



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 714 068 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.05.1996 Bulletin 1996/22

(51) Int. Cl.⁶: **G06F 17/60**

(21) Application number: **95118005.8**

(22) Date of filing: **15.11.1995**

(84) Designated Contracting States:
AT CH DE FR IT LI

(30) Priority: **22.11.1994 IT PC940023**

(71) Applicant: **Bonafini, Paolo**
I-38088 Spiazzo di Trento (IT)

(72) Inventor: **Bonafini, Paolo**
I-38088 Spiazzo di Trento (IT)

(74) Representative: **La Ciura, Salvatore**
Via Francesco Sforza, 3
I-20122 Milano (IT)

(54) **Control system for object storage devices, especially for ski racks and related equipment**

(57) The invention relates to a ski storage rack control system and apparatus, in which each rack consists of a set of compartments and a lock control processor (11) connected to an external control processor (15), which in turn is controlled by a main computer (16), comprising:

- the input into and storage in the said external control computer (15) of a code univocally associated with the user;
- the association of the said code with the selected compartment number;
- locking of the compartment when the compartment number is entered by the user;
- re-input of the user code into external control computer (15) after the compartment unlocking enable has been given by the plant manager via central control computer (16);
- comparison of this code with the code previously stored, following which unlocking of the compartment is enabled.

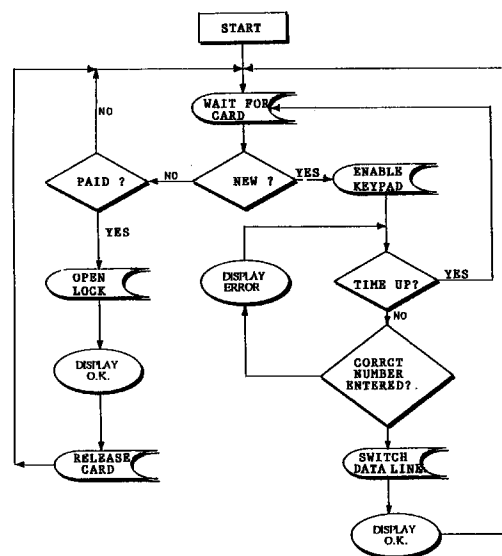


FIG. 2

EP 0 714 068 A2

Description

This invention proposes a system and the related equipment for the control and management of object storage devices, in particular for the management and control of ski racks for use at ski resorts.

In particular, the system in accordance with the invention comprises a plant consisting of a logic unit which controls ski rack locks, a logic unit which controls (i) input devices (bar-code or magnetic card readers and alphanumeric keypads) and (ii) the above-mentioned logic unit, and a main computer for the management of the entire system, to which the other logic units are connected.

This system operates as follows:

- a code univocally correlated with a user is input into and stored in the external control unit by means of a bar-code or magnetic card reader;
- the said code is associated with the number of the selected compartment when the user enters the compartment number on the keypad;
- the compartment locks when the user enters the compartment number;
- unlocking of the compartment is subsequently enabled when the plant manager enters the number of the compartment to be unlocked;
- the user code is input into the external computer again by means of the bar-code or magnetic card reader;
- the code previously stored in the external computer is compared with the user code input, and the compartment associated with it is unlocked if the plant manager has given the enable by entering the corresponding compartment number.

With the system in accordance with the invention, dual control is therefore possible; on the one hand, the manager can ensure that the rack unlocking enable is only given when the hire charge is paid, and on the other, the user is protected, because the rack can only be unlocked to remove the skis with the personal code in his/her possession.

We will refer below to the specific case of ski racks and the like, but the same system could well be applied in different fields, e.g. to ski boot storage units, to control the doors of left-luggage compartments, etc., while still remaining within the ambit of this invention.

The invention falls into the category of equipment for the temporary storage of objects, in particular in the field of equipment for ski resorts, where the problem arises of temporarily leaving skis, for example while having a meal, without running the risk of their being stolen or tampered with.

Normally, in accordance with the state of the art, skis are placed in a rack or similar device with a lock; when the skis have been locked in the rack the user keeps the key, which is subsequently used to unlock the compartment.

The common ski racks currently used have normal metal locks or coin-operated locks similar to those used for supermarket trolleys. However, these systems are impractical to use, expensive, and present maintenance problems if installed in low-temperature environments.

The problem of obtaining equipment which enables skis to be safely deposited for a limited period of time therefore arises.

To prevent this problem, this invention proposes a ski storage rack control system in which the racks are connected to two logical control units, which in turn are controlled by a main computer.

The first unit controls opening and closing of the locks.

The second external logic unit receives data from the input devices, such as keypads and bar-code or magnetic card readers, and controls the first unit which opens and closes the locks.

This second unit is also connected to the main computer, by means of which the plant manager can enable unlocking of the compartment after payment of the hire charge, following which the compartment is automatically unlocked when the user re-enters his code in the input devices.

In this way the user can place his skis in a compartment and lock it. He then inputs a code which might be, for example, the code of the ski-lift season ticket, and enters the compartment number used on the keypad.

The compartment then locks.

Finally, in order to collect the skis the user must pay the hire charge to the plant manager, who notifies the main computer that payment has been made by entering the number of the compartment to be unlocked.

The lock will open when the external control unit reads the magnetic card and checks that the code corresponds to one stored and that payment has been made.

The system in accordance with the invention could preferably be managed at a distance by a single person. This job could be done, for example, by the person who sells the ski-lift tickets or the cashier, with no need to hire new staff.

This and other purposes are achieved by the system and related equipment in accordance with the invention, which will now be described in detail, by way of example but not of limitation, by reference to the annexed figures in which:

- figure 1 contains the block diagram of a possible configuration of a plant in accordance with the invention;
- figure 2 is a flow chart relating to the plant management system;
- figure 3 schematically illustrates a rack for the introduction and storage of skis;
- figure 4 is a perspective view of a detail of the rack compartment locking and unlocking control devices;
- figure 5 is a side view of the devices shown in figure 3.

In figure 3, no. 1 indicates the ski rack assembly consisting of a metal structure comprising a number of pairs of arms 2, each of which, together with its support, constitutes a compartment for the introduction of one or more pairs of skis.

Each of these compartments has a locking device, a possible design of which is illustrated in figures 4 and 5.

With reference to the latter figures, this closing device comprises a pair of supports 4 welded to arms 2; the said supports are fitted with a shaft 5, to which a compartment closing arm 6 is hinged, and an electromagnet 7 which acts on a pin 8, pushed outwards by a spring 9 to insert it into an opening 10 in arm 6 when the latter is in the compartment locking position.

This position is shown in figures 4 and 5.

Each electromagnet 7 is controlled in a known way by the processor-driven logical control unit shown as no. 11 in figure 1; the said unit is connected to an external microprocessor 15, controlled in turn by a main computer 16, which manages the plant. The number of racks can be increased. In this case each rack, e.g. with 10 locks, is controlled by a processor 11 which locks and unlocks the compartments and is controlled by external logic unit 15; the latter is connected to main computer 16, as shown in figure 1 which illustrates the units making up the system.

Main computer 16 is connected via a serial port to external microprocessor 15. Via external processor 15, main computer 16 controls the operation of the system in accordance with a program whose flow chart is summarised in figure 2. Computer 16 also collects operational data in a data base, such as frequency of use of the locks or the time the skis remain in the compartment. Both the data base and the management program can be devised in a known way by an expert in the field, and are therefore not illustrated here.

No. 15 indicates the external processor which collects the data received from bar-code or magnetic card reader 12 and from keypad 13, and sends it to the serial port of computer 16. It also carries out commands received from main computer 16 by sending messages to display 14 and output commands to processor 11 (processor 11, keypad 13 and display 14 are not illustrated in figure 3, which schematically shows a casing, indicated as no. 3, that contains them).

No. 11 indicates the lock control processor which carries out the locking and unlocking commands sent by computer 16 via processor 15. As mentioned, the number of racks can be increased, in which case a number of lock control processors will be connected via processor 15 to main computer 16.

The operation of the system will be understood by analysing figure 2, which contains the flow chart of the program run by computer 16.

Via a command sent to processor 15 (wait for card), the computer activates the bar-code or magnetic card reader. The user who has just placed his skis in an unlocked compartment inserts his card for reading. If the card does not correspond to one associated with a

locked compartment (ie. it is a new one), the keypad is enabled (enable keypad). The user enters the number of the compartment in which he has placed the skis, and if the number entered is correct (ie. is not a non-existent number and does not correspond to a compartment already occupied), the compartment is locked and the program started.

The program goes back to the start, and places the bar-code or magnetic card reader on hold (wait for card). Users who have paid for the hire of the compartment insert their cards again when they are ready to collect their skis. This time the computer recognises that the card is not new, as it corresponds to a locked compartment. If the hire of the compartment has been paid for and the restaurant manager has confirmed payment by entering the customers compartment number at the time of payment, the computer orders the compartment to be unlocked, displays a confirmation message (display OK message), releases the card and returns to its initial status.

It is also possible to include the external processors 11 and 15 in the main computer 16, even if this requires the use of a large number of cables to connect the racks with the computer.

As will be clear from the above description, the system in accordance with the invention on the one hand provides efficient ski storage as it is only possible to collect the skis by entering the code stored at the time of deposit, and on the other hand allows the plant manager to manage the ski racks with no need for specific personnel, as the equipment can be monitored via the main computer.

The system in accordance with the invention could obviously be used in various fields, e.g. left-luggage offices, etc., and an expert in the field could devise numerous modifications and variations, all of which should be considered to fall within the scope of this invention.

Thus, for example, lock control processors 11 could be incorporated in external processor 15, or lock control processors 11 and external processor 15 could both be incorporated in main computer 16, obviously with a sufficient number of cables to connect computer 16 to the locks.

Claims

1. Ski storage rack control system in which each rack consists of a set of compartments fitted with locks connected to a processor (16), characterised by the fact that it involves:

- the input into and storage in the said computer of a code univocally associated with the user;
- the association of the said code with the selected compartment number;
- locking of the compartment;

- re-input of the user code into the computer after the compartment unlocking enable has been given by the plant manager via computer (16);
 - comparison of this code with the code previously stored, following which unlocking of the compartment is enabled. 5
2. Ski storage rack control system in accordance with claim 1, in which each rack consists of a set of compartments and a lock control processor (11) connected to an external control processor (15), which in turn is controlled by a main computer (16), characterised by the fact that it involves: 10
- the input into and storage in the said external control computer (15) of a code univocally associated with the user; 15
 - the association of the said code with the selected compartment number;
 - locking of the compartment when the compartment number is entered by the user; 20
 - re-input of the user code into external control computer (15) after the compartment unlocking enable has been given by the plant manager via central control computer (16); 25
 - comparison of this code with the code previously stored, following which unlocking of the compartment is enabled.
3. Ski rack storage control system in accordance with claim 2, in which the lock control processor is managed by the external processor (15), external processor (15) is managed by the main computer (16), and the code and compartment data are input by the user into external control computer (15). 30 35
4. Equipment for the storage of objects, especially skis, of the type comprising a number of compartments in which the objects to be stored are inserted, characterised by the fact that it includes: 40
- a rack lock control processor (11);
 - an external processor (15), which is controlled by a main computer (16) and controls the said processor (11); 45
 - systems for introducing and storing a user identification code in the said external computer (15);
 - systems for associating the said code with the compartment number; 50
 - systems for giving the compartment unlocking enable to the said external processor (15) via the said central unit;
 - systems for comparing a code input by the user at the time of collection with the code previously stored and, if the central unit enables compartment opening, unlocking the compartment. 55

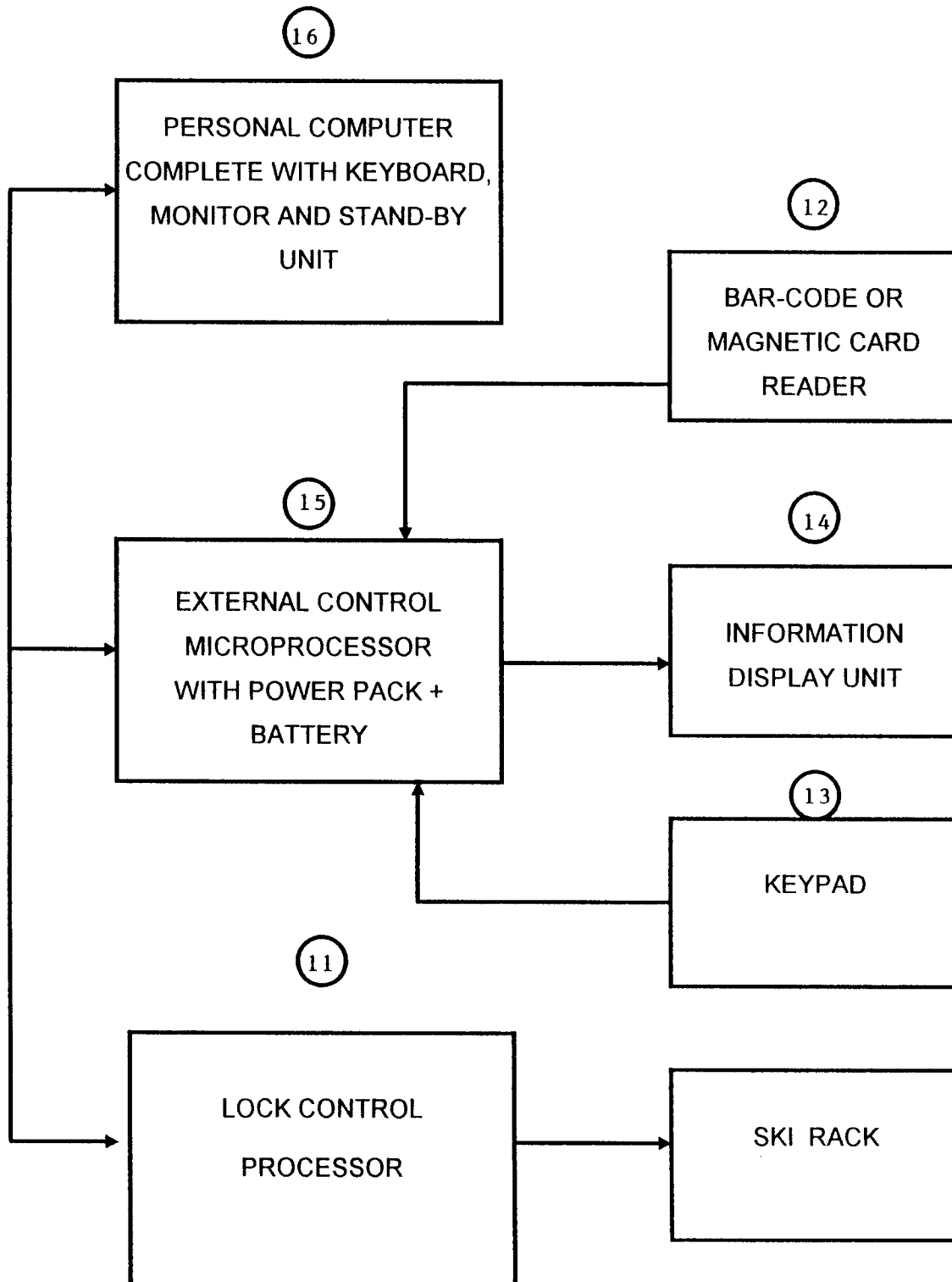


FIG. 1

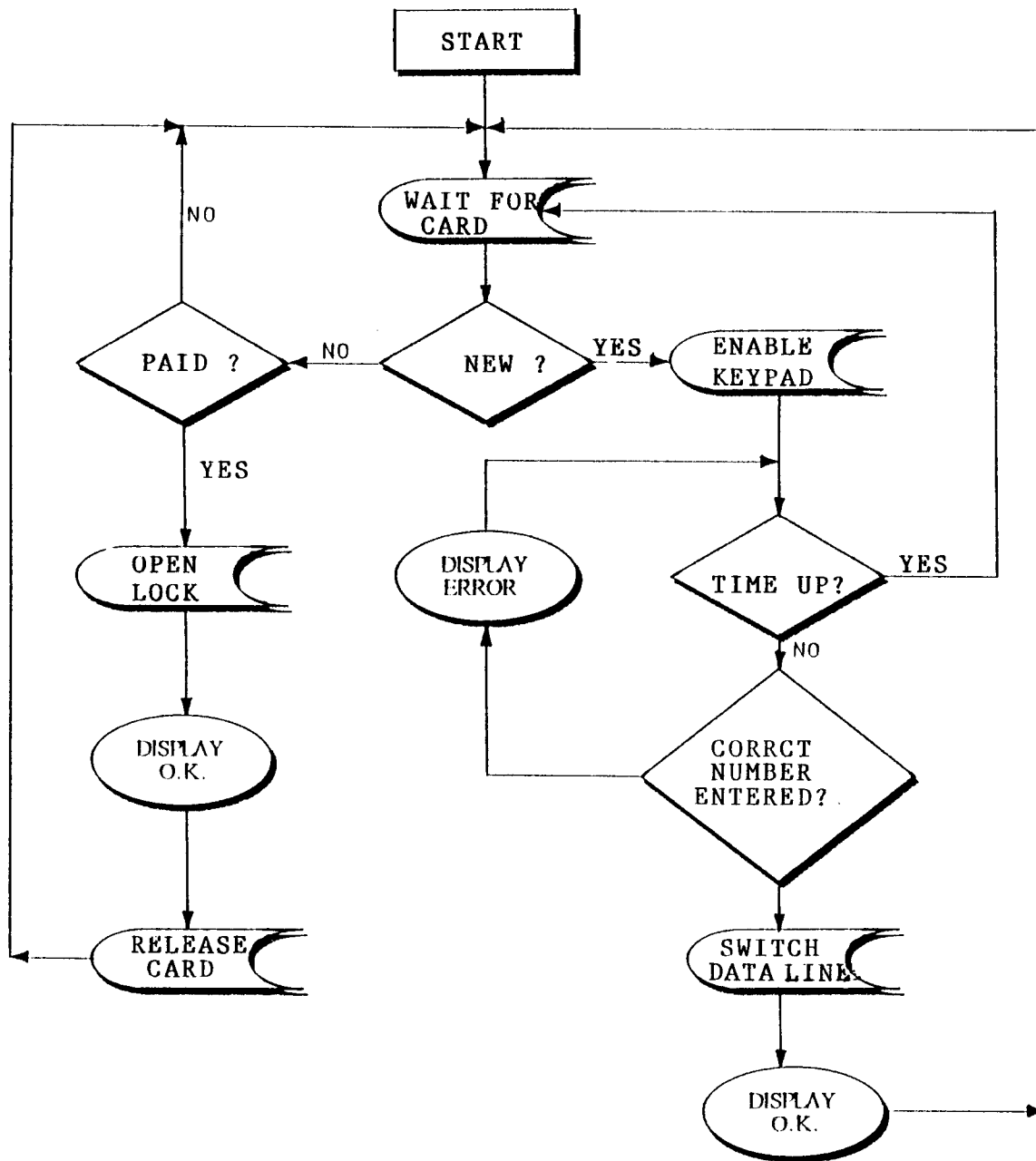


FIG. 2

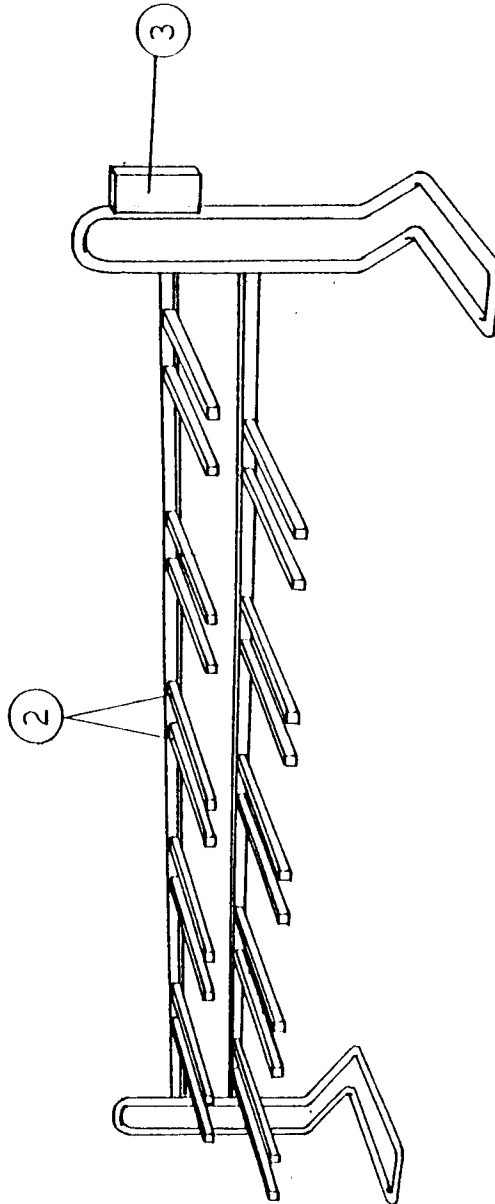
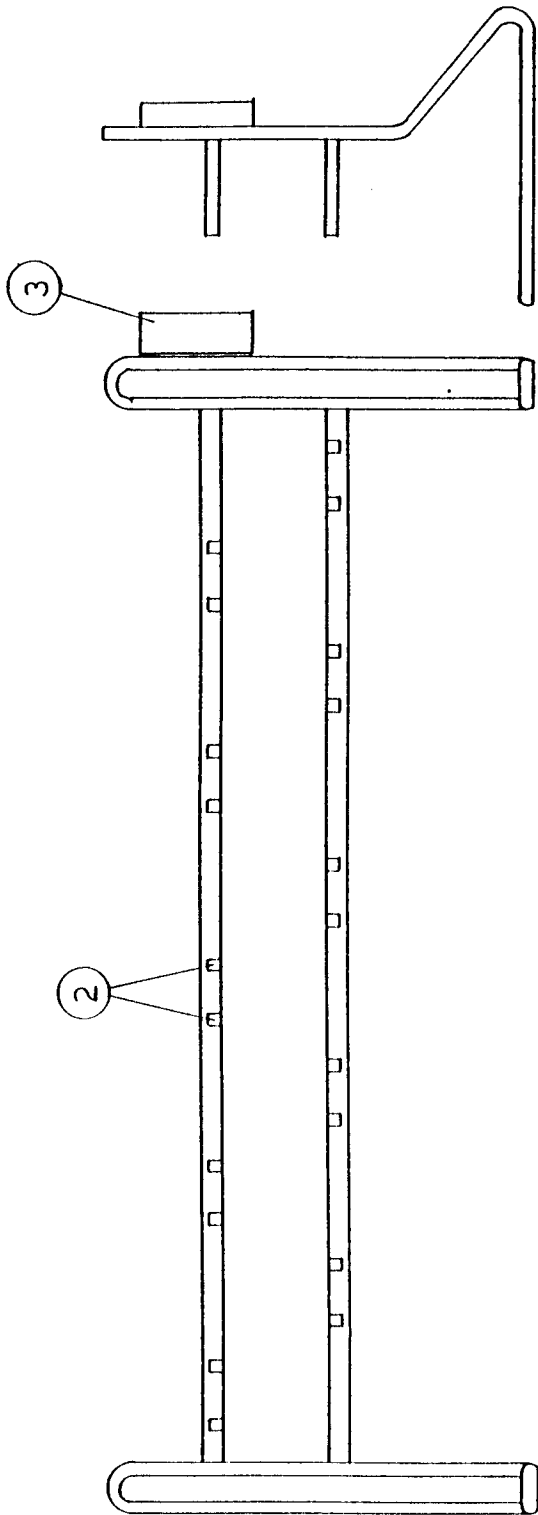


FIG 3

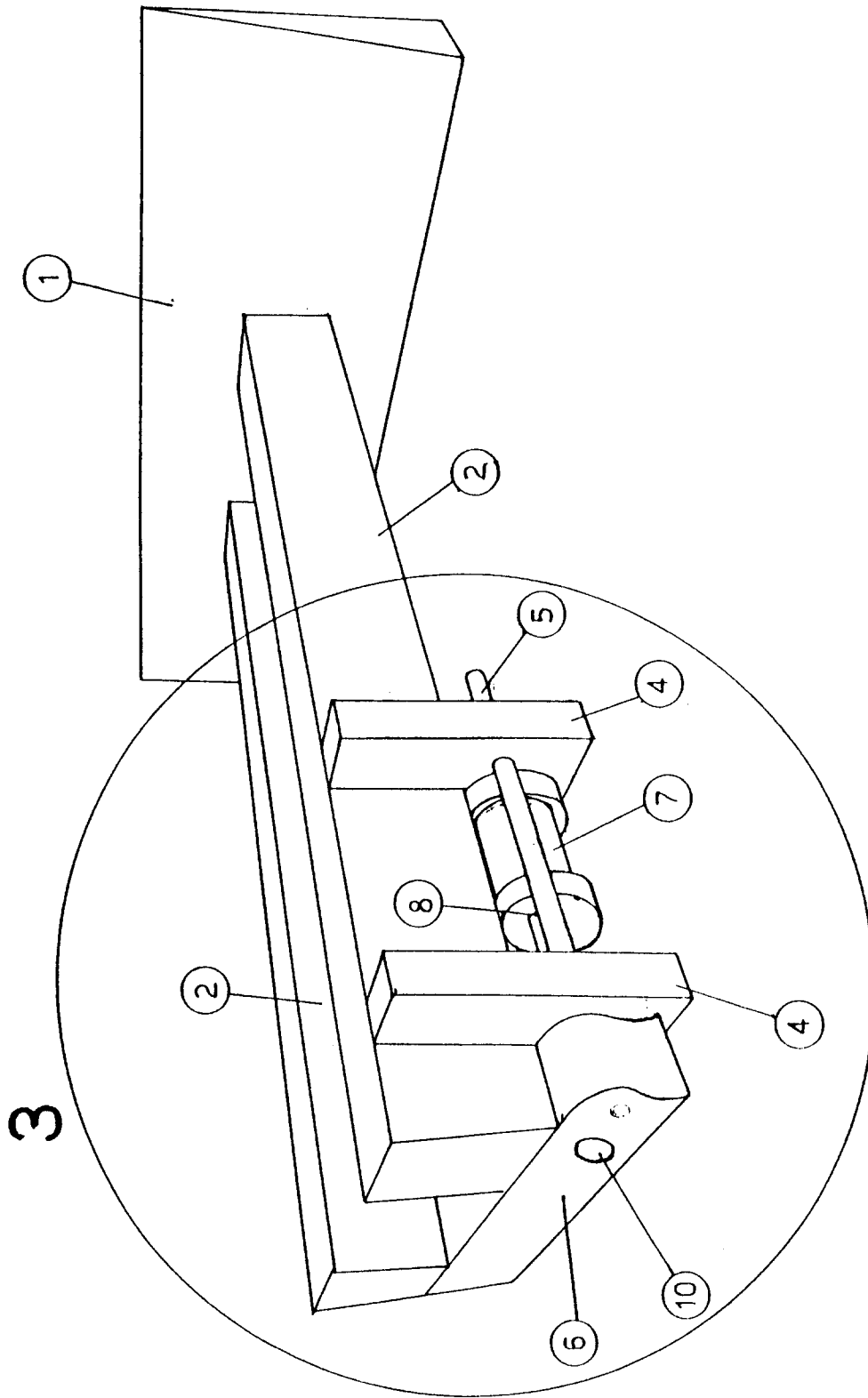


FIG 4

