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(54) Title: ASSEMBLABLE CASING FOR BARRIER ARM SYSTEM

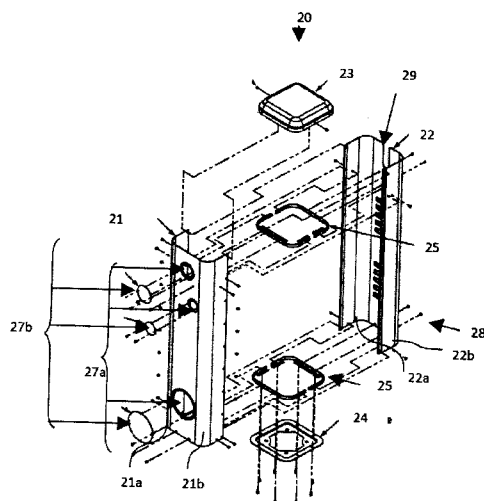


Fig.2

(57) Abstract: A barrier control system comprising a casing (20), a control module housed within the casing (20) and a barrier arm located externally on the casing (20) and operated by the control module characterized in that the casing (20) comprises at least two side members (21,22) cooperating to form a hollow body; a cap member (23) for closing the upper end of the casing (20); a base plate (24) for at least partially closing the lower end of the casing (20); and at least one bracket means (25) between the cap member (23) and the base plate (24) to support the control module in the casing (20).



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ASSEMBLABLE CASING FOR BARRIER ARM SYSTEM

FIELD OF INVENTION

- 5 The present invention relates to the field of the barrier arm systems for blocking pathways to restrict usages.

BACKGROUND OF THE INVENTION

- 10 A barrier system comprises many mechanical and electrical parts which require protection from elements such as rain and dust which may damage the system to render it not functionable. Hence, the barrier system is always protected by being fully housed in a casing. The casing must be rigid enough to support the weight of the barrier system with the barrier arm.

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- Conventionally, the casing is a rectangular shaped metal box being welded together on all sides. This causes an inconvenience because it is cumbersome to transport the bulky metal box to the site of installation. On top of it, the installation process is more complex as there are only limited entry point into the casing to contact the barrier
20 system for installation or maintenance.

- Disclosed is a U.S Patent No. US3975861 which relates to automated parking gate and control. The patent discloses the conventional casing which is wholly welded with just an entrance door. So any authorized personnel needs to check the barrier
25 system, they have to do it through that small entrance door.

- It is therefore the intention of this present invention to offer a device that will be able to be transported and assembled conveniently and also eases the work of maintaining the barrier system housed within the casing.

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SUMMARY OF INVENTION

The assemblable casing proposed herein can be assembled around the control system when required and disassembled for transport or storage or for servicing/replacement
5 of the control system. Transportation of the conventional casing as a whole unit to the site of installation of the barrier arm system is more difficult. Besides taking out and putting in the control system inside it through a door also is generally inconvenient.

At least one of the preceding objects is met, in whole or in part, by the present
10 invention, in which one of the embodiments of the present invention describes a barrier control system comprising a casing, a control module housed within the casing and a barrier arm located externally on the casing and operated by the control module characterized in that the casing which comprises at least two side members cooperating to form a hollow body, a cap member for closing the upper end of the
15 casing, a base plate for at least partially closing the lower end of the casing and at least one bracket means located between the cap member and the base plate to support the control module in the casing. The casing is of any shape such as cylindrical, cubic, cuboid, hexagonal, oval and the like.

20 According to a preferred embodiment, one of the side members of the casing having at least one aperture for easy accessing of the control module without having to disassemble the casing. Also the other side member has an opening for coupling the barrier arm with the control module in the casing. There is a cover for closing the aperture to prevent undesirable matter to be in contact with the control module inside
25 the casing. There are also at least two sealing means to secure the connection of the cap member and the base plate to the casing.

The present invention consists of certain novel features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings and
30 particularly pointed out in the appended claims; it being understood that various

changes in the details may be possible without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

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In the following drawings, same reference numbers generally refer to the same parts throughout. The drawings are not necessarily to scale, instead emphasis is placed upon illustrating the principles of the invention. The various embodiments and advantages of the present invention will be more fully understood when considered with respect to the following detailed description, appended claims and accompanying drawings wherein:

Fig. 1 illustrates a perspective view of a barrier arm system in the prior art.

15 Fig.2 illustrates an embodiment of the invention, where the casing for housing the control system in a barrier arm system is disassembled into a plurality of sections.

DETAILED DESCRIPTION OF THE INVENTION

20 The following description presents several preferred embodiments of the present invention in sufficient detail such that those skilled in the art can make and use the invention.

Before describing in detail embodiments that are in accordance with the present invention, it should be noted that all of the figures are drawn for ease of explanation of the basic teachings of the present invention only. The extension of the figures with respect to the number, position, relationship and dimension of the parts of the preferred embodiment will be within the skill of the art after the following teachings of the present invention have been read and understood. Further, the exact dimensions and dimensional proportions to conform to specific force, weight, strength and similar

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requirements will likewise be within the skill of the art after the following teachings of the present invention have been read and understood.

Fig. 1 illustrates a typical barrier arm system (10), where a casing (8) contains a control system that is connected to a barrier arm (2) at a joint (4). The control system typically includes a motor that can be controlled to move in either direction. The motor fitted with other accessories can be commanded to raise the arm for opening the barrier to the pathway or can be commanded to lower the arm for being horizontal and being a barrier to the pathway. A spindle from the motor passes out of the casing (8) through an aperture, for connecting to the barrier arm (2) at the joint (4). The control system may also be manually operable with a handle and a lever system. The size of the casing (8) is generally quite big for holding the control system and the casing (8) is quite heavy for stability and strength for housing the control system. The casing (8) is provided with a flat bottom for resting on a level surface, such as the ground. The door (7) is provided for accessing the control system, such as for adjustments, maintenance, servicing or replacement.

The casing being quite heavy and of a big size, is often inconvenient for storage and transportation. It is also often inconvenient to take in and take out the control system into and from the casing respectively, through the door (7), as generally the control system is also quite heavy. The conventional casings have the sides already assembled/welded together.

Fig.2 illustrates the casing (20) in disassembled condition, for housing a control module (not shown) for a barrier arm (not shown) in a barrier arm system, according to an embodiment of the invention. The barrier control system comprising a casing (20), a control module housed within the casing (20) and a barrier arm located externally on the casing (20) and operated by the control module. The casing (20) comprises at least two side members (21,22) cooperating to form a hollow body, a cap member (23) for closing the upper end of the casing (20), a base plate (24) for at least

partially closing the lower end of the casing (20), and at least one bracket means (25) between the cap member (23) and the base plate (24) to support the control module in the casing (20).

- 5 The casing (20) can be disassembled for transport/storage or for taking the control system in and out such as for servicing or replacement. Conventional casings provide doors for taking in or taking out the control system, which is not too convenient as typical control systems are quite bulky.
- 10 The casing (20) may be of any shape such as cylindrical, cubic, cuboid, hexagonal, oval and the like, with the bottom surface being preferably flat for resting the casing (20) on a surface such as the ground, while using the barrier arm system. The shape is not crucial, as long as it can house the control system. However, the number of the sections may be optimized between convenience of handling for transport / storage
- 15 and assembling time/effort. Higher the number of sections, more is the time and effort required for assembly and disassembly, though storage and handling smaller sections may be easier.

One of the side members (21) having at least one aperture (27a) for easy accessing of

20 the control module without having to disassemble the casing (20). For example, during usage of the barrier arm system, sometimes it is required to access a limit switch (not shown) in the control module for controlling the operational angle of the barrier arm, such as the horizontal and vertical angles of the barrier arm, as it moves up and down. So the aperture (27a) would allow the limit switch to be adjusted by a

25 screw driver from outside the casing (20) without having to disassemble the whole casing (20). Another example is to access the release mechanism (not shown) for allowing a manual movement of the barrier arm in case the motor in the control system is spoilt or when there is a power failure. The release mechanism can then be accessed from outside the casing (20) to tighten/loosen a lever connected to the

30 release mechanism to allow the barrier arm to be manually controlled. The aperture

(27a) should not be in the bottom surface, for obvious reasons.

The other side member (22) has an opening (29) for coupling the barrier arm with the control module in the casing (20). For obvious reasons, the opening (29) also cannot be in the bottom surface.

5

At least a part of the members can be assembled by fasteners, such as nuts and bolts (28), this being one of the most common methods in the art. At least a part of the members can be assembled by male-female type interlocking mechanism in the art., which further simplifies the assembly/disassembly as then there is no need for dealing
10 with loose items such as nuts and bolts. It is time and effort saving too, as with an interlocking system two sections can be joined by sliding type or press-fit type mechanisms.

According to an embodiment as in Fig.2 the members of the casing (20) may
15 comprise a side member (21) forming a first (21a) and a second (21b) right angles, the other side member (22) forming a third (22a) and a fourth (22b) right angles, a base plate (24) for forming the bottom surface and a cap member (23), such that all these sections can be assembled together at their edges for housing the control system. This arrangement is an example of having a few members, so that it is not too tedious
20 to assemble/disassemble, at the same time the members are convenient for handling. The side members (21, 22) help reduce the number of joints. However, other ways of configuring the shapes, sizes and numbers of sections may be adopted, keeping in mind that the material of the casing needs to be strong enough for supporting the weight of the control system.

25

A removable cover (27b) for the aperture (27a) may be provided, so that the cover can be removed only while accessing the control module or the interior of the casing. This is helpful for safety reasons, as well as for preventing unwanted matter such as rain
water from reaching the control module.

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The casing (20) may further comprises at least one bracket means (25) that can be assembled on the inner side of the casing (20) between the cap member (23) and the base plate (24) to support the control module in the casing (20) so that the control module remains rigidly fixed relative to the casing (20). The bracket means (25) may
5 be in one piece or in a plurality of pieces, as per convenience. The assembling for the bracket means (25) onto the interior of the casing (20) and disassembling therefrom may be again by means of nuts and bolts or interlocking mechanisms or otherwise.

A method of using the barrier control system comprising a casing (20) comprises the
10 steps of assembling the plurality of members together to form the complete casing (20) for housing the control module while coupling the control module with the barrier arm through the opening (29) and disassembling the plurality of sections apart, for transport/storage. The step of assembling/disassembling is at least partially by fasteners, such as by nuts and bolts (28), when provided. The step of
15 assembling/disassembling is at least partially by interlocking mechanism, when provided. When the at least one bracket is provided, the method further comprises the steps of assembling the at least one bracket means (25) on the inner side of the sections before assembling the plurality of the sections and supporting the control module inside the casing (20) by the bracket means (25), so that the control module
20 remains rigidly fixed relative to the casing (20). In case of the embodiment at Fig.2, the bracket means (25) may be in two pieces such that either piece can be assembled onto the inner side members (21,22), and then the two members can be assembled together supporting the control module by the two piece bracket means (25). A plurality of bracket means (25) may be used for providing extra and more uniform
25 support to the control module. The material and structure of the bracket means (25) need to be suitable for supporting the weight of the control module.

While the foregoing description presents preferred embodiments of the present invention along with many details set forth for purpose of illustration, it will be
30 understood by those skilled in the art that many variations or modifications in details

of design, construction and operation may be made without departing from the present invention as defined in the claims. The scope of the invention is as indicated by the appended claims and all changes that come within the meaning and range of equivalency of the claims are intended to be embraced therein.

CLAIMS

1. A barrier control system comprising a casing (20), a control module housed within the casing (20) and a barrier arm located externally on the casing (20) and operated by the control module characterized in that the casing (20) comprises at least two side members (21,22) cooperating to form a hollow body;
a cap member (23) for closing the upper end of the casing (20);
a base plate (24) for at least partially closing the lower end of the casing (20);
and
at least one bracket means (25) between the cap member (23) and the base plate (24) to support the control module in the casing (20).
2. A barrier control system according to claim 1, wherein one of the side members (21) has at least one aperture (27a) for easy accessing of the control module without having to disassemble the casing (20).
3. A barrier control system according to claim 1 or claim 2, wherein the other side member (22) has an opening (29) for coupling the barrier arm with the control module in the casing (20).
4. A barrier control system according to any of claim 1 to 3 further comprising a cover (27b) for the aperture (27a).
5. A barrier control system according to any of claim 1 to 4 having sealing means to seal the connections between the cap member (23) and the base plate (24) with the casing.

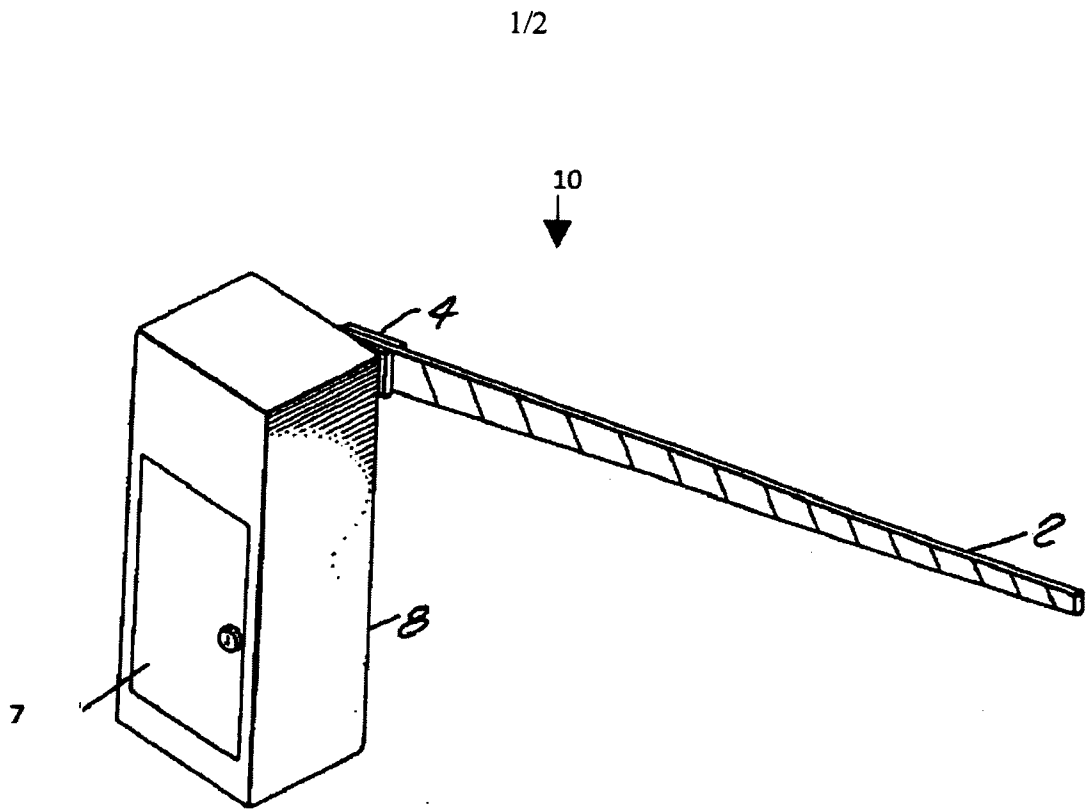


Fig.1

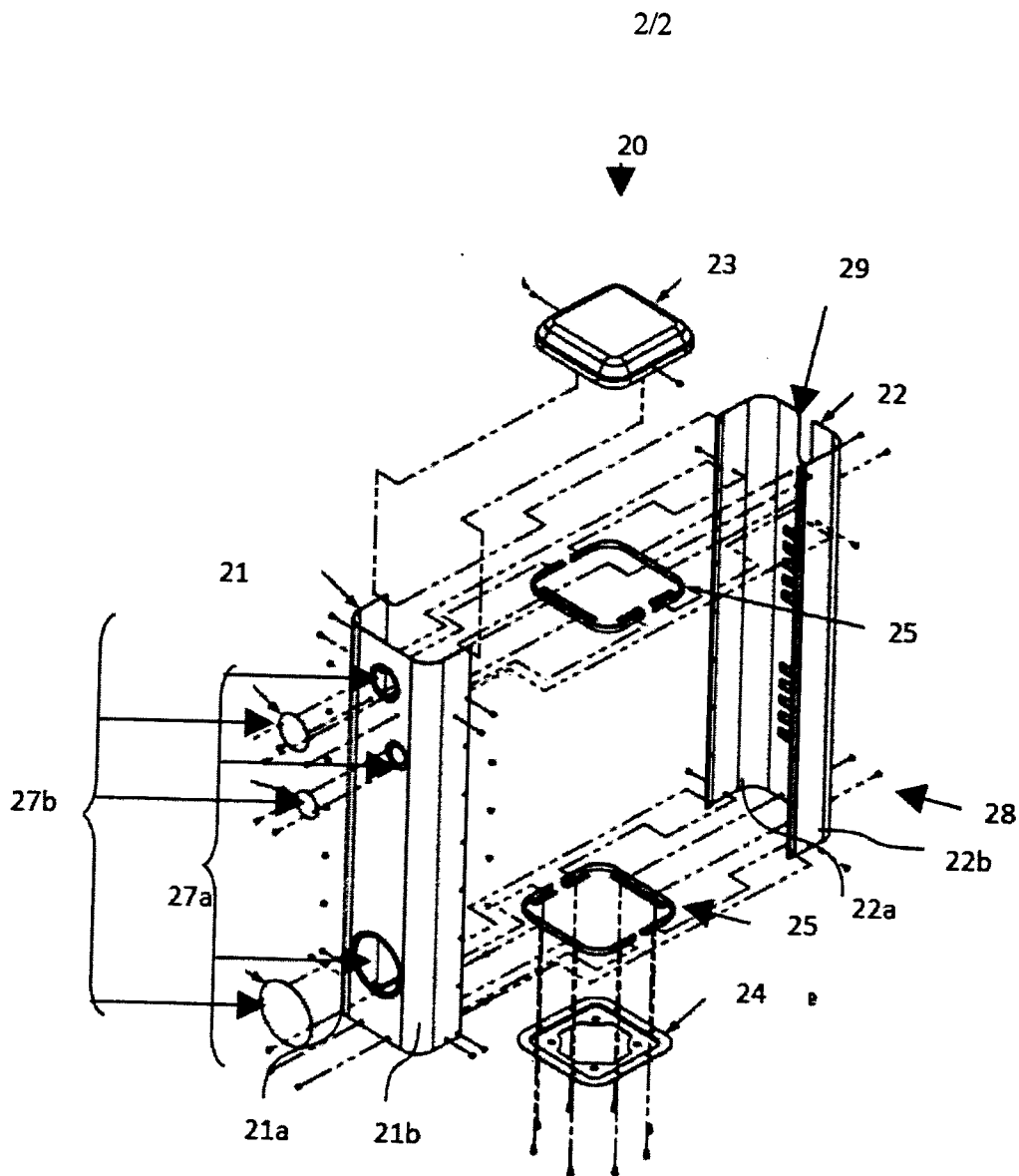


Fig.2