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# United States Patent [19]

[11] Patent Number: **5,428,684**

**Akiyama et al.**

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[54] **ELECTRONIC CASHLESS TRANSACTION SYSTEM**

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[57] **ABSTRACT**

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A key control method is for use in an electronic cashless transaction system including at least a bank center, a store transaction terminal and an IC card being used as an electronic cashless transaction medium. The key control method comprises a step of having the bank center generate and code a first parameter for a transmission to the IC card; a step of having the IC card receive and decode the coded first parameter by using the first key, thereby reconstructing the first parameter issued by the bank center, perform a first operation on the first parameter and a password of a holder of the IC card, and store in a first register; a step of having the store transaction terminal send to the IC card a second parameter coded by a second key, when the holder inserts the IC card **11** into the store transaction terminal; a step of having the IC card decode the coded second parameter by using the second key, thereby reconstructing the second parameter received from the store transaction terminal, perform a second operation on the second parameter and the value stored in the first register, store a result of the second operation in the second register; and a step of decoding a value stored in the second register by using a coding session key stored in a memory of the IC card, thereby obtaining a key for an intended authentication.

[21] Appl. No.: **953,375**

[22] Filed: **Sep. 30, 1992**

[30] **Foreign Application Priority Data**

Sep. 30, 1991 [JP] Japan ..... 3-278831

[51] Int. Cl.<sup>6</sup> ..... **H04K 1/00**

[52] U.S. Cl. .... **380/25; 380/21;**  
380/23; 235/380

[58] **Field of Search** ..... 235/379, 380, 382;  
380/21, 23, 24, 25, 29, 49; 329/91, 97, 98

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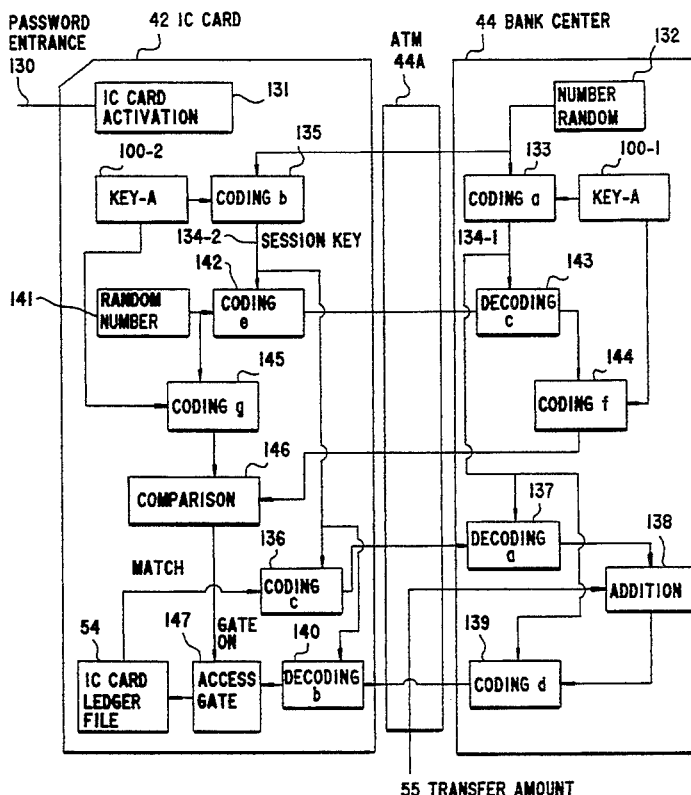
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*Primary Examiner—Tod R. Swann*

**14 Claims, 21 Drawing Sheets**



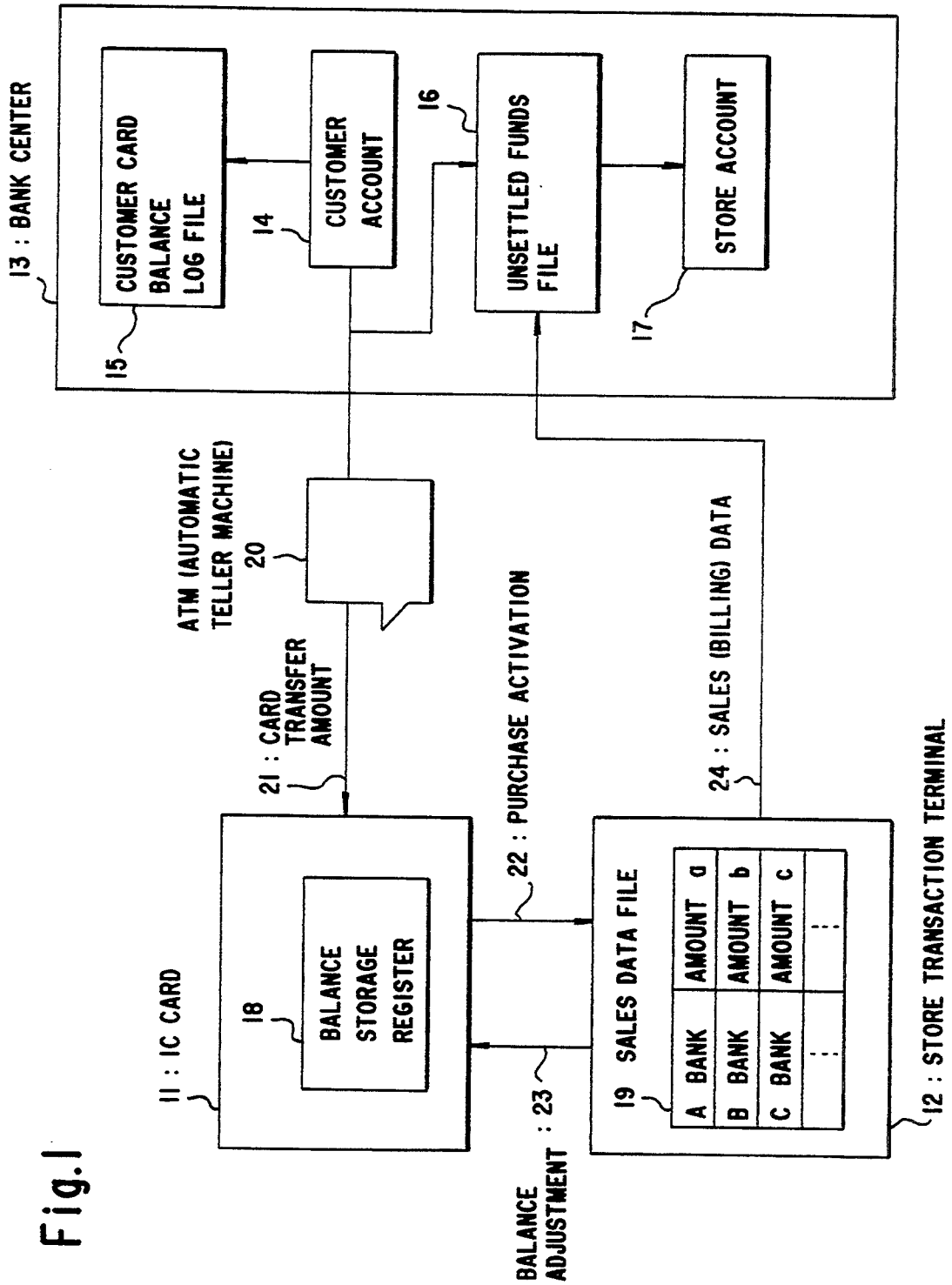


Fig. 1

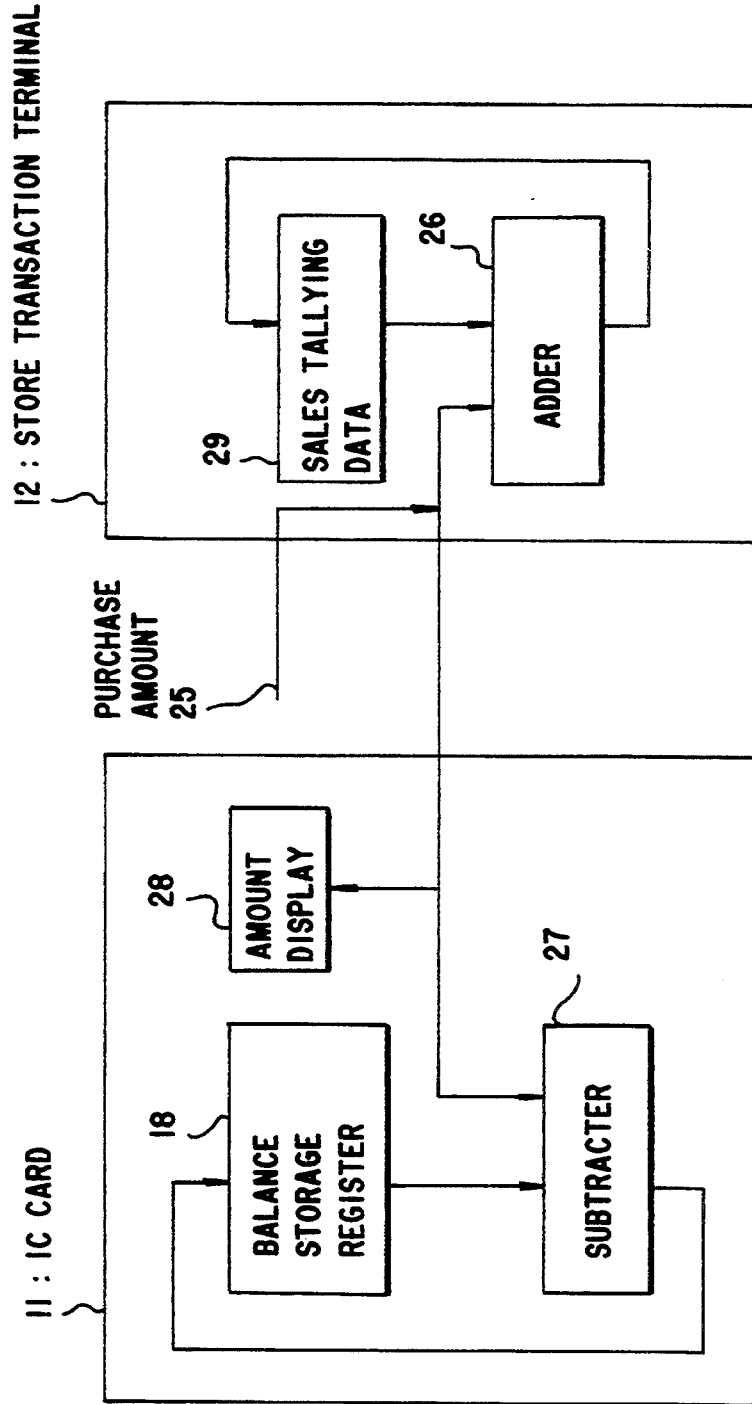


Fig.2

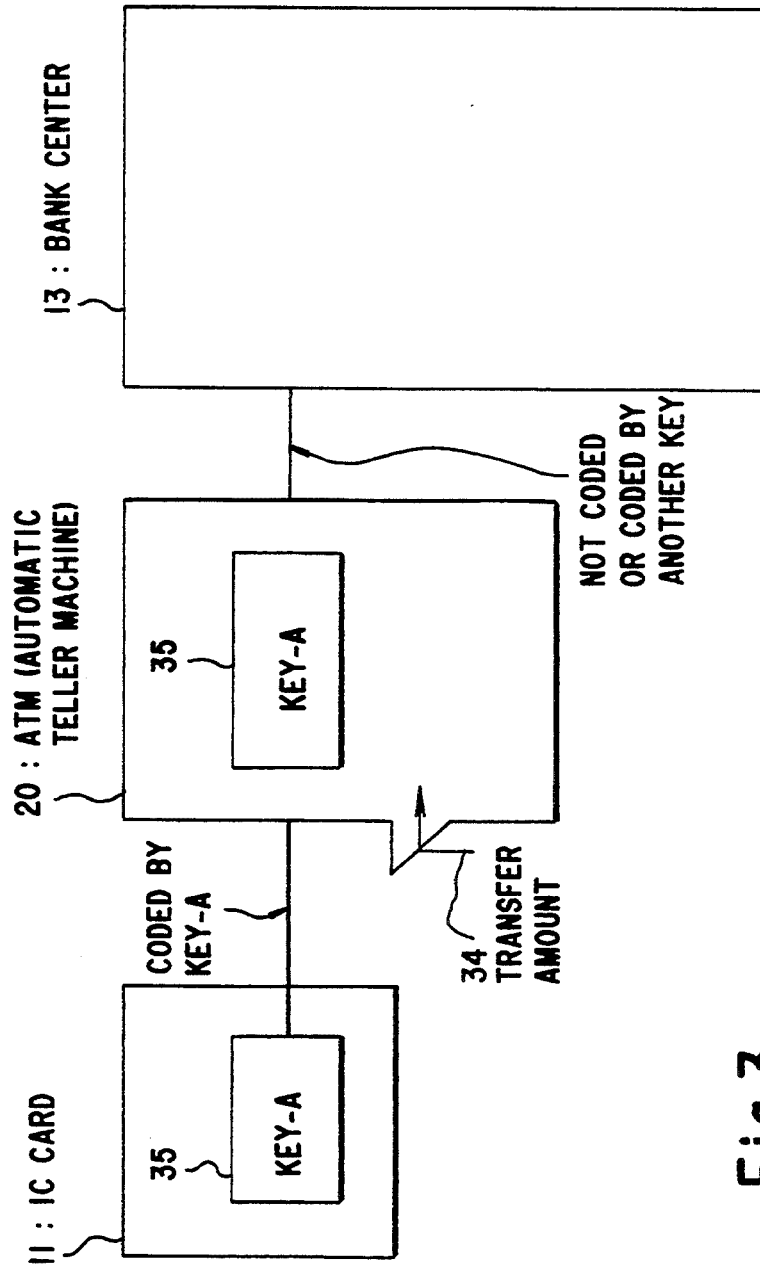


Fig.3

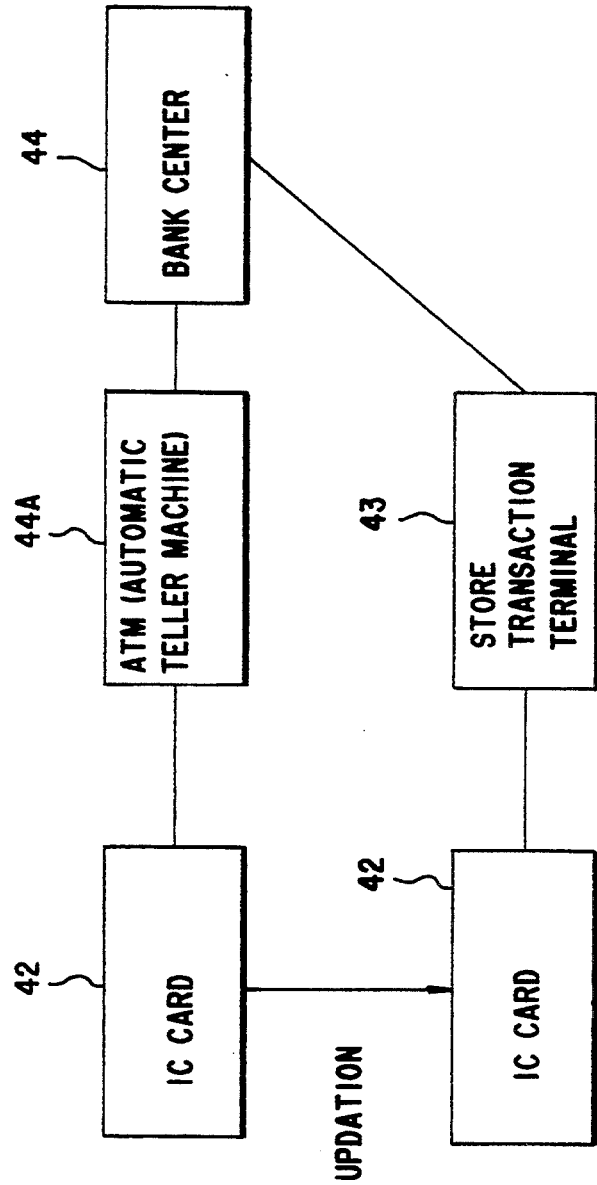


Fig.4

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