

**United States Patent** [19]

[11] **Patent Number:** **5,673,316**

**Auerbach et al.**

[45] **Date of Patent:** **Sep. 30, 1997**

[54] **CREATION AND DISTRIBUTION OF CRYPTOGRAPHIC ENVELOPE** 5,553,143 9/1996 Ross et al. .... 380/25  
5,586,186 12/1996 Yuval et al. .... 380/4

[75] **Inventors:** Joshua Seth Auerbach, Ridgefield, Conn.; Chee-Seng Chow, Cupertino, Calif.; Marc Adam Kaplan, Katonah, N.Y.; Jeffrey Charles Crigler, McLean, Va.

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*Attorney, Agent, or Firm*—Douglas W. Cameron

[57] **ABSTRACT**

A method and apparatus to create, distribute, sell and control access to digital documents using secure cryptographic envelopes. An envelope is an aggregation of information parts, where each of the parts to be protected are encrypted with a corresponding part encryption key. These encrypted information parts along with the other information parts become part of the envelope. Each part encryption key is also encrypted with a public key, and these encrypted part encryption keys are also included in the envelope. The envelope also includes a list of parts where each entry in the list has a part name and a secure hash of the named part. The list is then signed with a secret key to generate a signature, which is also included in the envelope. The signature can be verified using a second public key associated with first secret key, and the integrity of any information part in the envelope can be checked by computing a second hash and comparing it with the corresponding hash in the list of parts. Also, the information content of any encrypted part can only be recovered by knowledge of a second secret key corresponding to the public key that was used to encrypt the part encryption keys.

[73] **Assignee:** International Business Machines Corporation, Armonk, N.Y.

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[22] **Filed:** Mar. 29, 1996

[51] **Int. Cl.<sup>6</sup>** ..... H04L 9/00

[52] **U.S. Cl.** ..... 380/4; 380/25

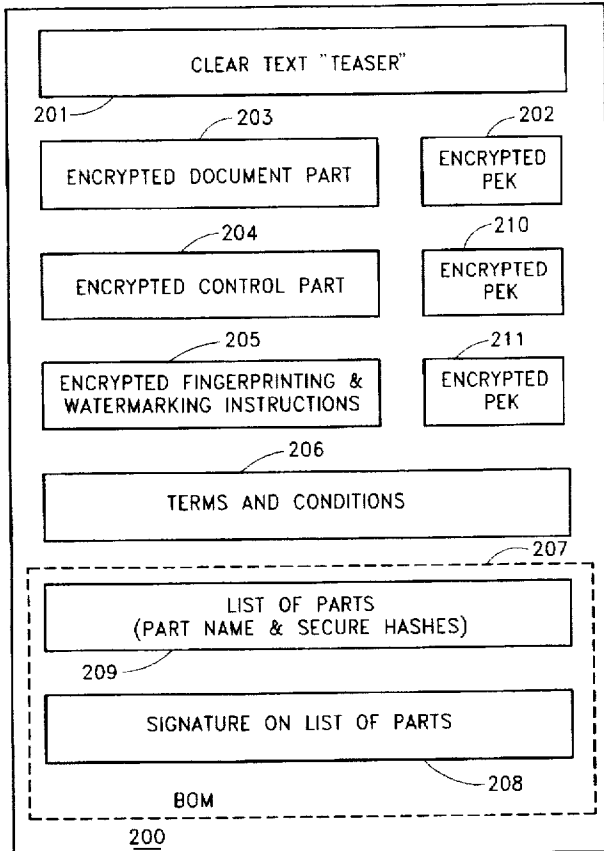
[58] **Field of Search** ..... 380/3, 4, 23, 24, 380/25, 28, 49

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**8 Claims, 6 Drawing Sheets**



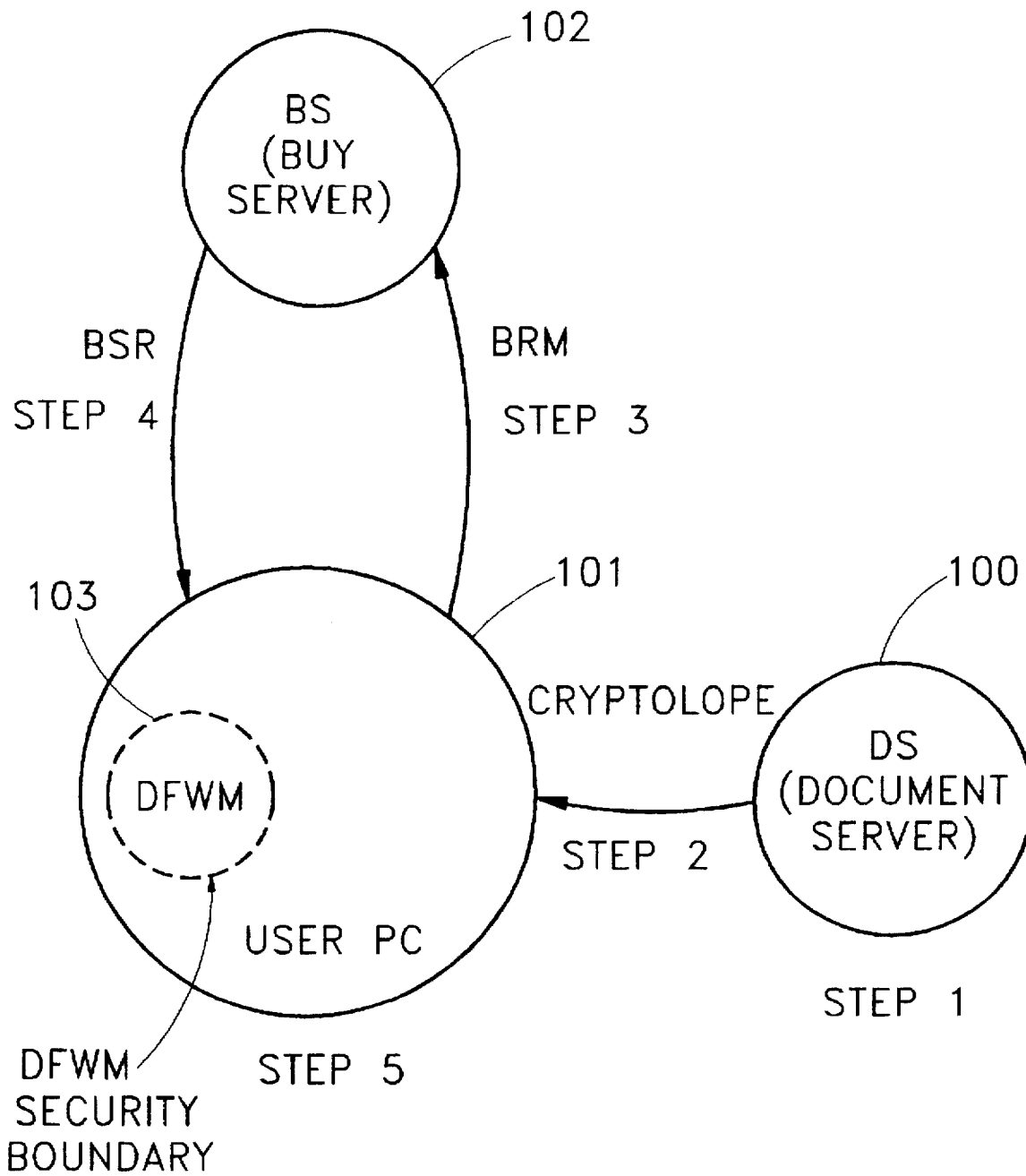


FIG. 1

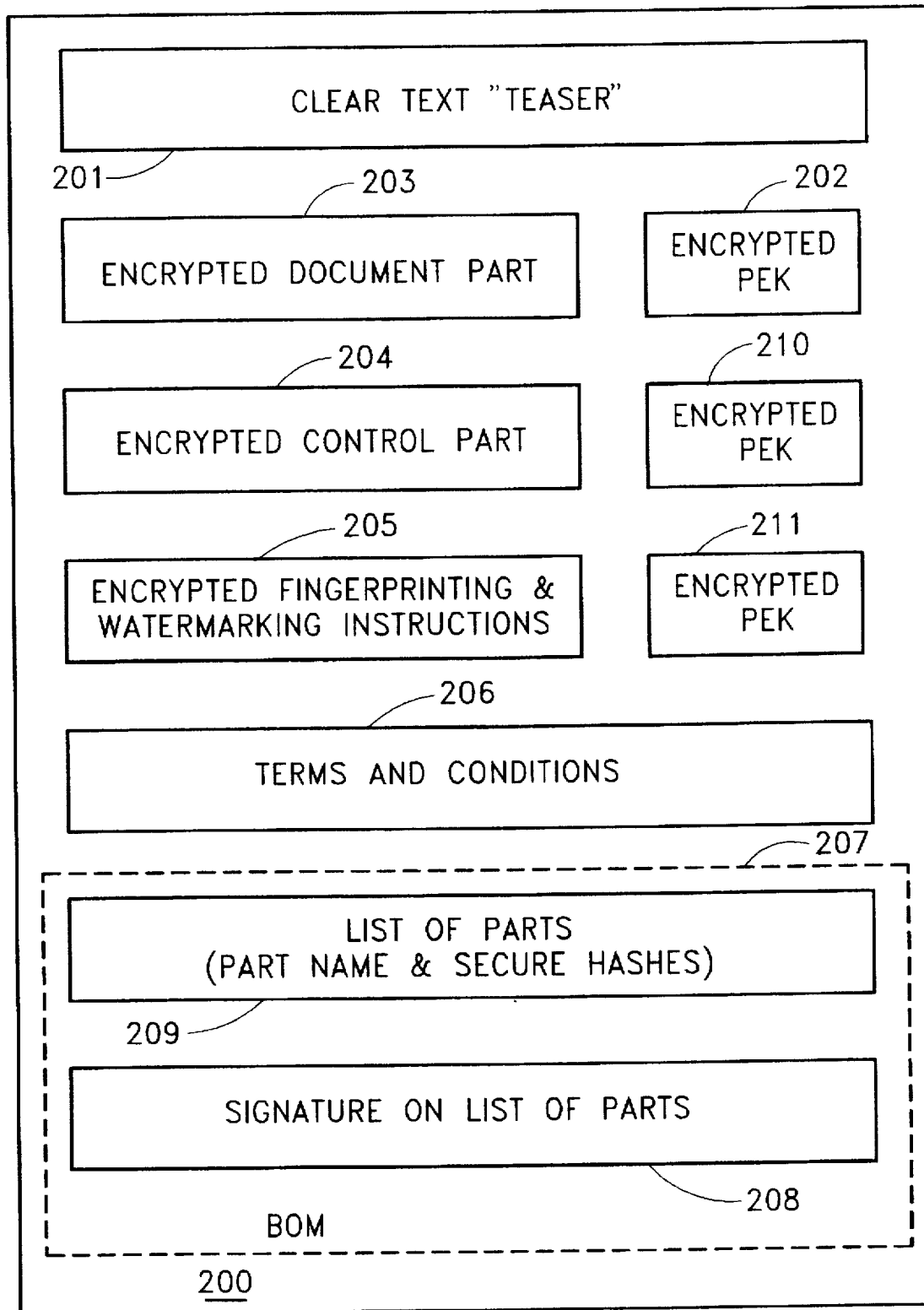


FIG.2

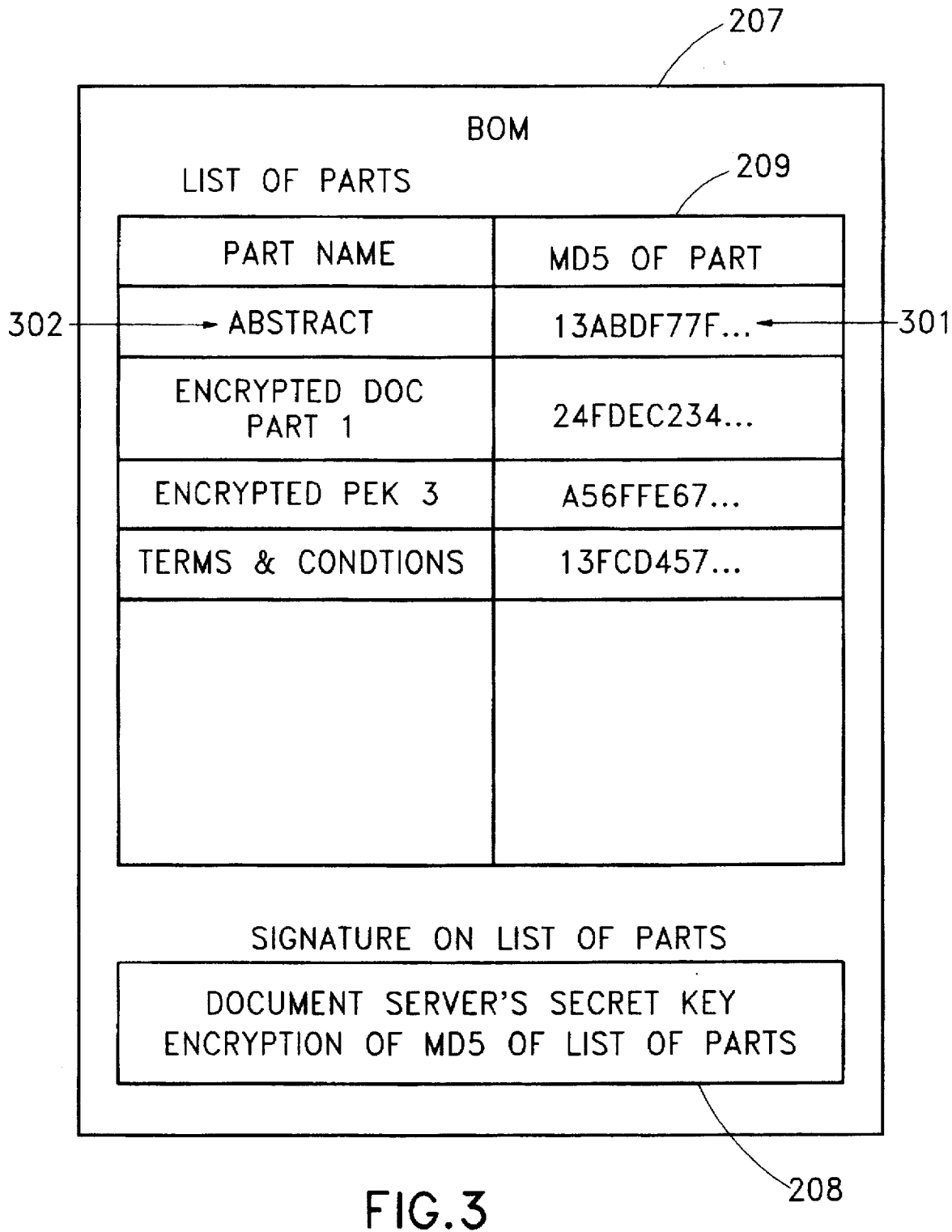


FIG. 3

DISCOUNT FACTOR QUANTITY	ORDINARY MEMBER	CORPORATE DISCOUNT	GOLD CLUB MEMBER	PLATINUM SUBSCRIBER
1 TO 10	1	0.8	0.8	0.75
11 TO 50	0.9	0.8	0.8	0.75
51 TO 100	0.85	0.75	0.7	0.75
100+	0.8	0.6	0.6	0.75

LIST PRICE=\$2.50

PRICE OF nTH COPY=LIST PRICE X MINIMUM APPLICABLE DISCOUNT FACTOR

TOTAL PRICE OF n COPIES=PRICE OF 1ST COPY+PRICE OF 2ND COPY+...+ PRICE OF nTH COPY

FIG. 4

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