

(12) **United States Patent**
England et al.

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- (54) **LOADING AND IDENTIFYING A DIGITAL RIGHTS MANAGEMENT OPERATING SYSTEM**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

5,812,980	9/1998	Asai .	
5,892,900	4/1999	Ginter .	
5,910,987	6/1999	Ginter et al. .	
5,915,019	6/1999	Ginter et al. .	
5,917,912	6/1999	Ginter et al. .	
5,920,861	7/1999	Hall et al. .	
5,933,498	8/1999	Schneck et al. .	
5,940,504	8/1999	Griswold .	
5,943,422	8/1999	Van Wie et al. .	
5,949,876	9/1999	Ginter et al. .	
5,953,502	* 9/1999	Helbig, Sr.	713/200
5,982,891	11/1999	Ginter et al. .	
5,991,876	11/1999	Johnson et al. .	
6,006,332	12/1999	Rabne et al. .	
6,009,274	* 12/1999	Fletcher et al.	713/1 X
6,009,401	12/1999	Horstmann .	

(List continued on next page.)

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Related U.S. Application Data

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- (51) **Int. Cl.⁷** **G06F 9/445**
- (52) **U.S. Cl.** **713/2; 713/200**
- (58) **Field of Search** **713/1, 2, 155, 713/164-167, 200; 717/11**

References Cited

U.S. PATENT DOCUMENTS

4,827,508	5/1989	Shear .
4,969,189	11/1990	Ohta et al. .
4,977,594	12/1990	Shear .
5,050,213	9/1991	Shear .
5,140,634	8/1992	Guillou et al. .
5,276,311	1/1994	Hennige .
5,410,598	4/1995	Shear .
5,473,690	12/1995	Grimonprez et al. .
5,473,692	12/1995	Davis .
5,544,246	8/1996	Mandelbaum et al. .
5,654,746	8/1997	McMullan, Jr. et al. .
5,721,781	2/1998	Deo et al. .
5,796,824	8/1998	Hasebe et al. .
5,812,662	9/1998	Hsu et al. .

OTHER PUBLICATIONS

Abadi et al., "Authentication and Delegations with Smart-cards", Jul. 30, 1992, 30 pages.

(List continued on next page.)

Primary Examiner—Thomas M. Heckler

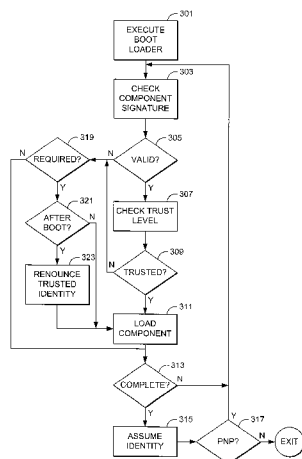
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(57)

ABSTRACT

The identity of an operating system running on a computer is determined from an identity associated with an initial component for the operating system, combined with identities of additional components that are loaded afterwards. Loading of a digital rights management operating system on a subscriber computer is guaranteed by validating digital signatures on each component to be loaded and by determining a trust level for each component. A trusted identity is assumed by the digital rights management operating system when only components with valid signatures and a pre-determined trust level are loaded. Otherwise, the operating system is associated with an untrusted identity. Both the trusted and untrusted identities are derived from the components that were loaded. Additionally, a record of the loading of each component is placed into a boot log that is protected from tampering through a chain of public-private key pairs.

31 Claims, 10 Drawing Sheets



U.S. PATENT DOCUMENTS

6,073,124	6/2000	Krishnan et al. .
6,112,181	8/2000	Shear et al. .
6,138,119	10/2000	Hall et al. .
6,148,402	11/2000	Campbell .
6,157,721	12/2000	Shear et al. .
6,185,683	2/2001	Ginter et al. .

OTHER PUBLICATIONS

Murphy et al., "Preventing Pirvacy: Authorization Software May Ease Hollywood's Fear of the Net", Internet World Magazine, Apr. 1, 2000, 3 pages.

"Internet Security: SanDisk Products and New Microsoft Technology Provide Copy Protected Music for Internet Music Player Market. (Product Announcement)", Edge: Work Group Computing Report, Apr. 19, 1999, 2 pages.

Arbaugh et al., "A Secure and Reliable Bootstrap Architecture", Distributed Systems Laboratory, Philadelphia, PA, 1997, pp. 65-71.

Lampson et al., "Authentication in Distributed Systems: Theory and Practice", Digital Equipment Corporation, ACM Transactions on Computer Systems, vol. 10, No. 4, Nov. 1992, PP 265-310.

Clark et al., "Bits: A Smartcard Protected Operation System", Communications of the ACM, vol. 37, No. 11, Nov. 1994, pp. 66-70, 94.

Yee, "Using Secure Coprocessors", School of Computer Science, Carnegie Mellon University, 1994, 104 pages.

* cited by examiner

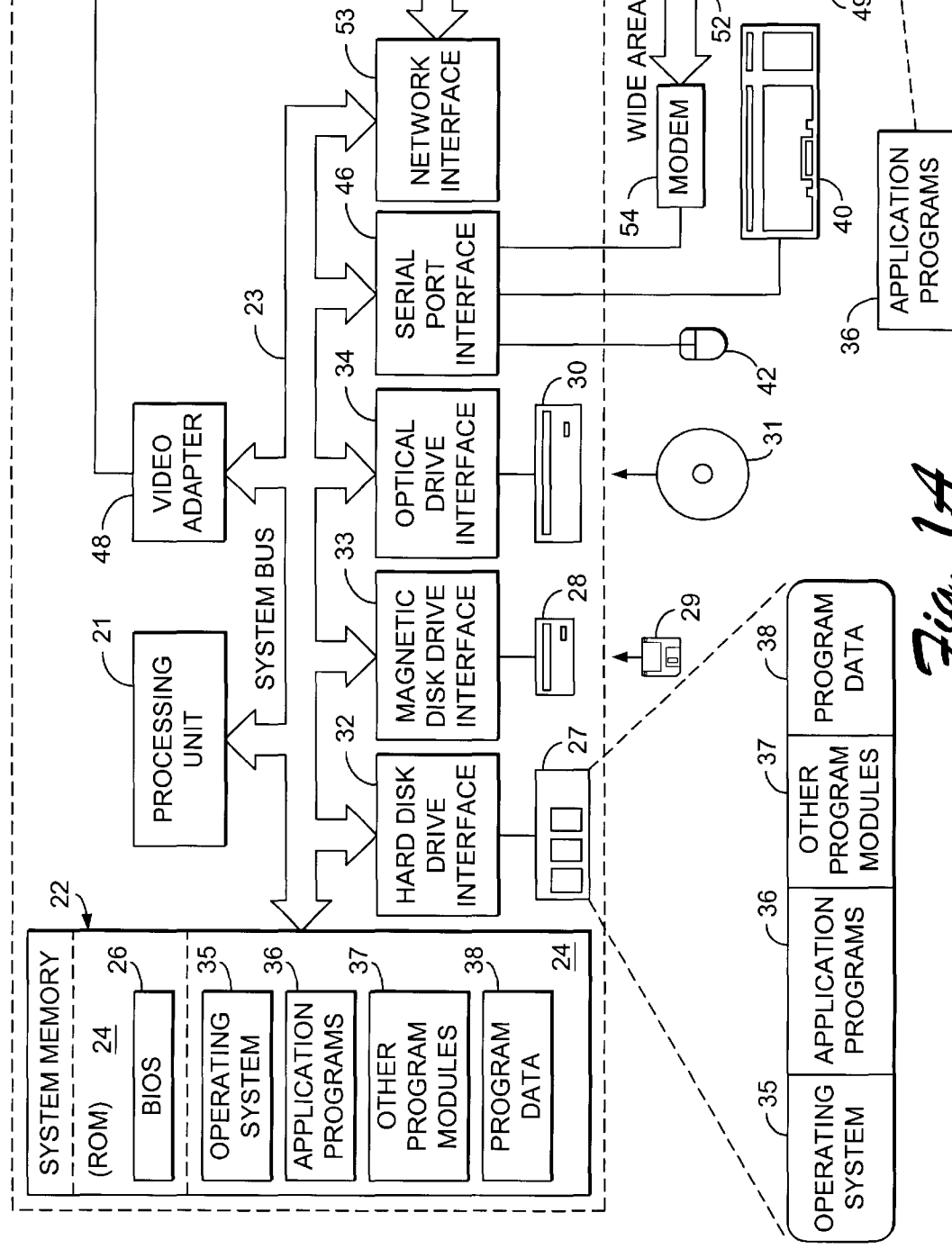


Fig. 1A

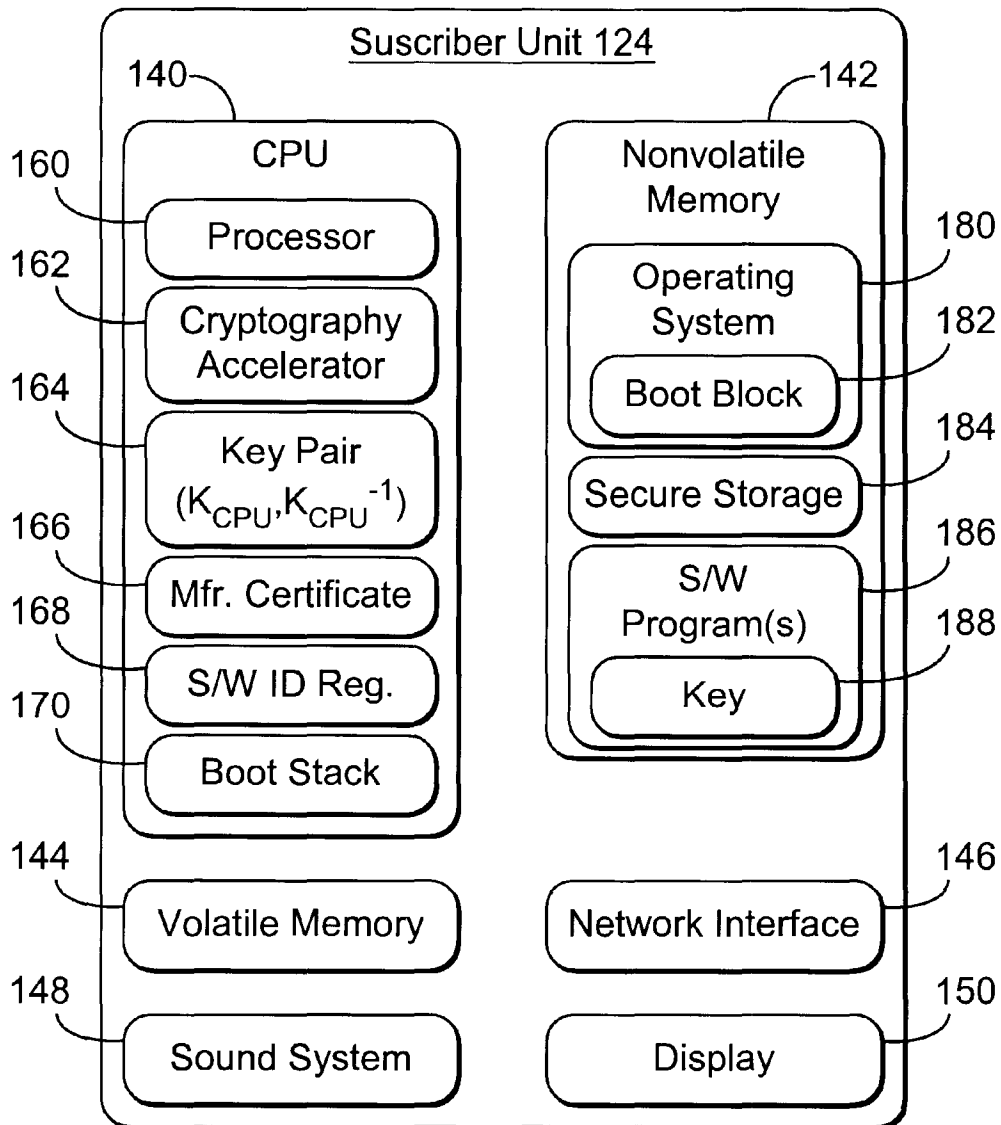


Fig. 1B

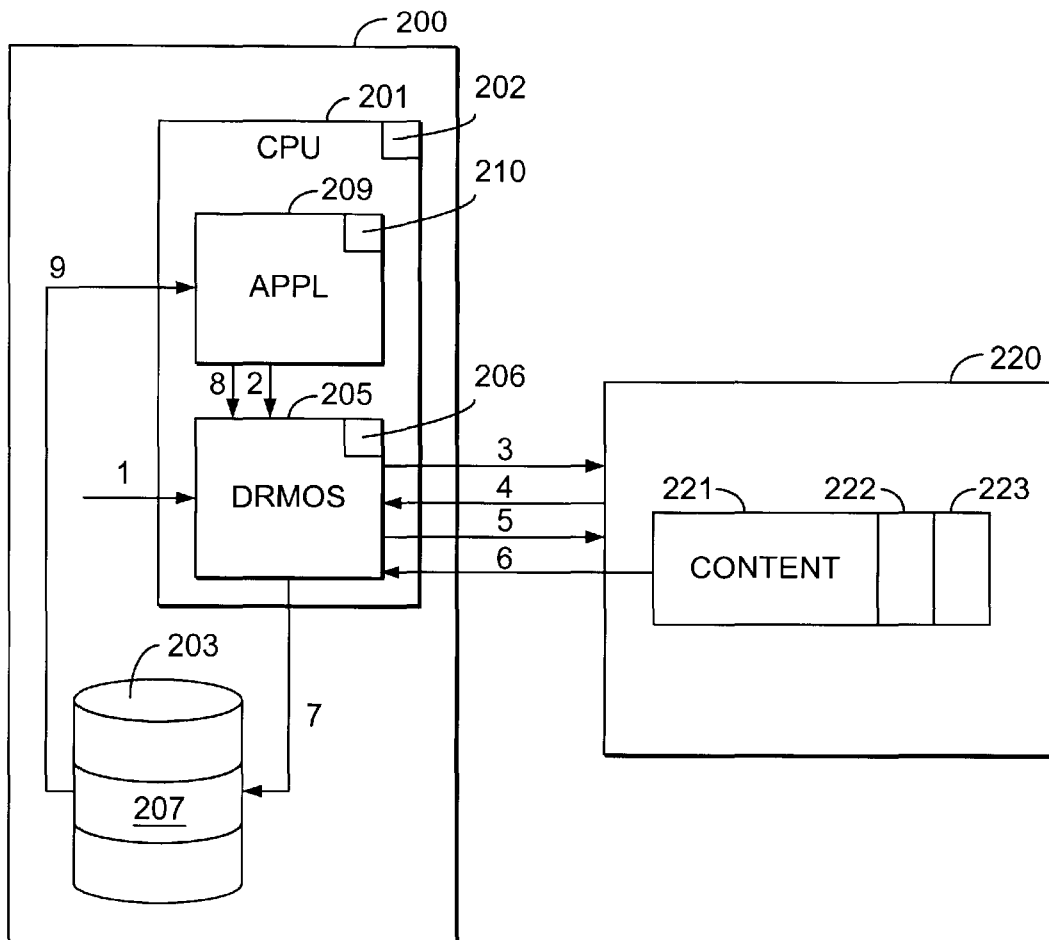


Fig. 2

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