(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 704 826 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.04.1996 Bulletin 1996/14

(51) Int. Cl.[6]: **G07F 17/12**, G07C 9/00, G07F 7/00

(21) Application number: **95850150.4**

(22) Date of filing: **31.08.1995**

(84) Designated Contracting States:
DE ES FR GB

(30) Priority: **01.09.1994 SE 9402905**

(71) Applicant: **AB Brana**
S-921 28 Lycksele (SE)

(72) Inventor: **Lindström, Nils-Arne**
S-921 23 Lycksele (SE)

(74) Representative: **Hammond, Andrew et al**
Albihn West AB
Box 142
S-401 22 Göteborg (SE)

(54) Arrangement and method for utilizing a lockable space

(57) The invention relates to an arrangement for utilizing a lockable space (2), which arrangment comprises a locking device (3) which is lockable by means of a controllable lock (4). The invention is characterized in that it comprises a reading device (1) adapted for reading an information-bearing card, which reading device (1) is connected to the lock (4) and to a memory unit (5) for storing of information read by means of the reading device (1), wherein the reading device (1) comprises means for setting the lock (4) in a locked alternatively unlocked condition depending on information read from a card and information stored in the memory unit (5). By means of the invention, an arrangement for lockers and similar lockable spaces is provided, in which a customer does not have to use coins in order to release a key.

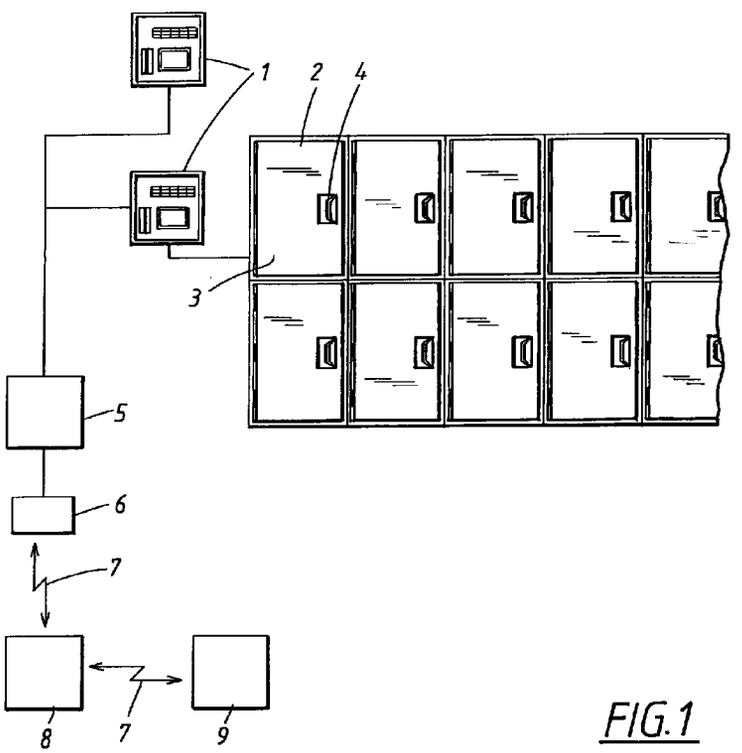

FIG.1

EP 0 704 826 A2

Description

TECHNICAL FIELD:

The present invention relates to an arrangement for utilizing a lockable space, which arrangement comprises a locking device which is lockable by means of a controllable lock. The invention also relates to a method for utilizing a lockable space.

BACKGROUND OF THE INVENTION:

At airports, railway stations and other public places, lockers for storage of luggage and the like can be found. Conventional lockers operate according to the principle that a certain fee is inserted in a coin slot, after which the box can be locked and a key is released. By means of the key, the box can be unlocked later. Alternatively, after paying the fee a paper slip can be fed out, which slip indicates a code which is entered on a key pad when the locker is to be opened again.

A problem which concerns conventional lockers is that the customers wishing to use the boxes must have small change available. This is a particularly large problem in those cases where the customers are travelling abroad, and have not yet been able to acquire coins of correct currency. Furthermore, no receipt of the paid fee is normally given, which is a drawback for business travellers who are obliged to verify their expenses during their travels.

Another problem with conventional lockers is that the coin receptacles of the lockers must be emptied regularly, something which is costly.

Furthermore, there is a risk that the customer loses the key, which obviously also is a problem. The system which uses a paper slip on which a code is indicated obviously suffers from the drawback that the customer may risk losing the paper slip.

The above-mentioned problems are present not just in connection with lockers for luggage, but also in other situations where there is a need for temporary storage of valuable goods. For example, such a situation is also present in connection with parking lots for vehicles.

SUMMARY OF THE INVENTION:

A main object of the present invention is to provide a device in connection with lockers and similar lockable spaces, in which the above-mentioned problems and drawbacks are solved, and in which the customer does not have to use coins in order to release a key. This is accomplished by means of a device of the kind mentioned initially, which is characterized in that it comprises a reading device adapted for reading of an information-bearing card, which reading device is connected to the lock and to a memory unit for storing of information read by means of the reading device, wherein the reading device comprises means for setting of the lock in a locked, alternatively unlocked, condition depending on information read from a card and information stored in the memory unit.

By means of a credit card or an equivalent magnetic card which can be read by means of a card reader, the customer does not have to keep a special key for opening of the locker. Instead, the credit card itself functions as a key. According to a particular embodiment in which the card reader communicates with a central computer, an automatic charging can also be carried out.

BRIEF DESCRIPTION OF THE DRAWINGS:

The invention will now be described with reference to the appended drawings, in which:

Fig. 1 shows, in the form of a block diagram, a device according to the present invention,

Fig. 2 shows a combined display and card reader for use with the invention, and

Fig. 3 is a flow chart illustrating the operation of the invention.

PREFERRED EMBODIMENTS:

In Fig. 1, a device according to the present invention is shown schematically. According to a preferred embodiment, the device comprises a card reader 1 for reading credit cards or equivalent information-bearing cards in which information regarding the identity of the card's owner, the validity time of the card, etc., is stored. Conneced to the card reader 1 is at least one, preferably several, lockers 2. Each one of the lockers 2 comprises a door 3 which can be locked by means of a lock 4, which can be controlled electrically for locking and unlocking thereof in a manner which is known per se.

According to that which will be described below, the card reader 1 comprises a computer unit which is adapted to read a credit card and, under certain conditions, to generate signals which are transmitted via electrical wires (not shown) to a lock 4 for unlocking or locking thereof.

Furthermore, the card reader 1 is connected to a computer-based memory unit 5 which is adapted to store information which is read and delivered by means of the card reader 1. The stored information can relate to the point in time of the reading of a certain credit card (i.e. the point in time when a customer begins using a particular locker 2), the type of credit card being used, the validity of the card etc. The information which is read from the card can then form a basis for computing the time which the customer should be charged for.

The memory unit 5 is connected to a telephone modem 6 of conventional type, which is adapted to communicate with a central computer via the public telephone network 7. The central computer 8, which of course can be adapted to communicate with a plurality of card readers, is responsible for the administration of

the charging, i.e. it receives information regarding which card has been used for utilizing a certain locker and for how long the locker has been utilized. From this information, a certain charging amount is calculated in the central computer 8. To this end, the central computer 8 is adapted to gather the above-mentioned information from the memory unit 5 at certain time intervals. Moreover, the central computer 8 is adapted to communicate (via the telephone network 7) with the respective credit card company so that the customers can be charged.

According to that which is shown in Fig. 2, the card reader 1 comprises a reading unit 10 through which a customer can pass a credit card. The card reader 1 also comprises a computer unit (not shown) which, by means of a computer program, controls the reading of the credit card when this is brought through the reading unit 10. During reading of a credit card, information which is stored in the credit card (regarding the card's owner, the validity time, etc.) is recorded in the computer unit. Furthermore, the card reader 1 comprises a display 11 which is adapted to present various messages to the customer, for example "All lockers occupied", "The card is not valid", etc., according to that which will be described below.

The card reader 1 can be provided with several keys 12 which can correspond to different services. For example, by pressing a particular key, the customer may indicate that he wishes to use more than one locker on one particular occasion. Alternatively, by pressing another key the customer can choose the locker size (in the case where the card reader is connected to a plurality of lockers of different sizes). In that case, the charging can be based on the size of the locker chosen by the customer.

In Fig. 3, a flow chart illustrating the operation of the device according to the present invention is shown. Before a customer can use a locker the system must first confirm that at least one box is available (box 13). This is possible since the card reader is connected to a certain number of locks and the card reader's computer unit contains information regarding which locks are unlocked and locked, respectively (due to the fact that information regarding those locks to which signals for unlocking and locking, respectively, have been transmitted is stored in the computer unit). If all of the lockers belonging to a certain card reader are occupied, the text "All lockers occupied" or the like is shown on the card reader's display (box 14). If at least one locker is available, the reading of a credit card is enabled (box 15) and consequently the text "Welcome! Please pass your card through the reader" or the like is shown on the display.

When the card has been read by means of the card reader, the card reader's computer unit checks whether the card is "valid", "active" or "invalid" (box 16). A "valid" card should be defined as one being ready for use, in order to start utilizing a particular locker. An "active" card defines that a locker has been utilized a certain time period and is now to be unlocked. Finally, an "invalid" card is one having a validity time which has expired, alternatively that the card could not be read in a proper manner. If a read credit card is judged by the system to be invalid, the display of the card reader will show the text "The card is invalid" during a certain time period, for example 30 seconds (box 17). After that, the customer may, if so desired, make another attempt to have the card read.

If the read card is judged to be "valid", the card reader locks the lock which belongs to a certain unoccupied locker, the door of which stands ajar (box 18). After that, the text "Please use locker no. 12" or the like is shown on the display (box 19). The customer can then place his luggage in the locker in question and close the door, after which the locker will be locked. The point in time for locking of the locker will be registered by the card reader's computer unit and stored in the memory unit.

When the customer later comes back to collect his luggage, he must pass his credit card through the reading unit once again. If the credit card is still operative, the card reader will observe that the card is "active", i.e. that the same credit card has been used at a certain earlier point in time in order to lock a certain locker. In this way, the lock in question will be unlocked and the customer may collect his luggage (box 20). The point in time corresponding to the reading of the card is once again recorded by the card reader and stored in the memory unit. By a comparison of the points in time for the locking and the unlocking of a certain locker, the system is able to calculate a basis for the charging (box 21). After that, the text "You have used box no. 12 for 4 hours. We will charge your credit card 20:-" or the like can be shown on the display (box 22). The information regarding the charging will then be transmitted to a central computer for charging of the respective credit card company, in accordance with the above-mentioned.

The very first time a certain card is read it is in the "valid" state (i.e. the memory unit 5 lacks information that the card has been used in the card reader in question), which state corresponds to the situation that a certain locker is to be used by the customer. Information regarding the identity of the card and the point in time for the reading is stored in the memory unit. The second time the same card is read, a comparison between the read information and the information which was stored in the memory unit 5 during the first reading is made. In this regard, the card reader's Computer unit can establish that the same card has been read at a certain earlier occasion and that the lock was locked on that occasion. This indicates that the card is in the "active" state, which is equivalent to the case where the customer wishes to open the lock and collect his luggage.

An important principle behind the invention is that it comprises means, i.e. the card reader, for setting the lock 4 in a certain locked position upon a reading of a card and in an open position upon a subsequent reading of the same card. These setting are made dependent on the information which is read from the card and the information which is stored in the memory unit 5. Thus, the same card is used when a customer starts utilizing a locker (i.e. when he intends to place his luggage or the

like in the locker) and when he intends to unlock the box (i.e. when he wishes to empty it of its contents). The invention implies that neither keys nor code slips have to be used in order to lock or unlock a certain locker, which is an advantage which simplifies the operation as compared with previously known systems. The invention is adapted for use with conventional credit cards, which provides for a simple operation.

The invention is not limited to the above-mentioned embodiments, but may be varied within the scope of the appended claims. For example, it is apparent that other types of information-bearing cards can be used in connection with the invention, for example cards for automatic cash dispensing machines, telephone cards or petrol cards.

Furthermore, a card reader 1 can be connected to one single locker 2. In this regard, one single reading unit comprising a card reader and a lock (which of course, in turn, can be connected to a modem and a memory unit) is used. In this case, no display is necessary. Instead, for example a green and a red light emitting diode indicating an available, alternatively an occupied locker, can be used.

Also, the communication between the modem 6 and the central computer 8 and between the central computer 8 and the respective credit card company can be carried out via permanent cable lines or radio connections instead of the public telephone network. Also, the connection between the card reader and the respective lock may be wireless, for example via a radio connection.

Furthermore, a special "main card" of the same kind as a main key can be attached to the system, by means of which a large number of locks can be unlocked. Such a "main card" can be utilized in order to open the lockers for example if the customers do not collect their luggage within a certain time period.

The invention can also be used for other lockable spaces than lockers. For example, a parking space (either in the form of a single parking place or a parking lot having a number of parking places) for vehicles can be blocked by means of a vertically adjustable bar, the function of which can be controlled in the above-mentioned manner.

Claims

1. Arrangement for utilizing a lockable space (2), which arrangement comprises a locking device (3) which is lockable by means of a controllable lock (4), **characterized in** that the arrangement comprises a reading device (1) adapted for reading of an information-bearing card, which reading device (1) is connected to the lock (4) and to a memory unit (5) for storing of information read by means of the reading device (1), wherein the reading device (1) comprises means for setting the lock (4) in a locked, alternatively unlocked condition depending on information read from a card and information stored in the memory unit (5).

2. Arrangement according to claim 1, **characterized in** that the reading device (1) comprises means for setting of the lock (4), depending on information read from a card and information stored in the memory unit (5), in a locked position upon a reading of a card and in an unlocked position upon a subsequent reading of the same card.

3. Arrangement according to claim 1 or 2, **characterized in** that said reading device (1) comprises a display (11) for presenting predetermined messages depending on information read from a card and information stored in the memory unit (5).

4. Arrangement according to any one of the preceding claims, **characterized in** that it comprises means (1, 5) for determining the time period which has elapsed between two subsequent readings of the same card.

5. Method for utilizing a lockable space, which space comprises a door (3) which is lockable by means of a controllable lock (4), **characterized in** that the method comprises the following steps: reading of information from an information-bearing card by means of a reading device (1) connected to the lock (4), storing of the read information in a memory unit (5) connected to the reading device (1), and setting of the lock (4) in a locked, alternatively unlocked position, depending on information read from a card and information stored in the memory unit (5).

6. Method according to claim 5, **characterized in** that it furthermore comprises a presentation of predetermined messages indicating the state of the lock (4), and information read from the card and information in the memory unit (5), on a display (11) belonging to the reading device (1).

7. Method according to claim 5 or 6, **characterized in** that it furthermore comprises a control of whether at least one lock (4), which is connected to the reading device (1), is unlocked.

8. Method according to any one of claims 5-7, **characterized in** that the time which elapses between two subsequent readings of the same card is recorded in the memory unit (5) and is used during a charging procedure.

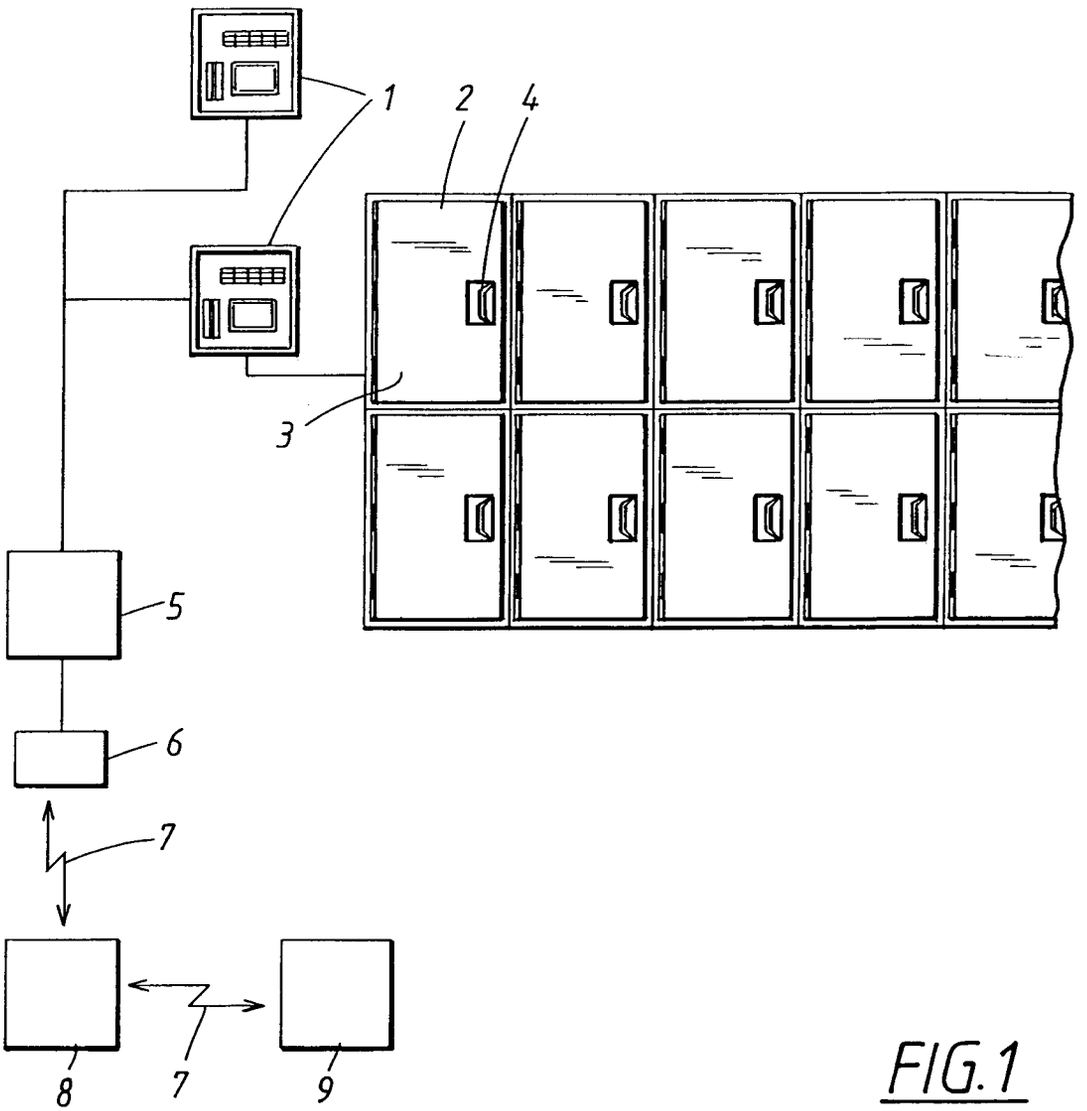

FIG.1

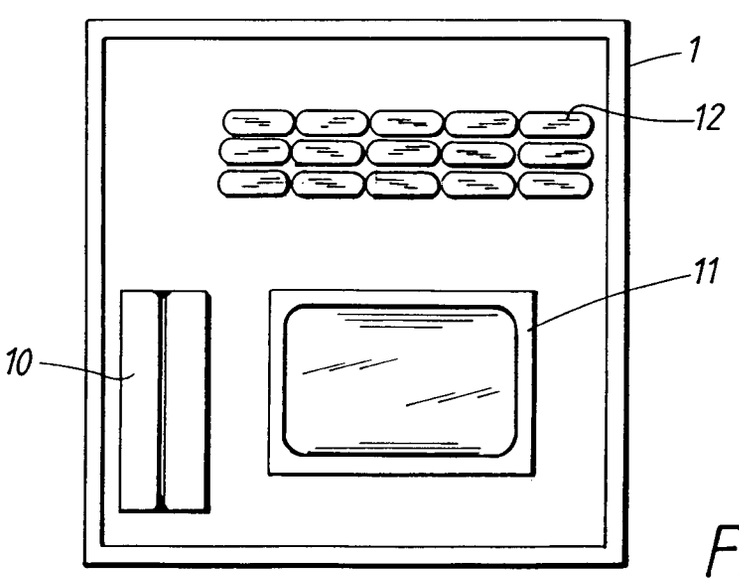

FIG.2

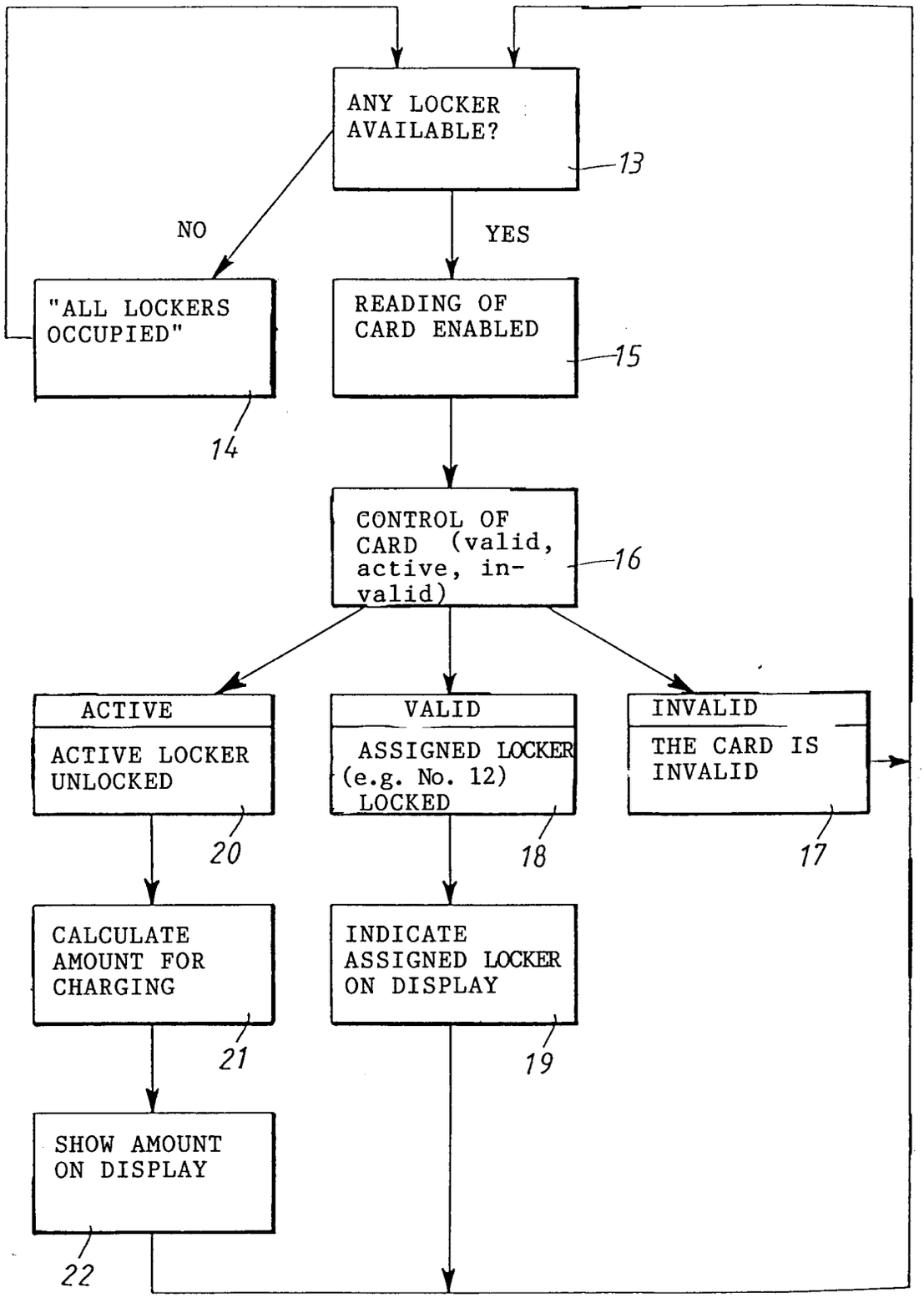
ANY LOCKER AVAILABLE?
13
NO
YES
"ALL LOCKERS OCCUPIED"
14
READING OF CARD ENABLED
15
CONTROL OF CARD (valid, active, in-valid)
16
ACTIVE
ACTIVE LOCKER UNLOCKED
20
VALID
ASSIGNED LOCKER (e.g. No. 12) LOCKED
18
INVALID
THE CARD IS INVALID
17
CALCULATE AMOUNT FOR CHARGING
21
INDICATE ASSIGNED LOCKER ON DISPLAY
19
SHOW AMOUNT ON DISPLAY
22

FIG.3