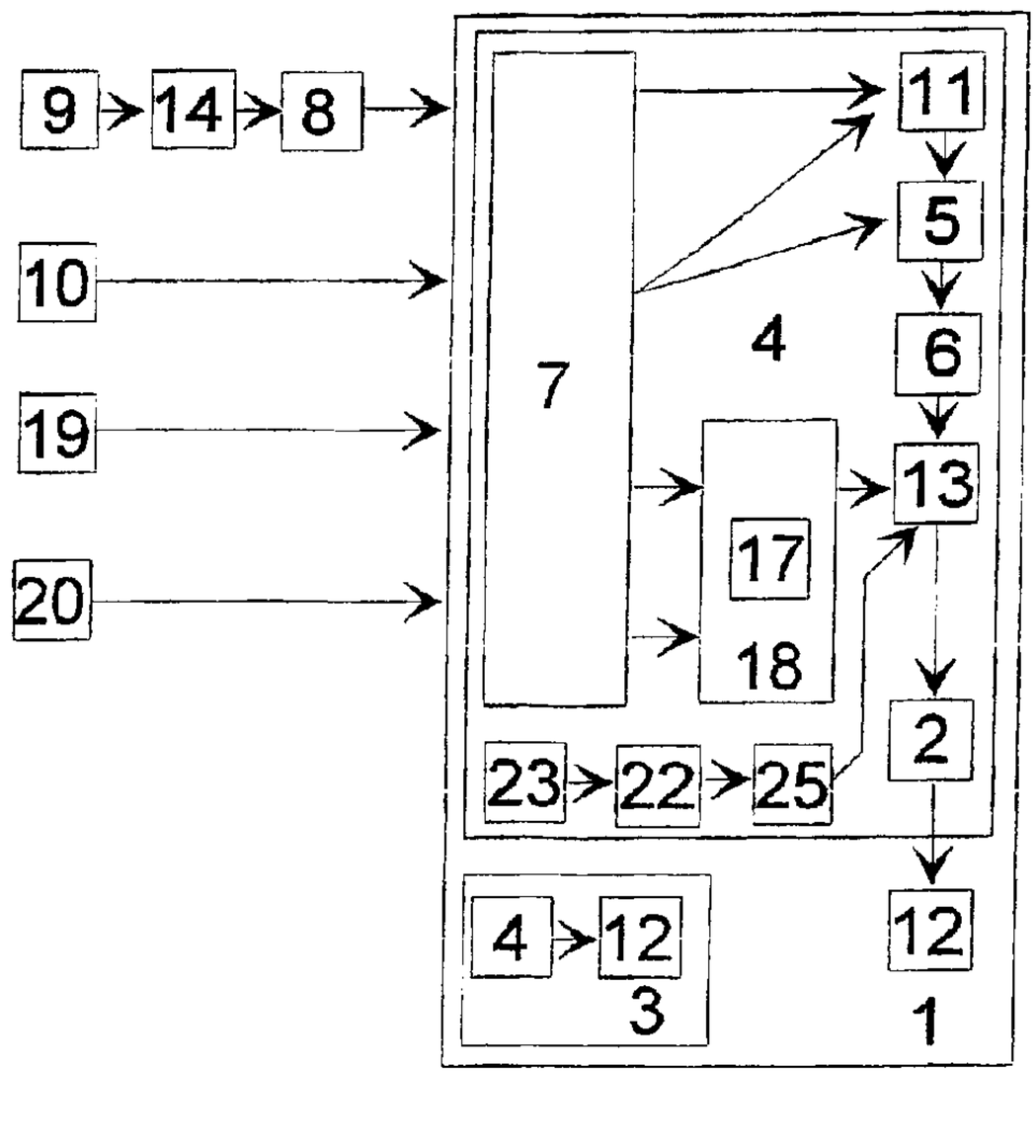
(54) Titre : DISPOSITIF DE RECHARGE AUTONOME POUR TELEPHONE PORTABLE ET/OU BATTERIE ET/OU ETUI DE PROTECTION

(54) Title: SELF-CONTAINED RECHARGING DEVICE FOR PORTABLE TELEPHONE AND/OR BATTERY AND/OR PROTECTIVE CASE




(57) Abrégé/Abstract:
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**(57) Abstract**

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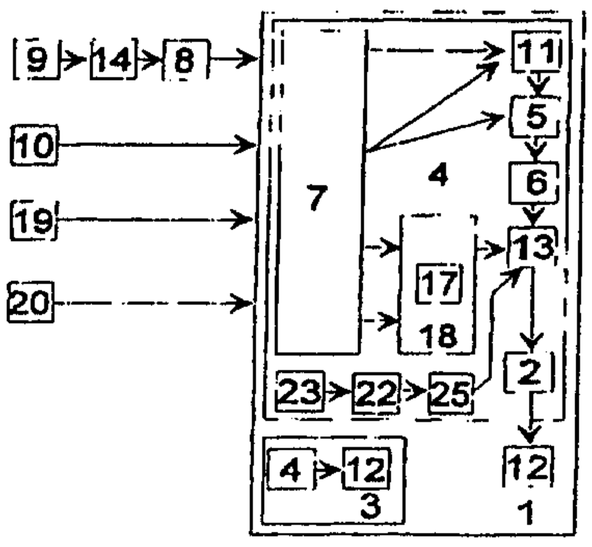



**(57) Abrégé**

La présente invention représente un dispositif de recharge (4), comprenant et constitué de capteurs photovoltaïques (5), particules de loupes alvéolées (11), amplificateur d'énergie lumineuse (6), électronique de gestion (7), masselotte magnétique (17), billes en acier (18), mécanisme à ressort (22) avec son remontoire manuel à papillon (23), alternateur (25) et batterie (2), constitué en un seul et même système extra plat, comprenant plusieurs formes de recharge et ceci dans n'importe quelles conditions et n'importe quelle position, insérées et fixées, en épousant la forme du téléphone (1) portable mobile (cellulaire), ou sur l'étui (21) de protection, ou sur une batterie (2) ou sur tout autre moyen de communication comprenant un émetteur–récepteur, afin de les rendre autonomes, de les faire fonctionner en délivrant de la tension et du courant électrique (13), afin de les recharger, d'entretenir, de maintenir et de les faire fonctionner, grâce à la lumière du jour (10), à l'éclairage artificiel (8), aux vibrations (20), aux mouvements (19) et au remontoire manuel à ressort.

# SELF-CONTAINED RECHARGING DEVICE FOR PORTABLE TELEPHONE AND/OR BATTERY AND/OR PROTECTIVE CASE

## FIELD OF THE INVENTION

This invention includes a device whose purpose is to recharge the batteries of a mobile (cellular) portable telephone through the use of a photovoltaic and vibratory device equipped with a management unit and an artificial and natural light energy amplifier and an inertia magnetic counter-weight ball which is sensitive to motion in order to create self-contained power.

## BACKGROUND OF THE INVENTION

At present, mobile (cellular) portable telephones are equipped with Nickel hybrid metal batteries or Lithium ion batteries or Cadmium Nickel batteries rechargeable only on the local (e.g. 220-volt) power network or through the cigarette lighter or other power outlet in vehicles, which, after recharging, provide a few dozen hours of self-contained power.

The device used currently presents several drawbacks:

First, when the mobile (cellular) portable telephone charge is used up, and the battery's charge is low, communication through the telephone's transmission-reception is cut. To recharge the battery, it is necessary to plug it into the local power network for several hours,

on the condition that an electrical outlet can be found nearby or that one has access to a vehicle's cigarette lighter or some other means.

Second, if the mobile (cellular) portable telephone user is at sea, in the countryside or in the mountains, or in a tent in a campground at night and does not have a source of electricity to recharge the telephone, he will not be able to use the mobile (cellular) portable telephone if the battery's charge is low. In fact, the transmitter-receiver of the portable telephone needs, during use, continuous direct current voltage delivered by its battery.

Third, the mobile (cellular) portable telephone, after being recharged on the local power network or by the cigarette lighter of a car for example, and when it is put on standby to receive communications, will consume electrical power and its battery power will be completely used up after a few dozen hours of operation.

To avoid all those drawbacks, and to facilitate and give more credibility to the use of mobile (cellular) portable telephones, GSM [Global System Mobile], UMTS [Universal Mobile Telephone System] or any other means of communication with a transmitter-receiver which enables a link with the telephone network, for users, the purpose of this invention is to supply a permanent and self-contained direct current voltage using light, vibration and also through the use of a manual

spring and electromechanical winder, adaptable to any circumstance whatsoever.

## SUMMARY OF THE INVENTION

The present invention seeks to provide a device which allows the continuous recharging of Nickel hybrid metal batteries, Lithium ion batteries or Cadmium Nickel batteries for powering or operating, among other things, a mobile cellular portable telephone or a communications transmitter-receiver, or a protective telephone case, or a telephone stand, using natural light outside and inside a building (daylight) and/or using the artificial lighting caused by all sorts of light generators such as light bulbs, flashlights, streetlights, neon lights, etc., through a device which consists of photovoltaic sensors whose face is equipped with a light energy amplifier and with an electronic management unit capable of analyzing, automatically guiding the connection of the photovoltaic sensors in series or in parallel to have either more electric voltage, or more electric current, and of distinguishing artificial lighting, caused by all sorts of light generators, from daylight (outside light).

If there is no daylight or artificial light (totally dark night), that means the recharging device will be unable to deliver voltage and an electric current. In spite of that handicap, the invention in this recharging device will make it possible to provide voltage and an electric current through vibrations or movements caused by any

electrical, physical, mechanical means, such as the swinging movement created by a person walking, a vehicle, train, boat, etc.; through the use of a device comprised of a magnetic counter-weight equipped with a steel ball which is sensitive to movements and vibrations or an extra flat spring mechanical winder attached inside the device. The movement caused by the swinging motion of the steel ball turns around the magnetic counter-weight which, through the electronic management unit, restores continuous electrical energy. In fact, a few minutes of continually moving the telephone, the battery, the case or any means of communication with a transmitter-receiver will recharge the batteries.

It is also possible, without causing vibrations and without moving and without causing vibrations of the device attached to a mobile (cellular) portable telephone, a transmitter-receiver, a case, a stand, and still in a totally dark night, to also produce voltage and an electric current using the mechanical spring winder, which can be wound, for example, by turning a butterfly winder, to tighten the spring. When the butterfly winder is manually released, it frees the spring and turns a small extra flat alternator which will recharge the battery by drawing voltage and an electric current. By this fact, these inventions have the characteristic of being in the same recharging device and allow the mobile (cellular) portable telephone to produce an electric current through light, artificial lighting and vibration and/or the use of a winding mechanism.

If the recharging device is inserted into a protective case, it can be equipped with a rapid connection without a connector due to magnetic induction, which will very easily allow the user to slip the telephone into the protective case and the battery of the case device will recharge and automatically supply the telephone with power through a magnetic induction connector. Thus, the voltage and electric current will pass by magnetization between the case and the mobile (cellular) portable telephone. The case will therefore have the characteristic of recharging itself and powering the mobile portable telephone just as well on the dashboard of a vehicle in the daytime, and the invention also allows the case to recharge itself and supply the telephone with power when the vehicle is travelling on a dark night due to the vibrations caused by operating the vehicle.

The recharging device, of which another desirable feature is its extra flat shape, can be attached in several ways, either on the battery in a single compact casing for operating among other things the mobile (cellular) portable telephone. This allows the battery to have its own recharging device responsive to light and vibrations, and at the same time to be mobile, portable, self-contained and removable.

The preferably extra flat recharging device can also be attached and connected to the back surface of the mobile (cellular) portable telephone where the battery compartment is located (cover or hatch); or on one or all clear surfaces of the mobile (cellular) portable

telephone, or attached to a protective case in order to supply, maintain, recharge and operate the mobile (cellular) portable telephone or any other means of communication with a transmitter-receiver.

But, if the user wants to protect, with a cover or a case, his mobile (cellular) portable telephone or other means of communication with a transmitter-receiver, by using a case, stand or protective cover, the extra flat recharging device can also be attached and inserted on such case, stand or protective cover. If so, the connection between the telephone and the case, to provide power and enable automatic operation, will be made by an automatic induction connector, such that the insertion of the telephone into a case, a stand or protective cover, will allow the mobile (cellular) portable telephone to operate immediately.

In accordance with a first aspect of the present invention, there is provided a portable telephone arrangement comprising a transmitter-receiver, a recharger for electric charging, maintaining and powering of a battery pack for the telephone arrangement, said recharger including an optical to electrical transducer and a mechanical motion to electric transducer.

## BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now described in the relation to the accompanying drawings in which:

Figure 1 is a front view of a mobile, cellular telephone in accordance with a preferred embodiment of the present invention;

Figure 2 is a back view of the telephone of Figure 1;

Figure 3 is a side view of the telephone of Figures 1 and 2;

Figure 4 is a block diagram of components included in the telephone of Figure 1-3;

Figure 5 is a block diagram of a battery recharger in combination with the telephone of Figures 1-4;

Figure 6 is a block diagram of the telephone of Figures 1-4 in combination with a protective case; and

Figure 7 is a block diagram of the protective case.

## DETAILED DESCRIPTION OF THE DRAWINGS

Referring to Figures 1 to 3, a telephone (1), seen respectively in front, back and side views, is provided with a plate 30, which covers substantially all the free parts of the surface of the telephone (1).

Referring to Figure 4, when the electronic management unit (7) of the recharging device (4) of the present invention identifies daylight (10) - background outside light - the device (4) transforms the daylight (10) into an electric current (13) through photovoltaic sensors (5) which are sensitive to photons, in order to continuously recharge and under the best conditions, the Nickel hybrid metal, or

Cadmium Nickel or Lithium ion batteries (2) of the mobile (cellular) portable telephone (1) or the protective case (21) (Figures 6 and 7).

The electronic management unit (7) of the recharging device (4) can also identify weak light caused by artificial lighting (8) inside a building or from a light coming from a light source such as a flashlight (9) and it will tell the light amplifier (6) to amplify the artificial lighting that it receives, using alveolar lens particles (11) and photovoltaic sensors (5), and transform it into an electric current (13) to recharge, with a better performance, the Nickel hybrid metal or Cadmium Nickel or Lithium ion batteries (2) of the mobile (cellular) portable telephone (1) or the protective case (21) so that it then becomes operational.

After the recharging of the battery (2) is completed, if the artificial lighting (8) or other light (9) is very weak (shadow), the recharging device (4) will be able to supply and maintain the battery charge (2), so that the electric current (13) consumption of the portable telephone (1), on standby and waiting, can be totally or partially reduced through paralleling the device's photovoltaic sensors (5) in order to obtain more electric current (13). The paralleling is done automatically by the electronic management unit (7). Each photovoltaic sensor (5) restores voltage and an electric current (13) as soon as natural light (10) or artificial lighting (8) is detected. The electronic management unit (7) can automatically, depending on the

battery (2) demand, increase the voltage by putting the recharging device (4) in series. At that precise moment, there will be little electric current (13); but the electronic management unit (7) will also be able to parallel the photovoltaic sensors (5) and at that precise moment, the electric current (13) will be higher with less voltage.

The invention thus allows for the recharging device (4), the mobile (cellular) portable telephone (1), and the protective case (21), to be much more self-contained than previously, by providing the telephone (1) with its own battery recharging device (4) with an automatic light energy control; whereby a low light or a bright light is detected first by the photovoltaic sensors (5), then managed by the electronic management unit (7) that determines whether it must amplify the light to restore it in the form of an electric current (13). The automatic light energy control can comprise photovoltaic sensors (5), photodiodes (15), photoresistors (16), or the like.

The light energy amplification is controlled by the electronic management unit (7), but can also be a mechanical amplification through alveolar lens particles (11) or in the form of micro-beads embedded and inserted into the photovoltaic sensors (5) to trap daylight or the artificial lighting in order to increase the light radiation, on the mobile (cellular) portable telephone (1) casing, the protective case (21), through the recharging device (4). However the recharging device (4) can also recharge, supply and maintain its own battery (2), the

mobile (cellular) portable telephone (1), the protective case (21), as soon as it detects vibrations (20) caused by the swinging movements of a person walking, a bicycle, a vehicle, a boat, etc. through the extra flat magnetic counter-weight (17) whose periphery is equipped with a steel ball (18) which, by turning, creates electrical energy by induction composed of voltage and an electric current (13) managed by the electronic management unit (7). The battery recharge can also be performed by spring mechanisms (22) that are wound manually using a butterfly winder (23), similar to that on a mechanical alarm clock, placed on the recharging device (4). In fact, once the spring mechanism (22) is wound, it will cause, by momentum, either the magnetic counter-weight (17) or an extra flat alternator (25) to automatically generate an electric current (13) aimed at enabling the operation, powering, maintaining or recharging of the batteries (2) of the mobile (cellular) portable telephone (1), the protective case (21) or its own battery.

The recharging device (4) can be attached to and inserted on the battery (2), the mobile (cellular) portable telephone (1), on a protective case (21) or on any stand and is capable of powering, maintaining and recharging, without a wire connection, the mobile (cellular) portable telephone (1), and the battery (2) through an induction connector (24) (Figure 6). Once the mobile (cellular) portable telephone (1) is inserted into the protective case (21), the power for the telephone (1) will be supplied automatically and by

induction (i.e. powering by "positive" magnetization and powering by "negative" magnetization) using an induction connector (24) on the protective case (21).

One or more recharging devices (4) can be attached to and inserted on the battery (2) or the mobile (cellular) portable telephone (1), on the protective case (21), on the stand or on any communication system with a transmitter-receiver.

If the electrical current consumption of the mobile (cellular) portable telephone (1) is significant when it is operating, and if the user wishes to use it, this recharging device (4) will recharge, power and enable it to operate in daylight (10) and/or artificial lighting (8) and by vibration (20), and also by the manual spring mechanism (22). On the other hand, if the electrical consumption of the mobile (cellular) portable telephone (1) is not high, the recharging devices (4) will recharge, power and enable it to operate either solely by light or solely by vibration.

Referring to Figure 5, a block diagram of a battery recharger in combination with the telephone is shown. The plate (30) connected and integrated with the removable battery (2) is equipped with a connector (12) or an inductive connector (24) (Figure 6) to power any means of communication using a mobile (cellular) portable telephone. As discussed above in relation to Figure 4, the compact recharging device

(4) comprises the elements to provide and maintain power to the telephone (1).

Referring to Figure 6, a block diagram of the telephone in combination with a protective case (21) is shown, in which the mobile (cellular) portable telephone (1), with or without a recharging device (4) and with or without a battery device (2), is inserted into the protective case (21), in the direction of the arrow so that the telephone (1) becomes operational.

Referring to Figure 7, a block diagram of the protective case is shown in which the protective case (21) or any other kind of stand or protective cover has been attached and inserted into the recharging device (4), the connector (12) or the inductive connector (24) which is capable of receiving and delivering direct current (13) to any type of mobile (cellular) portable telephone (1) or any communication system with a transmitter-receiver.

WE CLAIM:

1. A portable telephone arrangement comprising a transmitter-receiver, a recharger for electric charging, maintaining and powering of a battery pack for the telephone arrangement, said recharger including an optical to electrical transducer and a mechanical motion to electric transducer.

2. A portable telephone arrangement according to claim 1 in combination with a case for a portable telephone of the arrangement, the recharger being inserted and attached directly to the case, the telephone fitting into the case and having an exterior shape matching an interior shape of the case so that the recharger is capable of selective electric charging, maintaining and powering of the battery pack for the telephone in any position of the telephone and the case.

3. A portable telephone arrangement according to claim 1 or claim 2 wherein the mechanical motion to electric transducer includes a winding mechanism.

4. A portable telephone arrangement according to any one of claims 1 to 3 wherein the mechanical motion to electric transducer includes magnetic counter-weights having a periphery equipped with a steel ball for creating electric energy by induction.

5. A portable telephone arrangement according to any one of claims 1 to 4 further comprising an electronic management unit for selectively connecting the recharger in series in response to an indication of the battery pack energy requirements.

6. A portable telephone arrangement according to any one of claims 1 to 4 further comprising an electronic management unit for selectively connecting the recharger in parallel in response to an indication of the battery pack energy requirements.

7. A portable telephone arrangement according to any one of claims 1 to 6 wherein the optical to electric transducer includes electronic and mechanical optical amplifiers.

8. A portable telephone arrangement according to any one of claims 1 to 7 wherein the optical to electric transducer is constructed and arranged to be responsive to sunlight and artificial lighting and is located in a protective case for holding the telephone, the case being constructed and arranged to enable the telephone to operate and be powered automatically through an inductive connector.

9. A portable telephone arrangement according to any one of claims 1 to 8 wherein the optical to electric transducer is constructed and arranged to be responsive to sunlight and artificial lighting and is located in a protective case for holding the telephone, the case

being constructed and arranged to enable the telephone to operate and be powered automatically through a magnetic current connector.

10. A portable telephone arrangement according to any one of claims 1 to 9 wherein the optical to electric transducer is constructed and arranged to be responsive to sunlight and artificial lighting and is located in a protective case for holding the telephone, the case being constructed and arranged to enable the telephone to operate and be powered automatically through magnetization and being capable of making electric and power connections between the telephone and a protective case in any position of the telephone.

Figure 1

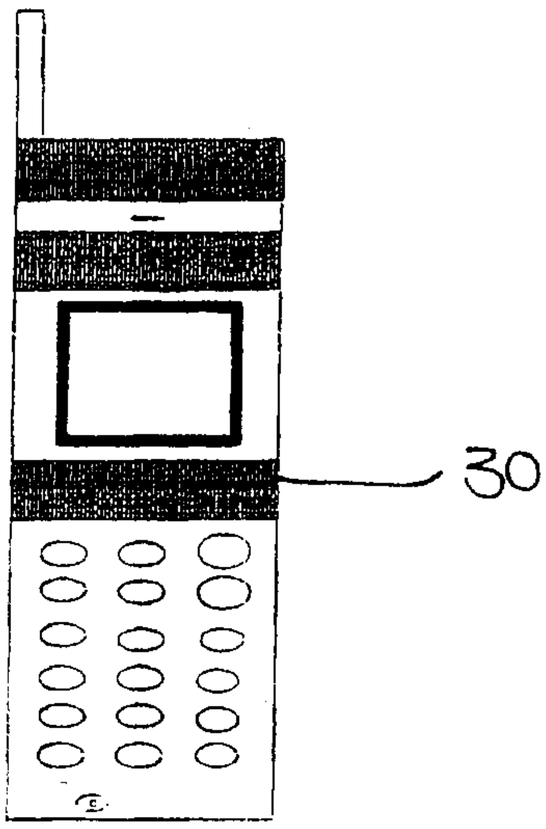



Figure 2

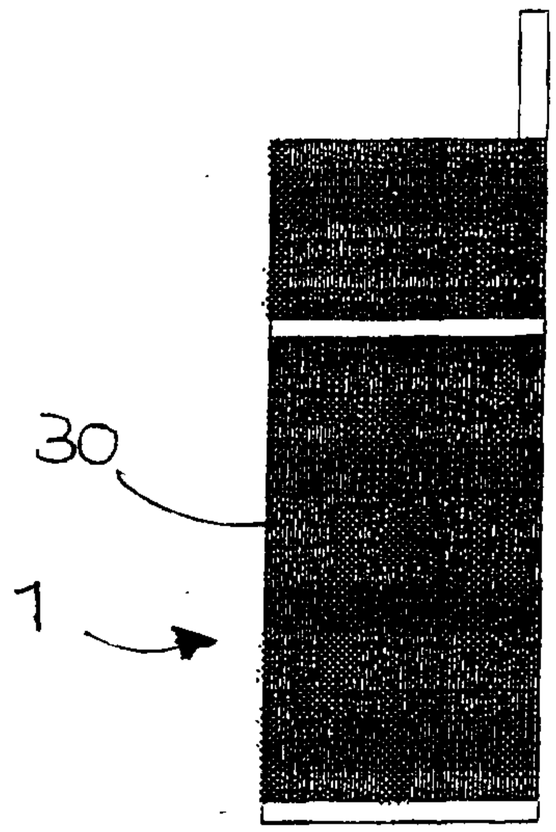



Figure 3

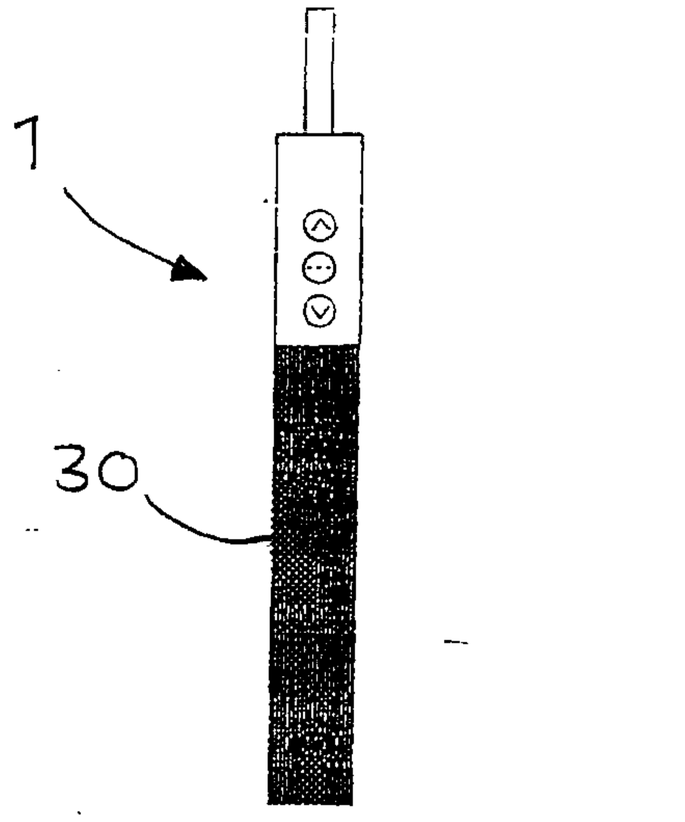



Figure 4

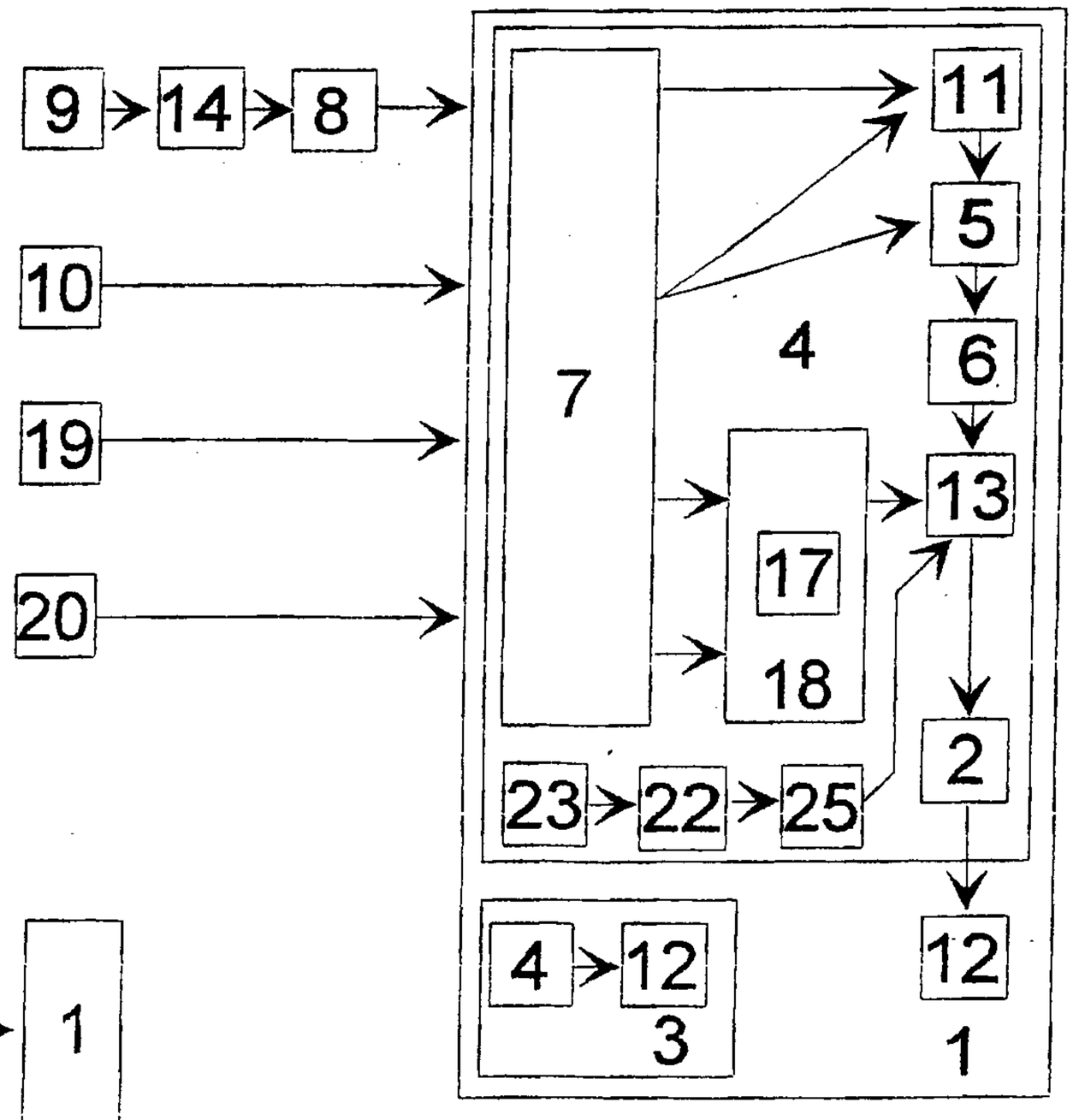



Figure 5

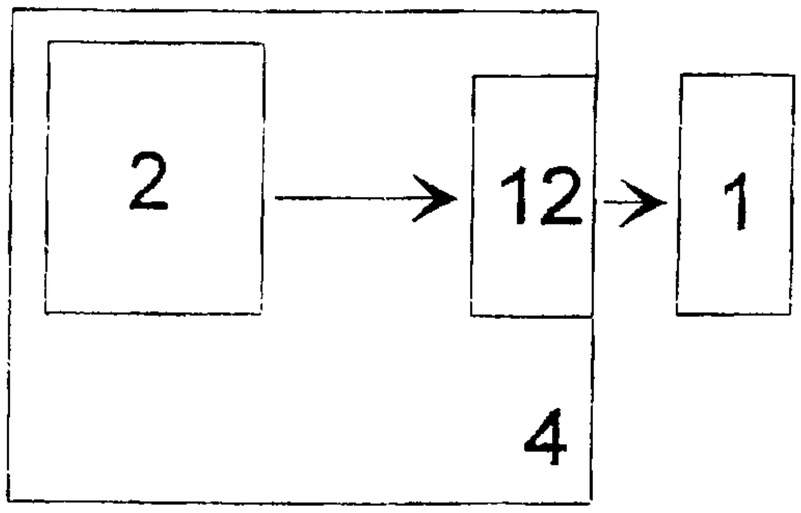


Figure 6

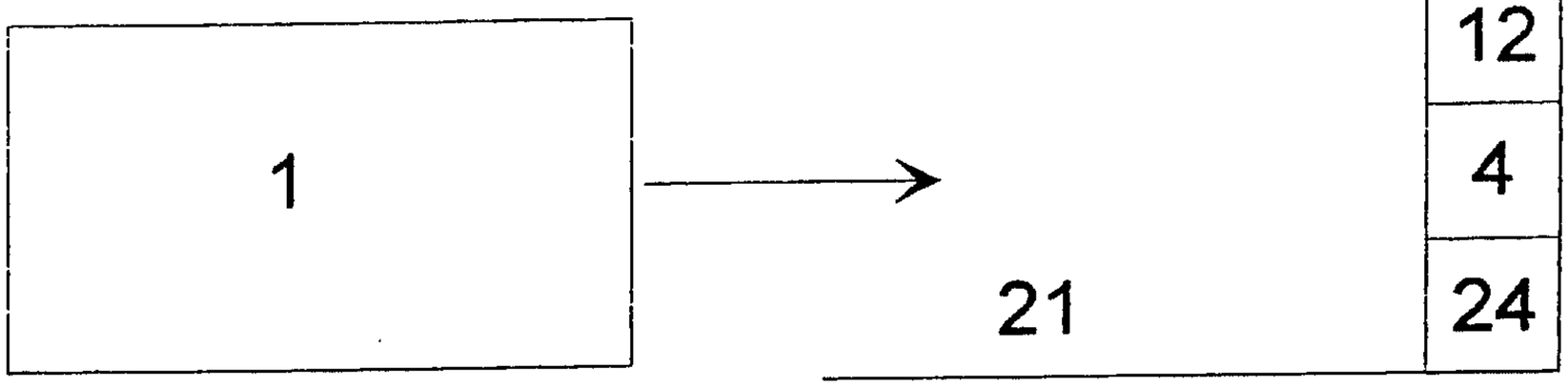
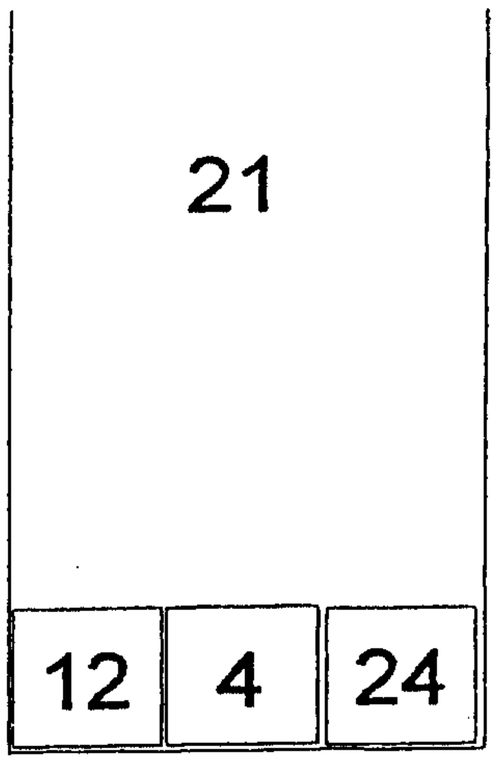
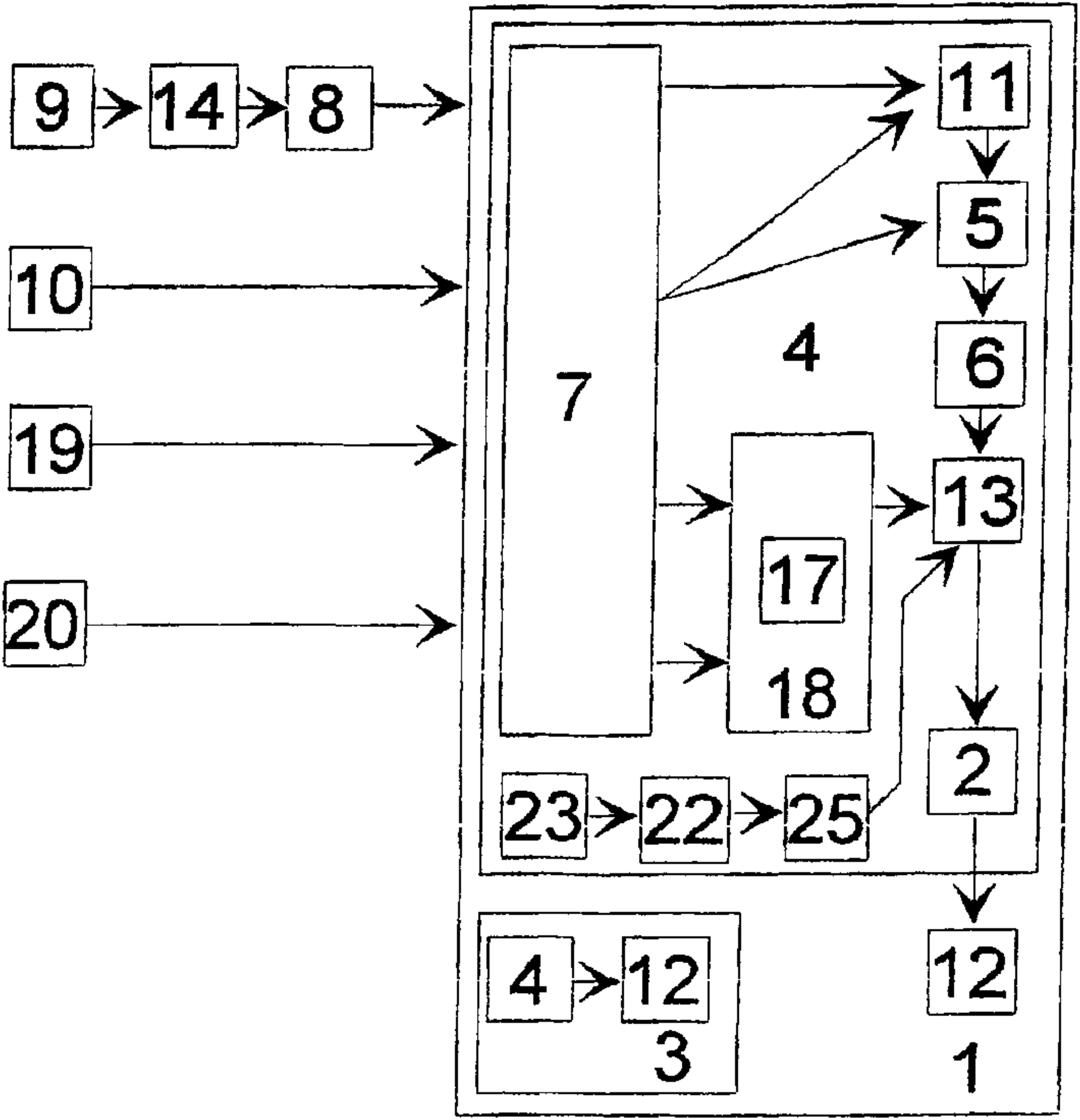



Figure 7

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