

FIG.1

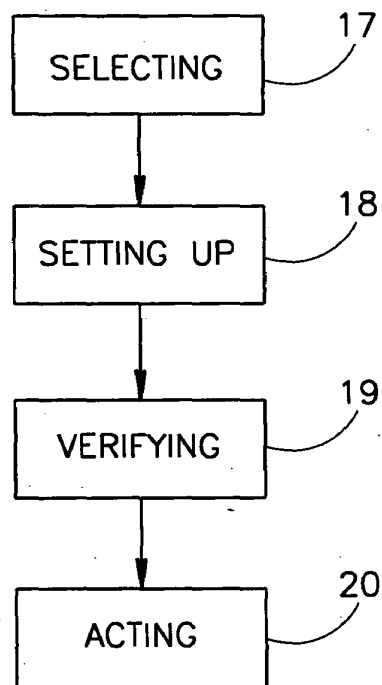


FIG.2

Method of Restricting Software Operation within A License Limitation

FIELD OF THE INVENTION

This invention relates to a method and system of identifying and restricting an unauthorized software program's operation.

BACKGROUND OF THE INVENTION

5 In S.A. Numerous methods have been devised for the identifying and restricting of unauthorized software program's operation. These methods have been primarily motivated by the grand proliferation of illegally copied software, which is engulfing the marketplace. This illegal copying represents billions of dollars in lost profits to commercial software developers.

10 Software based products have been developed to validate authorized software usage by writing a license signature onto the computer's volatile memory (e.g. hard disk). These products may be appropriate for restricting honest software users, but they are very vulnerable to attack at the hands of skilled system's programmers (e.g. "hackers"). These license signatures are
15 also subject to the physical instabilities of their volatile memory media.

In S.A. Hardware base products have also been developed to validate authorized software usage by accessing a dongle that is coupled e.g. to the parallel port of the P.C. These units are expensive, inconvenient, and not particularly suitable for software that may be sold by downloading (e.g. over
20 the internet).

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There is accordingly a need in the art to provide for a system and method that substantially reduce or overcome the drawbacks of hitherto known solutions.

5 **SUMMARY OF THE INVENTION**

The present invention relates to a method of restricting software operation within a license limitation. This method strongly relies on the use of a key and of a record, which have been written into the non-volatile memory of a computer.

10 For a better understanding of the underlying concept of the invention, there follows a specific non-limiting example. Thus, consider a conventional computer having a conventional BIOS module in which a key was embedded at the ROM section thereof, during manufacture. The key constitutes, effectively, a unique identification code for the host computer. It is important
15 to note that the key is stored in a non-volatile portion of the BIOS, i.e. it cannot be removed or modified.

Further, according to the invention, each application program that is to be licensed to run on the specified computer, is associated with a license record; that consists of author name, program name and number of licensed
20 users (for network). The license record may be held in either encrypted or explicit form.

Now, there commences an initial license establishment procedure, where a verification structure is set in the BIOS so as to indicate that the specified program is licensed to run on the specified computer. This is
25 implemented by encrypting the license record (or portion thereof) using said key (or portion thereof) exclusively or in conjunction with other identification information) as an encryption key. The resulting encrypted license record is stored in another (second) non-volatile section of the BIOS, e.g. E²PROM (or

the ROM). It should be noted that unlike the first non-volatile section, the data in the second non-volatile memory may optionally be erased or modified (using E²PROM manipulation commands), so as to enable to add, modify or remove licenses. The actual format of the license may include a string of terms that correspond to a license registration entry (e.g. lookup table entry or entries) at a license registration bureau (which will be further described as part of the preferred embodiment of the present invention).

Having placed the encrypted license record in the second non-volatile memory (e.g. the E²PROM), the process of verifying a license may be commenced. Thus, when a program is loaded into the memory of the computer, a so called license verifier application, that is *a priori* running in the computer, accesses the program under question, retrieves therefrom the license record, encrypts the record utilizing the specified unique key (as retrieved from the ROM section of the BIOS) and compares the so encrypted record to the encrypted records that reside in the E²PROM. In the case of match, the program is verified to run on the computer. If on the other hand the sought encrypted data record is not found in the E²PROM database, this means that the program under question is not properly licensed and appropriate application define action is invoked (e.g. informing to the user on the unlicensed status, halting the operation of the program under question etc.)

Those versed in the art will readily appreciate that any attempt to run a program at an unlicensed site will be immediately detected. Consider, for example, that a given application, say Lotus 123, is verified to run on a given computer having a first identification code (k1) stored in the ROM portion of the BIOS thereof. This obviously requires that the license record (LR) of the application after having been encrypted using k1 giving rise to (LR)_{k1} is stored in the E²PROM of the first computer.

Suppose now that a hacker attempts to run the specified application in a second computer having a second identification code (k2) stored in the

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