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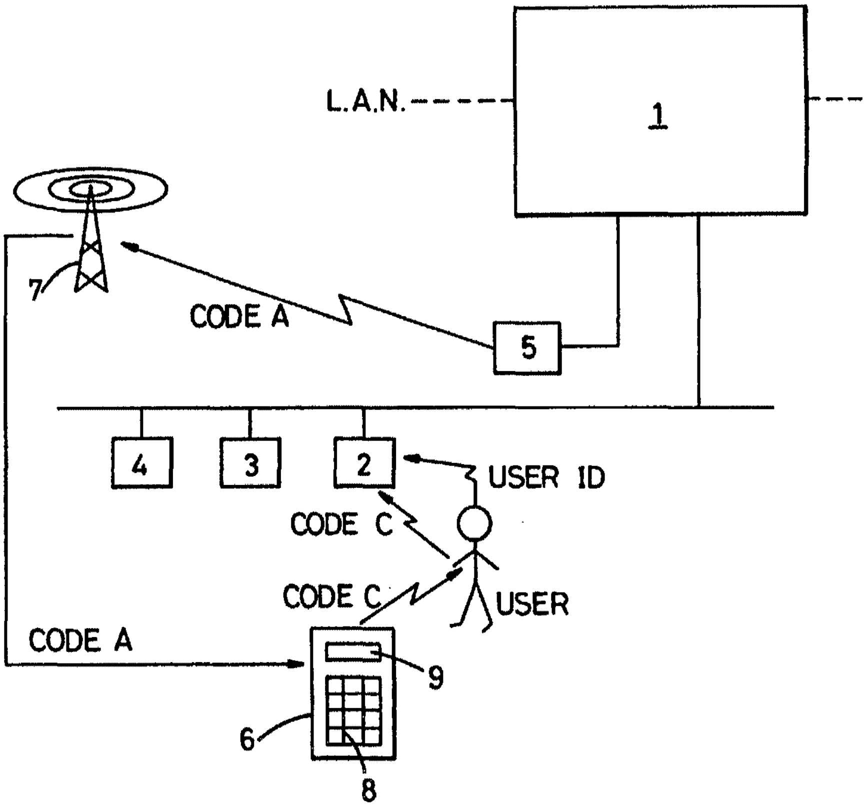
(54) Title: A COMPUTER SECURITY SYSTEM

(57) Abstract

A method of preventing unauthorised access to a host computer system (1) by a user at a remote terminal (2) is provided using paging system technology. In the method, a user inputs his user identification code input into the terminal (2) which transmits same to the host computer system (1). The system then generates a random code (Code A) and subjects Code A to a transformation characteristic of a transformation algorithm identified by the input user identification code so as to generate a transformed code (Code B). Code A is transmitted via a paging system (7), to a receiver (6) held by the user. The receiver (6) comprises transformation means adapted to transform the received Code A to a second transformed code (Code C), and means (9) for displaying Code C to the user. The user then inputs the displayed Code C to the terminal (2) which trasmits it to the host system (1). The input Code C is then compared with Code B and access is only permitted if Code C matches Code B.



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A COMPUTER SECURITY SYSTEM

The present invention relates to a computer security system and comprises a method and apparatus for preventing unauthorized access to a host computer system.

Many large computer systems require users to gain access via a remote terminal using a telephone link. In cases where access to the computer system is restricted to authorised personnel, attempts by unauthorised persons to gain access are referred to as "hacking". It is common practice for security systems to be installed in the computer system in an attempt to verify the identity of a user. However, to date no completely successful computer security system has been devised.

There has now been devised an improved computer security system based on pager technology.

According to a first aspect of the present invention there is provided a method of preventing unauthorised access to a host computer system by a user at a remote terminal comprising the steps of

accepting a user identification code input to the terminal by the user;

generating a random code (Code A);

subjecting Code A to a transformation characteristic of a transformation algorithm identified by the input user identification code so as to generate a transformed code (Code B);

transmitting Code A via a paging system, to a receiver held by the user, the receiver comprising transformation means adapted to transform the received Code A to a second transformed code (Code C), and means for displaying Code C to the user;

accepting input of Code C to the terminal by the user;

comparing Code C with Code B; and

permitting access to the host system only if Code C matches Code B.

According to a second aspect of the present invention there is provided apparatus for preventing unauthorized access to a host computer system by a user at a remote terminal, the apparatus comprising

means for accepting a user identification code input to the terminal by the user;

means for generating a random code (Code A), and for subjecting Code A to a transformation to generate a transformed code (Code B);

a transmitter for transmitting Code A via a paging system;

a receiver held by the user, the receiver comprising transformation means adapted to transform the received Code A to a second transformed code (Code C), and means for displaying Code C to the user;

means for accepting input of Code C by the user;

means for comparing Code C with Code B; and

means for permitting access to the host system if Code C matches Code B.

It will be appreciated that the receiver carried by an authorized user will have logic circuitry programmed with a transformation algorithm which is characteristic of that receiver. When the user enters his user identification code, the host computer system identifies the corresponding transformation algorithm in a database from the code and transforms the random code (Code A) to a new Code B in such a manner that the Code C, produced by the user's receiver from the transmitted code, will be identical to Code B with which it is compared. Thus, only a user both with knowledge of the user identification code and holding the corresponding receiver can gain access to the host system.

The transformation algorithms associated with each receiver may be completely different, or may be the same base algorithm which is convoluted with a code corresponding to the user's identification code so as to generate characteristic transformed codes. Preferably, the algorithms used are all, so called, one-way algorithms.

The user identification code should preferably be treated by the user as a secret code and not be marked on the receiver. It is thus comparable with a personal identification number (PIN) familiar from many other contexts.

Preferably also, the receiver can only be enabled for a predetermined period to permit it to transform the received Code A to the transformed Code C by input of a second user identification code by the user. This second code may also be in the form of a PIN. In this way additional security is provided since an unauthorised user cannot gain access to the system even if he has possession of the receiver and knows the user identification code without knowledge of the second identification or activation code.

Preferably also, the signal incorporating Code A which is transmitted by the paging system also incorporates an identifier to enable the receiver to pick out the signal from a plurality which may be being transmitted at the same time.

In addition, the receiver is preferably always responsive to reception of its identifier regardless of whether or not it has been enabled by the user. Hence, the receiver is responsive to reception of its identifier in circumstances when the authorised user is not attempting to gain access to the host system. In this way the receiver

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