



(51) International Patent Classification:
G06F 21/79 (2013.01)

(21) International Application Number:
PCT/EP2017/050202

(22) International Filing Date:
5 January 2017 (05.01.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
A 2016/00148 6 January 2016 (06.01.2016) TR

(71) Applicant: **ARCELIK ANONIM SIRKETI** [TR/TR]; E5
Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

(72) Inventors: **MARANGOZ, Sedat**; E5 Ankara Asfalti
Uzeri, Tuzla, 34950 Istanbul (TR). **GOYNUK, Burak**; E5
Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).
KUCUKOGLU, Emre Can; E5 Ankara Asfalti Uzeri,
Tuzla, 34950 Istanbul (TR). **MERT, Burak**; E5 Ankara
Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

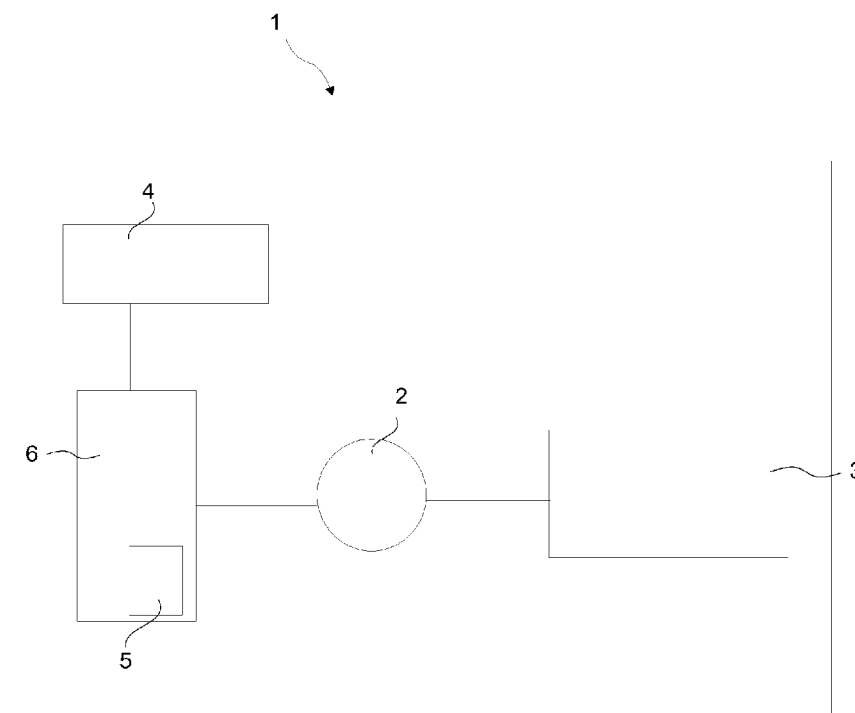
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA,
MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG,
NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS,
RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY,
TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN,
ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: AN ELECTRONIC DEVICE

Figure 1



[Continued on next page]



Published:

— *with international search report (Art. 21(3))*

(57) Abstract: The present invention relates to an electronic device (1) comprising a central processing unit (2), a memory unit (3) that operates in connection with the central processing unit (2) and that records the data obtained during the operations, and a main power unit (4) that provides the power for the operation of the central processing unit (2) and the memory unit (3).

Description**AN ELECTRONIC DEVICE**

- [0001] The present invention relates to an electronic device with increased safety.
- [0002] Electronic devices become more important day by day in terms of storing personal data. In particular online shopping, online banking transactions and e-government services require the sharing on the electronic environment of passwords and personal information used during the process. Particularly, safety is an important feature of cash register-POS devices. These types of devices encrypt the data therein, thus providing a safer utilization. Each device contains unique keys to encrypt and decrypt the data. Device-specific hidden keys are recorded on the RAM during the process and all the encryption operations are carried out via the RAM. Moreover, personal information shared online are stored on the RAM in the electronic devices. Nowadays, there are many methods of attack also known as cyber attacks. When third parties cut the power of the device when the safety keys or personal information on the RAM and have access to the RAM, the said passwords or keys can be retrieved. That the said personal information can be accessed by the third parties poses a critical security gap and disturbs the user.
- [0003] In the state of the art European Patent Application Document No. EP2456247, a method for the protection of the information on the RAM is disclosed.
- [0004] The aim of the present invention is the realization of an electronic device comprising a method increasing safety to prevent the third parties from accessing the information, the passwords or the keys recorded on the RAM.
- [0005] The electronic device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a central processing unit (CPU), a memory unit (RAM) that operates in connection with the central processing unit, that stores the operations carried out and the passwords or the information used during the operations, and a main power unit that provides the power required for the operation of the memory unit and the central processing unit.

- [0006] The electronic device of the present invention comprises a control unit that provides the operation of the memory unit and the central processing unit when the power supplied by the main power unit is interrupted. The control unit comprises an additional power unit that continues to supply the system when the power provided by the main power unit is interrupted. Thus, when the electronic device turns off, the central processing unit and the memory unit continue to operate for a while. As the RAM and the CPU continue to operate while the power is interrupted, the operations that keeps the information and the keys safe are enabled to be continued.
- [0007] In an embodiment of the present invention, the control unit checks the energy level in the system at certain intervals and sends commands to the central processing unit in accordance with the varying energy level. In cases such as blackouts or the unplugging of the electronic device, the control unit detects that the energy level is set to zero. Thus, the central processing unit and the memory unit are enabled to continue to operate with the commands received from the control unit.
- [0008] In an embodiment of the present invention, the control unit enables the information stored on the memory unit to be deleted when the power provided by the main power unit is interrupted. The control unit detects the interruption of the power provided by the main power unit and enables the central processing unit and the memory unit to continue to operate by means of the additional power unit. During the operation of the CPU and the RAM, the control unit sends the command to delete the information on the RAM. Thus, the system does not shut down without deleting the information or the keys on the RAM, thus providing a security measure against possible attacks.
- [0009] In an embodiment of the present invention, the control unit enables the CPU and the RAM to continue to operate and the data on the RAM to be deleted when the electronic device is hard reset. Thus, a security measure is provided for situations such as the hard reset of the electronic device by the user due to an error.
- [0010] In an embodiment of the present invention, the control unit enables the information on the RAM to be deleted while the electronic device is being

turned on or off. Thus, a security measure is taken by deleting the information on the RAM while the electronic device is restarted or turned off and turned on in a controlled manner.

[0011] In an embodiment of the present invention, the electronic device is a cash register-POS device.

[0012] The electronic device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

1. Electronic device
2. Central processing unit (CPU)
3. Memory unit (RAM)
4. Main power unit
5. Additional power unit
6. Control unit

[0013] The electronic device (1) comprises a central processing unit (2), a memory unit (3) that operates in connection with the central processing unit (2) and that records the data obtained during the operations, and a main power unit (4) that provides the power for the operation of the central processing unit (2) and the memory unit (3).

[0014] The electronic device (1) of the present invention comprises a control unit (6) having an additional power unit (5) that enables the central processing unit (2) and the memory unit (3) to be supplied with power when the power supplied by the main power unit (4) is interrupted. By means of the additional power unit (6), the central processing unit (2) and the memory unit (3) receive the commands sent by the control unit (6). Thus, the security of the information and the passwords on the memory unit (3) is provided. In situations such as blackouts, the unplugging of the electronic device, etc., the security of the information on the memory unit (3) can be provided by means of the commands sent by the control unit (6).

[0015] In an embodiment of the present invention, the control unit (6) checks the energy level and sends commands to the central processing unit (2) in accordance with the energy level. The control unit (6) checks the energy level at certain intervals. Instantaneous energy variations detected in the system cause the control unit (6) to delete the information on the memory

unit (3) for security reasons.

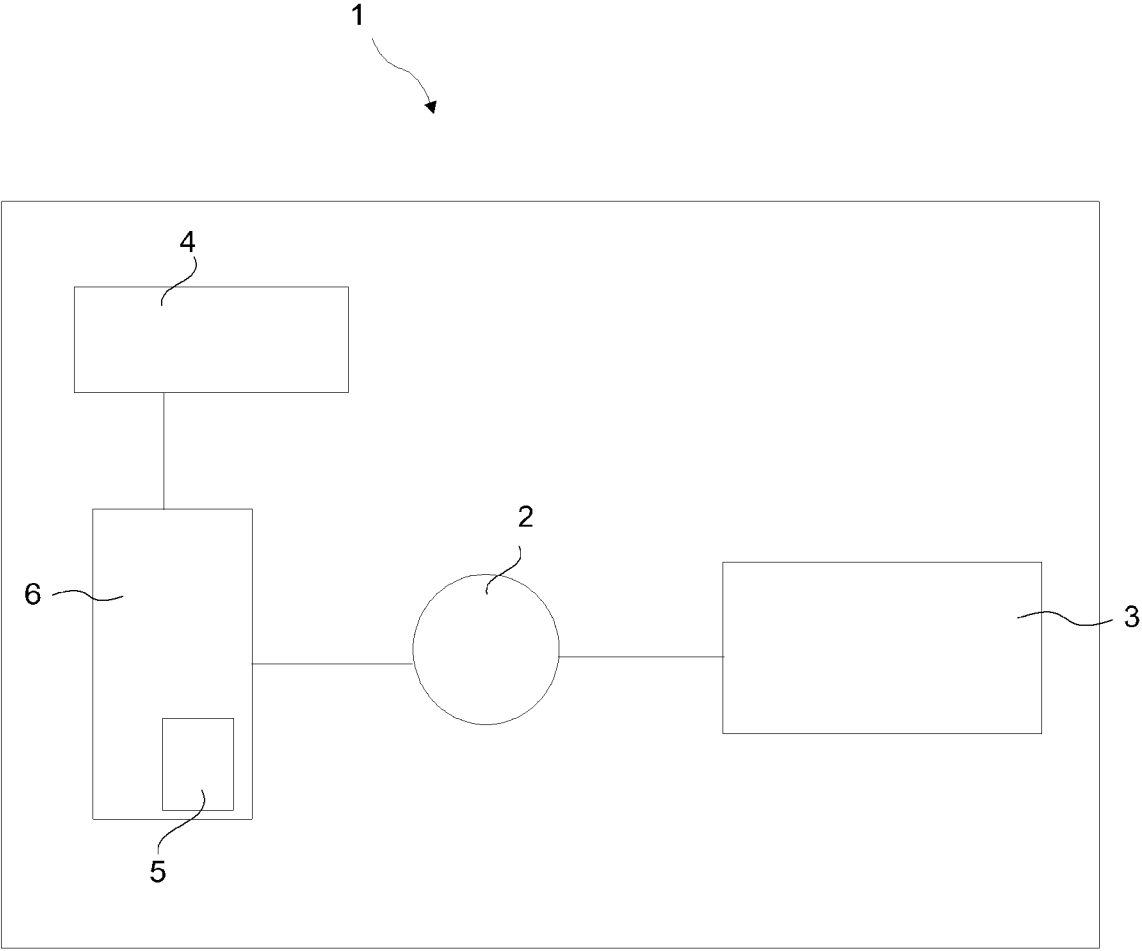
- [0016] In an embodiment of the present invention, the control unit (6) enables the information stored on the memory unit (3) to be deleted when the power provided by the main power unit (4) is interrupted. The energy supplied by the main power unit (4) to the memory unit (3) and the central processing unit (2) is interrupted, the additional power unit (5) disposed on the control enables the memory unit (3) and the central processing unit (2) to operate for a while longer. At the same time, the control unit (6) sends a command to delete the information and the passwords on the memory unit (3). Thus, even if the electronic device (1) stops operating, the third parties are prevented from accessing the information on the memory unit (3).
- [0017] In an embodiment of the present invention, the electronic device (1) comprises the control unit (6) that enables the central processing unit (CPU) (2) and the memory unit (RAM) (3) to continue to operate by means of the additional power unit (5) and that provides the deletion of the information on the memory unit (RAM) (3) when the electronic device (1) is hard reset. When the electronic device (1) is hard reset with the power button provided thereon except for the situations such as blackouts or the unplugging of the electronic device (1), the control unit (6) supplies power to the central processing unit (2) and the memory unit (3) so as to delete the information and the passwords on the memory unit (3).
- [0018] In an embodiment of the present invention, the electronic device (1) comprises the control unit (6) that enables the information stored on the memory unit (RAM) (3) to be deleted while the electronic device (1) is being turned on or off. When the electronic device (1) is restarted or turned off and on for any reason, the control unit (6) deletes the information and the passwords stored on the memory unit (3).
- [0019] In an embodiment of the present invention, the electronic device (1) is a cash register-POS device. Thus, the security of the information is provided in possible security attacks against payment systems.
- [0020] By means of the electronic device (1) of the present invention, the security of the information and the passwords on the memory unit (RAM) (3) is provided in instantaneous energy variations. Moreover, the attacks by the

third parties against the electronic device (1) are prevented.

Claims

1. An electronic device (1) **comprising** a central processing unit (2), a memory unit (3) that operates in connection with the central processing unit (2) and that records the operations carried out and the data obtained as a result of the operations, and a main power unit (4) that provides the power for the operation of the central processing unit (2) and the memory unit (3), **characterized by** a control unit (6) having an additional power unit (5) that enables the central processing unit (2) and the memory unit (3) to be supplied with power when the power supplied by the main power unit (4) is interrupted.
2. An electronic device (1) as in Claim 1, **characterized by** the control unit (6) that checks the energy level and that sends commands to the central processing unit (2) in accordance with the energy level.
3. An electronic device (1) as in Claim 1 or Claim 2, **characterized by** the control unit (6) that enables the information stored on the memory unit (3) to be deleted when the power provided by the main power unit (4) is interrupted.
4. An electronic device (1) as in any one of the above claims, **characterized by** the control unit (6) that enables the central processing unit (CPU) (2) and the memory unit (RAM) (3) to continue to operate by means of the additional power unit (5) and that provides the deletion of the information on the memory unit (RAM) (3) when the electronic device (1) is hard reset.
5. An electronic device (1) as in any one of the above claims, **characterized by** the control unit (6) that enables the information stored on the memory unit (RAM) (3) to be deleted while the electronic device (1) is being turned on or off.
6. An electronic device (1) as in any one of the above claims, which is a cash register-POS device.

Figure 1



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/050202

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F21/79
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)
G06F

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 2003/005323 A1 (HANLEY DAVID C [US] ET AL) 2 January 2003 (2003-01-02) paragraph [0002] - paragraph [0004] paragraph [0013] - paragraph [0022] -----	1-6
X	US 2013/326112 A1 (PARK YOUNG-JIN [KR] ET AL) 5 December 2013 (2013-12-05) paragraph [0071] - paragraph [0078] -----	1-6
X	US 2006/080494 A1 (KAWAGUCHI TADASHI [JP] ET AL) 13 April 2006 (2006-04-13) paragraph [0005] - paragraph [0008] paragraph [0121] - paragraph [0165] -----	1-6



Further documents are listed in the continuation of Box C.



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

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

23 March 2017

Date of mailing of the international search report

31/03/2017

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

Chabot, Pedro

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/050202

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2003005323	A1	02-01-2003	NONE	

US 2013326112	A1	05-12-2013	KR 20130134918 A	10-12-2013
			US 2013326112 A1	05-12-2013

US 2006080494	A1	13-04-2006	JP 4125277 B2	30-07-2008
			JP 2006093963 A	06-04-2006
			US 2006080494 A1	13-04-2006
