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Declarations under Rule 4.17:
—   *of inventorship (Rule 4.17(iv))*

(54) Title: PORTABLE DEVICE FOR ELECTRONIC PAYMENTS

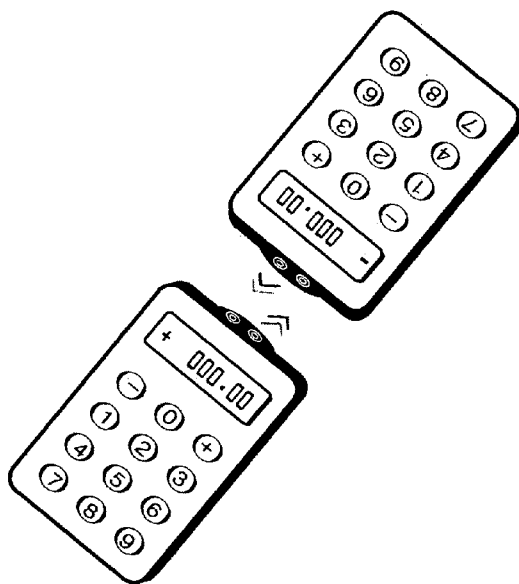Fig.ª 1/1

(57) Abstract: The present invention called "Portable device for
electronic payments" or "Electronic wallet calculator for cashless
transactions" refers to a combined system of conversion, calcula-
tion and transmission of processed data for immediate and pres-
encial payments and revenues, through portable or fixed devices
of close but contactless communication, which, in most models,
is similar to a wallet calculator or a mobile phone, in which the
basic functions of arithmetic operations designed to be subtrac-
tion (debit) or addition (credit) are only performed, whenever
two similar or compatible devices establish a link of connectivity
and synchronization of the processed, encoded and encrypted
data between themselves, in a secure and off-line way, using in-
frared, radio frequency of short distance, or other forms of "con-
tactless" transmission.

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DESCRIPTION

"PORTABLE DEVICE FOR ELECTRONIC PAYMENTS"

" Portable device for electronic payments " or " Electronic wallet calculator for cashless transactions " .

Combined system for synchronization, conversion, calculating and transmitting of processed data to simultaneous transactions from debit and credit values to be employed in portable or fixed devices and mobile phones.

BACKGROUND

All known systems of direct or remote payment which were developed, patented and implemented according to the current state of the art for electronic cashless transactions and other offline and online systems that represent digital cash are based on issuing systems of payment orders on current, stored, control and loyalty accounts. For this purpose, and through applications on portable or fixed mobile devices, they can transfer data, funds or credits, that were stored in the memory of the respective accounts or platforms to other accounts or systems.

This fact implies inevitable security risks, such as the interception and the use of the transferred data by a third party, the dual use of the electronically presented figures/ values (double spending) and the spread of the electronic trail left on all transactions.

To reduce or end the insecurity within electronic transactions and its consequences, there is only a solution that has no correspondence with any method, system or process of transfer of data, funds or stored credits, which will recognize the same advantages of real money, in terms of

security, anonymity, autonomy and independence, in the sys-
tems of payments and revenues without money " cashless " or
offline transactions.

A "cashless" payment system that achieves the transaction of
debit and credit values/figures, without implying any trans-
fer of data or funds, that are stored in the memory of the
respective accounts, will undoubtedly reduce the whole
necessary technical approach, in order to grant an efficient
solution to attain safe, reliable payments, in terms of
value, integrity, efficiency, economy and acceptance.

There is currently no other process, method or proposal for
"cashless" electronic transactions and payments, whose data
might be transmissible, but not transferable, and also inte-
grated in an off-line system, that should be:

-independent of banks, mobile operators or servers;

- autonomous 24 hours a day in real time and anywhere;

- 100% safe and free of costs, fees or commissions;

- anonymous and devoid of personal or confidential
information;

- accepted and recognized by everyone, including minors and
people, who don't use any bank or network;

-free and unbound to usage, loyalty or acceptance contracts;

- inviolable, unchangeable, not duplicable and immune to all
kinds of fraud;

-compatible with assisted or unassisted manual or mechanical
processing transactions, done in vending and automatic pay-
ment machines;

- it must allow payments in presence (face to face or person
to person) (P2P);

- which exempts the dialing of codes and the employment of
techniques of authentication, of privacy, authorization and
non-rejection;

-and which does not require the access to mobile communication networks, terminals or systems of banking processing.

INTRODUCTION

Assigned to the category of mobile interface systems for processing and conversion of encrypted, tradable and non-transferable data, the new integrated calculator for electronic payments and revenues, proposes a new, innovative, pioneering solution for applications in new processes of dematerialization payments or money transactions that use mobile or fixed devices which work either by remote connection or physical presence, including mobile phones or POS terminals, in order to replace cash (coins and paper money) with electronic or digital money, thus ensuring the same standards of value, safety , integrity, anonymity and convenience as those given by cash payments.

It is about an integrated solution for electronic transmission and connection, which is established between two communication devices, that are near but contactless, synchronized by a system of transmission, conversion, calculation and processing of tradable data, respecting presencial payments and revenues.

It can be also adapted to do transactions of remote, such as those accomplished through SMS or direct ATM, to reload and unload the account balance, by means of the available devices associated to a bank account.

All operations concerning presencial payment and revenue transactions are independent of the regulator's, financial's or mobile operator`s examination and authorization, being thus free of cost validation and authentication.

Operating in an autonomous system, in which values or credits
can be stored in the memory of that system, you can avoid
persistent access connections to mobile communication net-
works and to bank processing systems. This is the main
advantage for transactions of low value or of high frequen-
cy, for terminal payments or of automatic charge, for payment
of products and professional services, that do not accept any
other sort of electronic payment, for transactions between
individuals and between people without bank transactions and
for confidential or circumstantial transactions, that are
assumed in any place, time, situation or action and in loca-
tions without access.

All functions associated with the new process of monetary
validation intend to replace payments that use coins, paper
money, prepaid and debit cards by the new electronic trans-
action system, from a simple wallet calculator or mobile
phone, turned into an e-wallet that pays and receives pay-
ments, in a single device that combines connection, synchro-
nization and simultaneous bidirectional transmission of data
to be converted into debt and credit values, which are trad-
able between two connected parties (debtor and creditor).
Operating through a system of coded access and protected
by encryption, which allows us to recognize the authenticity
of the attached devices and the compatibility mode of the
encrypted data, you can perform the respective operation of
calculation (addition or subtraction), commanded by each one
of the two synchronized calculators.

The advantages of the new application for presencial trans-
actions between natural or legal persons, traders, companies
or institutions that use the new system of regulation,
accreditation, certification and electronic portability for

payments and revenues, includes - besides safety, comfort, simplicity, convenience, economy, autonomy and independence - the universal acceptance of a mobile system that manages all transactions around the "digital cash", which is available in a "cardless ", an anti-coins e-wallet that carries no personal data, thus ensuring absolute security of " cashless" transactions and anonymity, confidentiality and privacy in the performed transactions.

It also has the advantage of being able to control every cent spent and every performed movement, to consult the available or accumulated balance at any time and to make payments through ATM terminals or through vending machines and automatic charge.
Built on the concept of universal electronic money, it is the only free system that fulfils the role of digital cash entirely, as this digital cash is anonymous and autonomous, irreversible and convertible, of stable, unalterable, transmissible, non-transferable, non-duplicable, of unrestricted and not terminable value, ensuring thus all requirements of safety, confidence, integrity, reliability, authenticity and acceptance.

CONCLUSION
The present invention, called Portable device for electronic payments or " Electronic wallet calculator for cashless transactions ", refers to a combined system of conversion, calculation and transmission of processed data for presencial, cashless, offline and in loco payments and revenues, which is established between two portable or fixed communication devices, which are near but without contact, and

through which a connection signal is created, via infrared or radio frequency of short distance, which enables the synchronization of a simultaneous bidirectional transmission of encrypted, non-transferable data from an encrypted matrix that can be only recognized by the encoded device with the same key. In this way, the respective operation of calculation (addition or subtraction) can be done by each one of the two connected calculators, provided that the typed value of the transaction is equal in both and that the signal of the operation is reversed, thus validating any immediate transaction with output / debit values converted to digits on the display of the calculator that subtracts the payable amount in the memory of its balance, simultaneously showing the same credit converted into digits on the display of the other calculator, that sums the amount it receives in the memory of its account's balance.

The operation mode of the present invention refers essentially to the adaptation and integration of the basic functions of an arithmetic calculator into a communication device, which establishes a contactless proximity, so that a connectivity link between two identical or compatible devices may be established. This happens through the synchronization via infrared, radio frequency of short range, which allows you to perform and validate the respective operation of calculation. That operation will be organized and assumed by each one of the two involved parties in the transaction (debtor and creditor), without any interference of a third party (financial agents or network operators) and does not involve any data transfer, funds or credits stored in the memory of the respective calculators.

It follows that the new tool enables you not only to pay but also to receive payments by simply adding or subtracting the value of the transaction in the respective memory of the calculator. This is only possible when two equal or compatible devices respectively assume the condition of one of the parties (debtor or creditor), establishing a contactless connection of proximity between each-other, that can be achieved via infrared or radio frequency of short distance, provided that both type in the same value and that both perform an inverse operation of calculation.

The connection between the (two) devices or systems is protected by a proper encryption, so that only compatible devices may assume the corresponding synchronization, making the arithmetic operation of the two calculators possible, whose count is subtracted or added to the respective memory. Thus, the payment transaction and revenue is established, and accepted by the two parties.

According to the invention, the portable system for cashless transactions comprises an electronic device, which is like a wallet calculator or a mobile phone in most models; it has got a keyboard until 16 keys, an eight-digit numeric display or a numeric display of one or two rows of 16 characters and an integrated system of programming, memory and arithmetic calculation for the operations of addition, subtraction and percentages, a sender and receiver module of infrared or radio frequency of short range, a communication module for "SMS", a system of encryption and personal authentication linked to a personal card "SIM", a converter of connectivity and compatibility, the system date/clock, a security module and an appropriate protocol to protect the adopted systems, and a battery power supply.

Besides the functions of simultaneous processing of
conversion and calculation, communication and compatibility,
the portable device for payments and revenues includes a
registration system to consult the transactions performed
in two separate memories, a sound signal to confirm each
transaction, a personal authentication system connected to a
communication module by SMS for transactions linked to a
bank account, and an associated warning and lock system in
case of error processing, anomaly, intrusion or attempted
violation of the system.

According to its claims, the present invention is an
alternative solution to the existing payment systems, by
combining the functions of payment and revenue from the same
device; by being autonomous and independent of mobile opera-
tors, regulators and financial institutions or systems; and
by allowing the debit and credit transaction without the
need of connection to terminals or mobile networks, ensuring
presencial transactions without costs, in real time and eve-
rywhere; by replacing payments in cash (coins and paper
money) of all mechanical or manual processes through its
adaptation to automatic charging and vending machines, fixed
payment terminals, cash registers and ATMs; by admitting the
transaction of debit or credit values, through mobile net-
work SMS or through wireline ATM, to the associated bank
account; and by excluding from its system all personal data
that require the transfer or transmission of such data, jeo-
pardizing the anonymity, the confidentiality and the privacy
of transactions.
The integrated circuit systems, establishing the connection
between the components or modules that form the new "cash-
less" payment device, admit multiple forms and possibilities

of implementation and programming, which do not restrict or
alter the scope and objective of the present invention, thus
eliminating the presentation of any drawings or diagrams,
that could be necessary to its understanding.

Merely as an example and without being restrictive, a way of
implementing and operating the invention will be described
below. To do that the following instructions are going to be
employed for a reference model, from now on named calcultor:

1 - As soon as the value of the transaction is stipulated,
each one of the parties (debtor and creditor) connects the
calculator on his/her device pressing the signal (0).

Then he/she types the value of the operation, so viewing in
the display the respective importance.

2 - The two devices must come near to each other,a span away
from each other, so that the transmission connection is
straight, and in that position the debtor presses the signal
(-) while the creditor presses the signal(+),until two zeros
appear in the respective displays and a beep is heard, con-
firming at the time of the transaction that the arithmetic
operations of each one of the two calculators were held;

otherwise they will be locked and the operations won't done,
since there was one of the 5 possible errors:

a) The typed values for the transaction in the two calcula-
tors are not equal;

b) The typed signals of addition or subtraction in the two
calculators are equal;

c) The subtracting value in one of the calculators is higher
than the value of the respective memory;

d) A failure or malfunction of the system was detected;

e) One of the calculators is not compatible;

3- To consult the balance of the current account in the memory, you should neatly click on the keys with signal (0) and (+).

To consult the last transaction and all prior transactions click repeatedly on the key signal (-) after clicking on the keys signal (0) and (+) that start the consultation.

4- To clean or bring to zero the indicated value on the display neatly click on the keys signal (+) or (-) and (0).

5- To turn off the calculator and the device, click neatly on the signal keys (0) and (-).

6- To load or unload the calculator with a debit or a credit balance through ATM and from an associated bank account, enter the value and click the signal of the desired operation (+) or (-),and then type up the link key SMS, following the instructions you will receive from the registered mobile phone number, where the operation data and the request of reply to this situation are posted, so that the typed operation in the calculator may be immediately handled.

7- To load or unload the calculator with a debit or a credit balance through ATM and from an associated bank account, you must use the ATM card to access the respective bank account and to access the menu of operations " Rutbanking " so that, when approaching the portable display " Contactless " to the ATM panel, the entered transaction in the calculator may run.

8- To make payments on machines for automatic debits / charges, prepayment machines, vending machines, terminals or payment controllers, follow the instructions, so that, by approaching the portable device of the contactless display of those machines, the entered operation in the calculator may run.

30 January 2013

CLAIMS

1 - "Portable device for electronic payments" or "Electronic wallet calculator for cashless transactions", consisting of a wallet calculator or mobile phone, a communication system of integrated proximity without contact, in which the calculation operations and arithmetic programming are performed, when a reciprocal connection between two compliant devices is established, and which comprises a component of hardware that includes: a transmitter /receiver for infrared or radio frequency of short distance, a microcontroller of conversion and synchronization data, a microprocessor for programming and arithmetic calculation, an additional memory, a calculator screen with control keys for arithmetic functions of addition and subtraction, including the numerals 0 to 9 and the activation functions of memory, a display or screen for display presentation of the recorded amounts in the calculator's memory and of the added or subtracted values from this memory, a firmware component, a SIM card authentication, an optional module for communication via SMS, an optional date/ clock module and an electric battery or power supply.

2- " Portable device for electronic payment ", according to claim 1, characterized in that the means for the user interface (Keypad and display panel) that control the connection between the unit of processing and all components of the device are configured on a scheduled,consolidated and synchronized basis, for the simultaneous execution of the conversion, transmission, connection, calculation and memory functions.

3 - " Portable device for electronic payments," according to claims 1 and 2, characterized in that it integrates a transmitter and a receiver system of infrared or radio frequency of short distance, that establishes, between two compatible devices, a simultaneous two-way transmission of the data of an arithmetic calculation, that were typed in the respective calculators,and also establishes the exchange of the encoded or encrypted data of hardware authentication.

4 - " Portable device for electronic payments," according to claims 1 and 3, characterized in that it integrates a system of conversion and synchronizing data, that recognizes the encoded or encrypted data of hardware authentication, when two compatible devices are connected and also recognize the synchronized data of arithmetic programming, when the values entered in the two calculators are equal, and the operations done by the two calculators are reversed, and the subtracted value in one of the calculators is equal to or less than the amount accumulated in the respective memory.

5 - " Portable device for electronic payments," according to claim 4 , characterized in that it integrates a system for processing and calculation, which performs arithmetic operations of addition and subtraction, when two compatible devices are connected and the operated data in the two calculators are synchronized in the same way.

6 - " Portable device for electronic payment", according to claims 1, 2 and 5, characterized in that it integrates a processing system and memory, which allows you to consult and check the remaining balance of your current account and the latest added or subtracted values of this account, whose

data are recorded in a memory, so that they can be displayed
on the display or preview pane.

7 - " Portable device for electronic payments, " according
to claim 6, characterized in that the added, subtracted, or
accumulated values in the memory of a calculator and shown
on the display or preview pane, represent the money, funds
or credits that are transacted in the memory of that calcu-
lator, in the form of non-transferable electronic data, and
that are generated, stored or deleted automatically in each
transaction.

8 - " Portable device for electronic payments," according to
claim 1, 2, 3 and 4, characterized in that it integrates a
system of processing and security,which irreversibly deletes
the encoded or encrypted data of the hardware authentica-
tion, when a device or system is subjected to an adverse,
unplanned or unauthorized action, definitely blocking and
canceling all forms of operation and validity of this device

9 - " Portable device for electronic payments," according to
claims 7 and 8, characterized in that the system comprises a
certifying authority, which is a financial or an issuing
entity of electronic currency that converts all transacted
amounts into the currency, certifying the validity of the
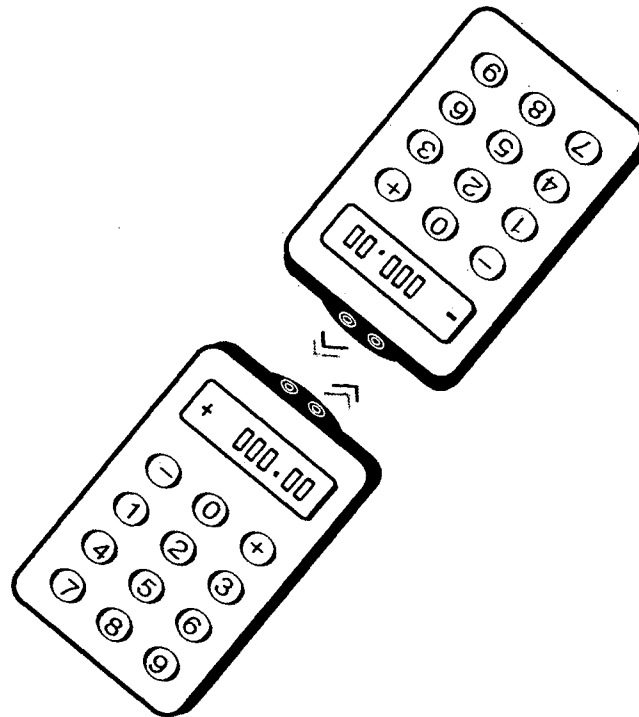devices with an expiration date.

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FIGURE

Fig.ª 1/1

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06Q20/06   G06Q20/22   G06Q20/32   G06Q20/38
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)

G06Q

Documentation searched other than minimum documentation to 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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 625 276 A (BENTON WILLIAM M [US] ET AL) 25 November 1986 (1986-11-25) the whole document -----	1-9

☐ Further documents are listed in the continuation of Box C.   ☒ See patent family annex.

* Special categories of cited documents :

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"E" earlier application or patent but published on or after the international filing date

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search	Date of mailing of the international search report
11 July 2013	18/07/2013

| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 | Authorized officer Breugelmans, Jan |

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4625276	A	25-11-1986	NONE	