Title: TELEMATIC DUPLICATION SYSTEM FOR ENCODED KEYS

Abstract: A telematic duplication system for encoded keys, comprising: a plurality of profiling and/or duplicating and/or electronic encoding and/or marking machines (12, 14, 16, 18) installed at different duplication centres (2) and controllable electronically, at least one central control unit (6) provided with at least one electronic data file (20, 22), in which data relative to the corresponding key to be duplicated are associated with an indirect code, within said central unit, means for recognizing data relating to the lock into which the key is to be inserted, these data being possessed by the user alone, a telematic network for connecting said central unit (6) to said duplication centres (2) in order to transmit from these latter to said central unit said indirect code and the lock identification data, and, when recognition of said indirect code and lock identification data has taken place, to transmit from said central unit (6) to said duplication centres (2) the control signals for said machines (12, 14, 16, 18) in order to effect duplication of a key, of which said indirect code has previously been transmitted.
TELEMATIC DUPLICATION SYSTEM FOR ENCODED KEYS

The present invention relates to a telematic duplication system for encoded keys.

Keys (this term also including cards with electronic codes of smart card type) for operating a lock, whether installed in a normal door, an armoured door, a motor vehicle etc., are known to be generally distinguished by a code (indirect code) which enables the type of key, its mechanical notching pattern, the code of its electronic chip if present, etc. to be unequivocally identified.

From this indirect code, all the key characteristics required for its duplication can be obtained from a data file generally held by the manufacturer or initial lock installer.

In practice a user who mislays a key and requires a duplicate can apply with its indirect code number to a local key duplication centre, which will then request a duplicate from the manufacturer or from the initial lock installer. Key duplication is in this case an operation carried out in a place far from the local centre to which the customer has applied, the time involved, because of the need to despatch the key when cut, being lengthy and often incompatible with user requirements. This is certainly so in the case of a car driver who mislays the car key during a journey.

To this must be added the further problem of lack of confidentiality and hence of security.
Key duplication may be possible at the local centre, usually by simply "copying" the notching pattern of an original key onto a semi-finished key held by the local centre. This operation:
5 - requires the material presence of the original key,
- is not normally possible if the key is provide with an electronic chip, which has to be encoded,
- requires the specialist to have available a vast assortment of semi-finished keys in order to be able to satisfy the various customer requirements,
- provides no guarantee of security or confidentiality as anybody, not only the legitimate owner, can duplicate an original key.

An object of the invention is to overcome these drawbacks by making it possible to duplicate a key at any authorized duplication centre, hence not only obtaining all the advantages of local duplication but at the same time eliminating the aforesaid drawbacks.

This and other objects which will be apparent from the ensuing description are attained, according to the invention, by a telematic duplication system for encoded keys, as claimed in claim 1.

A preferred embodiment of the present invention and a variant thereof are described in detail hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of a telematic duplication system according to the invention, and

Figure 2 is a schematic view of a remote duplication centre.
As can be seen from the figures, the telematic duplication system for encoded keys according to the invention comprises substantially a plurality of remote key duplication centres 2 provided with a terminal 4 connected via a telematic network to a control unit 6 connected to data files 8 stored with lock manufacturing/installation firms, or firms authorized thereby.

The term "keys" means mechanical keys, electronic keys, i.e. cards with electronic codes of smart card type, or mixed keys, i.e. provided with a chip.

Each centre 2 comprises a plurality of power machines, such as profiling machines 12 for the key blank, milling machines 14 cutting the notching pattern on the semi-finished key, machines 16 for marking the key surface and machines 18 for encoding a possible chip present in the key, all these machines being controlled electronically by data received by the terminal 4 from the centre 2 and fed by the control unit 6.

The control unit 6 comprises a data file 20 in which the indirect key codes and other information, specified hereinafter, are correlated with the lock manufacturers/installers, and a data file 22 in which the direct key codes are correlated with the movements of the power machines 12, 14, 16, 18 of the remote centres 2.

The control unit 6 also comprises data encryption means 24 and data cancellation means 26.

The operation of the telematic system of the invention, for example for duplicating a motor vehicle key of which the indirect code is known, is as follows:
A user who has mislaid a key and requires a duplicate calls into one of the authorized centres 2 and hands the operator the card (obtained on acquiring the vehicle) carrying the impression of the indirect codes of the key to be duplicated. These indirect codes enable the type of key, its mechanical notching pattern and the code of its electronic chip, if present, to be unequivocally identified.

At this point the operator at the terminal 4 feeds its identifying codes to establish the connection with the control unit 6, and once identified by this latter feeds to it the indirect codes and possibly data relative to the key make and model, specifying at the same time the number of copies required. At the same time the operator invites the customer to key into the terminal the identifying data for the lock cylinder to which the key pertains, which data can be the production date, the batch, the registration number, the progressive number and any other information identifying the cylinder.

These data will have been handed to the user at the moment of purchase in a confidential manner, for example in a sealed envelope. For example the sealed envelope may contain a card, the faces of which carry the indirect codes and the cylinder identification data respectively, the user showing the operator, while holding the card in the hand, only that face carrying the indirect codes.

From this overall information the control unit 6 identifies the product and the lock manufacturer 10 (or initial or authorized installer) and feeds thereto the indirect code, the digital data of the applicant relative to the cylinder, and an unequivocal identification code for the transaction underway.
The data transmitted by the unit 6 and received by the firm 10 are compared with the data file 8 which, once verified, provides in response the direct codes associated with the indirect codes received. Specifically, said direct codes comprise those necessary for milling the profile of the blank, those for cutting the notching pattern, those for marking and those for encoding the chip, if present.

The direct codes are then fed, making reference to the transaction identification code, to the control unit 6 which on receipt transmits them, together with all information required by the power machines for materially carrying out the machining, in encrypted form to the terminal 4 of the centre 2 from which the key duplication request originated. In said centre all these data are transferred to the various power machines 12, 14, 16, 18 to enable them to effect the required operations in succession on the blank key, and in particular:

- regulating and operating the profiling machine to form the grooves on the blank and obtain the semi-finished key,
- regulating and operating the miller in sequence to cut the key notching pattern,
- regulating and operating the punching tool to effect marking,
- chip encoding.

On termination of the duplication operations the terminal 4 transmits confirmation to the control unit 6 that the operations have taken place, said unit 6 then cancelling all data of the effected transaction to prevent unauthorized repetition, and confirming to the firm 10 that these operations
have taken place. If the operation was not a success, the unit 6 informs the
firm 10 of the situation and cancels all data.

In a variant not shown in the drawings, the data files 8 are directly
associated with the control unit 6.

In a further variant, the terminals are provided with means 28 for
concealing the data received from the control unit 6.

From the foregoing it is apparent that the telematic system of the
invention presents numerous advantages, and in particular:
- it enables the key to be duplicated from its code without requiring its
  material presence,
- it also enables keys provided with a chip to be duplicated,
- it reduces the number of semi-finished keys which the operator has to
  keep in stock, it being sufficient to stock the key blank for these,
- it ensures a high level of security and confidentiality as only the legitimate
  holder possessing the indirect code number and the cylinder data can
  request duplication of the original key,
- it reduces the waiting time for the duplicated key as this is obtained
  directly from the authorized centre.
CLAIMS

1. A telematic duplication system for encoded keys, characterised by comprising:

- a plurality of profiling and/or duplicating and/or electronic encoding and/or marking machines (12, 14, 16, 18) installed at different duplication centres (2) and controllable electronically,

- at least one central control unit (6) provided with at least one electronic data file (20, 22), in which data relative to the corresponding key to be duplicated are associated with each indirect code,

- within said central unit, means for recognizing data relating to the lock into which the key is to be inserted, these data being possessed by the user alone,

- a telematic network for connecting said central unit (6) to said duplication centres (2) in order to transmit from these latter to said central unit said indirect code and the lock identification data, and, when recognition of said indirect code and lock identification data has taken place, to transmit from said central unit (6) to said duplication centres (2) the control signals for said machines (12, 14, 16, 18) in order to effect duplication of a key, of which said indirect code has previously been transmitted.

2. A system as claimed in claim 1, characterised in that the central unit (6) is connected telematically to a plurality of key manufacturing firms in order to transmit thereto the key indirect codes and the lock identification data and, when said data have been recognized, to receive therefrom the
corresponding associated direct codes for controlling said machines (12, 14, 16, 18).

3. A system as claimed in claim 1, characterised in that the central control unit (6) comprises means (24) for encrypting the data transmitted to the production centres (2).

4. A system as claimed in claim 1, characterised in that said duplication centres comprise means (28) for concealing the data received from the control unit (6).

5. A system as claimed in claim 1, characterised in that the control unit (6) comprises data cancellation means (26).

6. A system as claimed in claim 1, characterised in that the lock identification data are its production date.

7. A system as claimed in claim 1, characterised in that the lock identification data are the registration number.

8. A system as claimed in claim 1, characterised in that the lock identification data are the progressive number.

9. A system as claimed in claim 1, characterised in that the lock identification data are the production batch.

10. A system as claimed in claim 1, characterised in that the lock identification data are a random number.

11. A system as claimed in claim 1, characterised in that the lock identification data relate to the lock cylinder.
A. CLASSIFICATION OF SUBJECT MATTER

B23C3/35

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B2C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X Further documents are listed in the continuation of box C. X Patent family members are listed in annexe.

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Date of the actual completion of the international search

8 December 2005

Date of mailing of the International search report

19/12/2005

Name and mailing address of the ISA

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