

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 January 2002 (03.01.2002)

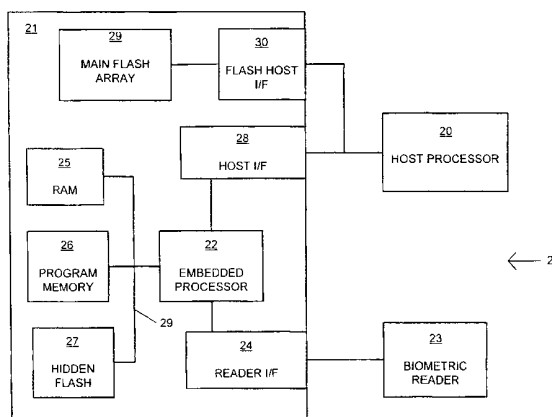
PCT

(10) International Publication Number
WO 02/01328 A3

- (51) International Patent Classification⁷: G07C 9/00, G06F 1/00
- (74) Agent: MALLIE, Michael, J.; Blakely Sokoloff Taylor & Zafman, LLP, 7th Floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).
- (21) International Application Number: PCT/US01/18692
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (22) International Filing Date: 7 June 2001 (07.06.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 09/604.682 27 June 2000 (27.06.2000) US
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (for all designated States except US): INTEL CORPORATION [US/US]; 2200 Mission College Boulevard, Santa Clara, CA 95052 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): HASBUN, Robert [US/US]; Mortara Circle, Placerville, CA 95667 (US). VOGT, James [US/US]; 4002 Tea Rose Court, El Dorado Hills, CA 95762 (US). BRIZEK, John [US/US]; 3050 Marci Lane, Placerville, CA 95667 (US).
- Published: — with international search report
- (88) Date of publication of the international search report: 6 June 2002

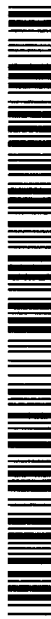
[Continued on next page]

(54) Title: BIOMETRIC-BASED AUTHENTICATION IN A NONVOLATILE MEMORY DEVICE



(57) Abstract: A biometric-based security circuit in which the user database, processor, and biometric map generation functions are all located on the same integrated circuit whose secure contents are inaccessible from external to the integrated circuit. Biometric data, such as a fingerprint, retina scan, or voiceprint, is taken from a user requesting access to restricted resources. The biometric data is transferred into integrated circuit, where it is converted to a biometric map and compared with a database of biometric maps stored in a non-volatile memory in the integrated circuit. The stored maps represents pre-authorized users, and a match triggers the security circuit to send a signal to a host processor authorizing the host processor to permit the requesting user access to the restricted resources. The integrated circuit essentially serves as a write-only memory for the secure data, because the secure data and security functions in the integrated circuit are not directly accessible through any pin or port, and therefore cannot be read or monitored through a dedicated security attack. A second non-volatile memory, accessible from external to the integrated circuit, can also be provided in the integrated circuit for holding non-secure data. This second memory has its own interface port, and is isolated from the security-related functions and memory so that secure and non-secure functions are physically isolated from each other and cannot be modified to overcome that isolation.

WO 02/01328 A3





For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PC1/US 01/18692

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G07C9/00 G06F1/00

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)
IPC 7 G07C 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 practical, 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.
P,X	WO 00 65770 A (ROWLEY THOMAS E III ;VERIDICOM INC (US)) 2 November 2000 (2000-11-02) page 11, line 18 -page 16, line 22 figures	1,5-8, 10, 12-14, 16,17, 19-21
X	US 6 070 796 A (SIRBU CORNEL) 6 June 2000 (2000-06-06) column 2, line 28 -column 3, line 37 column 7, line 60 -column 8, line 32 figure 7	1,5-8, 10, 12-14, 16,17, 19-21
	--- -/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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.
- *8* document member of the same patent family

Date of the actual completion of the international search

19 December 2001

Date of mailing of the international search report

02/01/2002

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Miltgen, E

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/18692

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 11750 A (SUBBIAH SUBRAMANIAN ;LI YANG (US); RAO D RAMESK K (US)) 19 March 1998 (1998-03-19) page 15, line 14 -page 17, line 24 figure 4 ---	1-22
A	US 5 155 680 A (WIEDEMER JOHN D) 13 October 1992 (1992-10-13) abstract; claims; figures ---	1,10,16, 20
A	US 5 448 045 A (CLARK PAUL C) 5 September 1995 (1995-09-05) ---	
A	WO 99 47989 A (VERIDICOM INC) 23 September 1999 (1999-09-23) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/18692

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0065770	A	02-11-2000	AU 4250100 A WO 0065770 A1	10-11-2000 02-11-2000
US 6070796	A	06-06-2000	FR 2738070 A1 FR 2740885 A1 AU 720839 B2 AU 6824096 A BG 102336 A BR 9610236 A CN 1194043 A CZ 9800408 A3 EP 0870222 A2 WO 9707448 A2 HU 9900499 A2 JP 11511278 T NO 980728 A PL 325164 A1 SK 22098 A3 TR 9800267 T2 ZA 9607077 A	28-02-1997 09-05-1997 15-06-2000 12-03-1997 30-12-1998 15-06-1999 23-09-1998 16-12-1998 14-10-1998 27-02-1997 28-06-1999 28-09-1999 20-04-1998 06-07-1998 07-10-1998 21-07-1998 21-05-1997
WO 9811750	A	19-03-1998	US 6219793 B1 AU 4341797 A EP 0931430 A2 WO 9811750 A2	17-04-2001 02-04-1998 28-07-1999 19-03-1998
US 5155680	A	13-10-1992	US 4796181 A CA 1281418 A1 EP 0265183 A2 JP 63191228 A US 5047928 A	03-01-1989 12-03-1991 27-04-1988 08-08-1988 10-09-1991
US 5448045	A	05-09-1995	AU 3777593 A WO 9317388 A1	13-09-1993 02-09-1993
WO 9947989	A	23-09-1999	AU 2996799 A WO 9947989 A1	11-10-1999 23-09-1999