The following statement is a full description of this invention, including the best method of performing it known to the inventor:

**IMPROVEMENTS IN AND RELATING TO CONTROL DEVICES FOR A REVOLVING STORAGE MECHANISM OF A MECHANISED STORAGE CABINET**
This invention relates to a control device for a motor-driven multiple carrier revolving storage mechanism of a mechanised storage cabinet.

Mechanised cabinets for storing of articles are already in use in modern offices to provide fast access to a desired document. Machines of this kind find also wide application in hospitals, libraries, banks, etc. In view of the possibility to gain fast access to the stored articles, such machines are also suitable for storing of goods in drug stores, retail stores, etc.

In a prior art storage mechanism the control device comprises means for recognising the position of the carriers with respect to the access opening of the filing or storage cabinet. In this device, the accuracy with which the carrier is located at the access opening depends on the accuracy of the positioning means. The carriers and the positioning means are driven by a chain drive. Therefore it is possible that the backlash in the chain has an unfavourable influence on the accuracy with which the carriers are located at the access opening. In order to increase accuracy it is already known to provide on each carrier an actuating member by which a microswitch connected into the circuit of the
motor is operated at the work station. However, as the carriers are suspended on chains, they can always swing to a certain degree, and therefore the microswitch is operated somewhat earlier or later, regardless of the vertical position of the carrier. Accordingly, from one movement to another substantial differences may occur in locating the carrier at the access opening. This is particularly undesirable when at the work station some containers have to be moved from the carrier to the work table or vice versa.

It is therefore an object of the present invention to provide a control device of which the actuating member causes actuation of the switch member to switch-off the motor of the storage device practically independently of the horizontal swing of the carrier.

According to the invention the improved control device comprises a selection device capable of receiving input signals to control the movement of carriers to an access opening of the filling cabinet, an U-like proximity switch mounted in said filling cabinet, and capable to control the switching-off of the motor, and an actuating member moving synchronously with each carrier and being capable to be moved without touching between arms of the U-like proximity switch with possible predetermined deviations in each direction transverse to its direction of travel, so as to actuate the proximity switch for interrupting.
of the motion of said carrier after its selection and its transport to said access opening.

An embodiment of the invention will now be explained with particular reference to the drawing. The drawing only serves for better representation and it shall not be inferred that it limits the scope of the invention.

Figure 1 shows a schematic representation of a mechanised filing cabinet.

Figure 2 shows a schematic representation of an U-like proximity switch, the actuating member being shown located in the slot of the proximity switch.

Figure 1 shows a customary mechanised cabinet on which carriers 1 are supported by means of levers 3 and 5 on an endless chain 7. Such levers 3 and 5 and a corresponding chain 7 are located on both sides of the carrier 1. Connected with the carrier 1 is a further lever 9, which at one end carries a roller 11 which can run in a guide rail 13 adapted to the orbit of the carriers. This guide rail 13 has preferably an U-like profile. The sprocket gear 16 can be driven by a motor not shown. The desired carrier can be positioned by a control device as it is for example described in the US-pagent 3 105 727.
As figure 2 shows, an actuating member 19, for example an angular member, is connected on the carrier 1. For this purpose, elongated holes 20 are preferably provided on the angular member, so that the angular member can be adjusted parallel to the direction 24 of the motion of the carrier 1 by means of screws 22, so as to permit an earlier or later switching-off of the motor. In this way, the stop position of every single carrier 1 can be controlled by adjusting the corresponding actuating member 19.

The U-like proximity switch 23 has two arms 25 and 26. It comprises further screw holes 72 for its mounting on the frame of the cabinet. The proximity switch can respond to the intruding of the actuating member 19 into the slot 28. It is practically of no importance, whether the actuating member 19 is closer to the left or to the right arm 25, 26, as this is indicated by arrows 31. It does practically also not matter on actuation of the proximity switch 23, whether the actuating member 19 extends somewhat deeper or less deep, seen transverse to the conveying direction, into the slot 28, as this is indicated by the arrows 33. This is of importance, because the carrier 1 can always swing within predetermined limits, which, if this would be of
influence on the switching point, would cause an im-
precise positioning.

Proximity switches responding to a sufficient approach
of an object, for instance of a metallic part, are
presently available in commerce as complete components.
Proximity switches usually operate by influencing an
electromagnetic oscillating circuit by sufficient appro-
ximation of an object to the proximity switch or by the
introduction of an object into the slot of an U-like
proximity switch. However, it would also be possible
to imagine an U-like proximity switch on which electro-
magnetic waves from an emitter are transmitted from one
arm of the U and received by a receiver on the other
arm, this causing the proximity switch to respond to
the introduction of an actuating member.

It is also not required that the actuating member 19 al-
ways consists of metal; it is only of importance that it
is made of a material to which the used proximity switch
can respond.

It will be appreciated that the described control device
assures that the switch and therefore the motor or the like
responds always very accurately to the vertical position
of the selected carrier. When the actuating member moves between the arms of the proximity switch, the proximity switch is always actuated at the same time, no matter whether the actuating member is somewhat closer to one arm or to the other arm, or whether it is, transverse to the direction of conveying, somewhat deeper or less deep in the slot between the arms. Accordingly, a swinging of the carrier, as long as it does not exceed predetermined limits, cannot have a disadvantageous influence on the switch-on point of the U-like proximity switch. Accordingly, the motor is always braked at the same time, so that an exact positioning of the carrier can take place.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:--

1. A control device for a motor-driven multiple carrier revolving storage mechanism of a mechanised storage cabinet, said control device comprising a selection device capable of receiving input signals to control the movement of carriers to an access opening of the filling cabinet, an U-like proximity switch mounted in said filling cabinet and capable to control the switching-off of the motor, and an actuating member moving synchronously with each carrier and being capable to be moved without touching between arms of the U-like proximity switch with possible predetermined deviations in each direction transverse to its direction of travel, so as to actuate the proximity switch for interrupting of the motion of said carrier after its selection and its transport to said access opening.

2. A control device as claimed in claim 1, wherein said actuating member consists of metal.

3. A control device as claimed in claims 1 or 2, wherein said actuating member consists of an angular piece and is adjustably connected to said carrier.
4. A control device as claimed in one of the claims 1 to 3 wherein said actuating member is provided with elongated holes for attachment to said carrier.

5. A control device as constructed and arranged to operate substantially as herein described with reference to and as illustrated in the drawing.

DATED this FOURTH day of SEPTEMBER, 1973

SPERRY RAND CORPORATION

Patent Attorneys for the Applicant SPRUSON & FERGUSON
Fig. 1