

Title : **ASSIST APPARATUS FOR INLET-OUTLET GATE**

BACKGROUND OF THE INVENTION

(1) FIELD OF THE INVENTION

5 The invention relates to an assist apparatus for an inlet-outlet gate, and more particularly to an assist apparatus for an inlet-outlet gate capable of increasing an open area of a door block so that the size of the casing can be reduced, the problem of the notch caused when the size of the casing is reduced may be solved, and the security problem induced thereby may be
10 solved.

(2) DESCRIPTION OF THE PRIOR ART

FIG. 1 is a schematic illustration showing a conventional inlet-outlet gate 20. The inlet-outlet gate 20 is mainly disposed in the inlet-outlet passageway of the building or the inlet-outlet passageway inside the house to control the
15 access and the egress of persons. The inlet-outlet gate 20 is mainly composed of a casing 21, a door block 22 and a control driving unit 23. As shown in the drawing, it is obtained that the following drawbacks still exist although the control of the access and the egress of persons can be achieved by the inlet-outlet gate 20.

20 First, the inlet-outlet gate 20 is disposed on the limited passageway of the limited building, the passageway has the limited space, and the casing 21 of the gate occupies a large portion of the space. Thus, the space of the gate is often reduced, or the number of gates has to be limited. Also, it is very troublesome in configuring the inlet-outlet gates 20. So, the prior art problem
25 has to be solved.

Second, as shown in FIG. 2, if the casing 21 of the gate is directly reduced to overcome the above-mentioned problem. The door block 22 also has to be inevitably reduced at the same time so that the casing 21 can accommodate the door block 22. However, if the door block 22 is reduced, a notch 24 tends to be formed between the door block 22 and the casing 21 when the door block 22 is opened. In this case, the persons passing through the gate tend to be touched and hurt or jammed, and the security problem is thus induced. Thus, it is an important subject to effectively eliminate the security problem induced by the notch, and to reduce the size of the casing.

In view of the associated problems induced by the design defects of the prior art, the present inventor has paid attention to the research and development according to the experience and the technology in manufacturing the associated products for many years, and thus developed this assist apparatus for the inlet-outlet gate to have the wider application range and the higher industry utility.

SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide an assist apparatus for an inlet-outlet gate such that an open area of a door block can be enlarged, and a notch and a security problem induced when a size of a casing is reduced can be eliminated and the size of the casing can be thus reduced.

The invention achieves the above-identified object by providing an assist apparatus to be disposed on an opening of a casing of an inlet-outlet gate. A door block and a control driving unit are disposed inside the casing. The assist apparatus includes a sheath, a fixing unit, and an elastic member. The sheath is movably disposed at one end of the opening and has a fitting portion

corresponding to and fitting with an end edge of the door block. A pivot portion and an elastic member connecting portion are provided on each of two sides of the sheath. The fixing unit is disposed inside the casing and above the sheath and neighbors on the sheath. A hook portion is formed on a free end thereof.

5 The elastic member is disposed between the sheath and the fixing unit, and has one end connected to the elastic member connecting portion and the other end connected to the hook portion to provide a restoring force to restore the sheath to its original position. Thus, the assist apparatus of the invention can push out the sheath to enlarge the open area when the door block is opened, and a
10 notch formed between the door block and the casing and a security problem induced when a size of the casing is reduced can be eliminated such that the size of the casing can be reduced.

Further aspects, objects, and desirable features of the invention will be better understood from the detailed description and drawings that
15 follow in which various embodiments of the disclosed invention are illustrated by way of examples.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic illustration showing a conventional inlet-outlet gate.

FIG. 2 is a schematic illustration showing the conventional inlet-outlet gate
20 applied to a casing whose size is reduced.

FIG. 3 is a pictorial view showing an inlet-outlet gate and an assist apparatus according to the invention.

FIG. 4 is a pictorial view showing a sheath of the invention.

FIG. 5 is a schematic side view showing the combination of the inlet-outlet
25 gate and the assist apparatus of the invention.

FIG. 6A is a schematic illustration showing a first operation of the inlet-outlet gate and the assist apparatus of the invention.

FIG. 6B is a schematic illustration showing a second operation of the inlet-outlet gate and the assist apparatus of the invention.

5 FIG. 6C is a schematic illustration showing a third operation of the inlet-outlet gate and the assist apparatus of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention will become apparent from the following detailed description of the preferred but non-limiting embodiments. The following description is
10 made with reference to the accompanying drawings.

FIG. 3 is a pictorial view showing an inlet-outlet gate 20 and an assist apparatus 10 according to the invention. FIG. 4 is a pictorial view showing a sheath of the invention. FIG. 5 is a schematic side view showing the combination of the inlet-outlet gate and the assist apparatus of the invention.
15 Referring to FIGS. 3 to 5, the assist apparatus 10 is applied to the inlet-outlet gate 20, which has a casing 21 formed with an opening 211, and a door block 22 and a control driving unit 23 disposed inside the casing 21. The assist apparatus 10 increases an open area of the inlet-outlet gate 20 so that the size of the casing 21 can be reduced, and the problem of a notch 24 (see FIG. 2)
20 and the security problem induced when the size of the casing 21 is reduced can be solved. The assist apparatus 10 includes a sheath 11, a fixing unit 12 and two linking-up elastic members 13.

The sheath 11 is movably disposed at one end of the opening 211, and has a corresponding fitting portion 111 fitting with an end edge of the door block
25 22. A pivot portion 112 and an elastic member connecting portion 113 are

provided on each of two sides of the sheath 11.

The fixing unit 12 is disposed inside the casing 21 and above the sheath 11, neighbors on the sheath 11, and is formed with a hook portion 121 at a free end thereof.

5 The two linking-up elastic members 13 are disposed between the sheath 11 and the fixing unit 12, and each of the elastic members 13 has one end connected to the elastic member connecting portion 113 and the other end connected to the hook portion 121 to provide a restoring force to restore the sheath 11 to the original position. Thus, when the door block 22 extends out of
10 the casing 21, the sheath 11 may be pushed out to enlarge the open area. Thus, the notch formed between the door block 22 and the casing 21 and the security problem induced thereby may be eliminated, and the size of the casing 21 may be thus reduced.

Each of the pivot portions 112 disposed on the two sides of the sheath 11
15 in this embodiment is a pivot hole, a rotating shaft 212 is disposed on a periphery of the opening 211, and the position of the pivot hole corresponds to that of the rotating shaft 212. Thus, the rotating shaft 212 is pivotally connected to the rotating shaft 212 so that the sheath 11 may be rotated about the opening 211. Thus, the above-mentioned structure constitutes a novel
20 assist apparatus 10 for the inlet-outlet gate.

As mentioned hereinabove, the fitting portion 111 is a slot in this embodiment to fit with the end edge of the door block 22. In this embodiment, the elastic member connecting portion 113 is a projecting rod to be hooked by the linking-up elastic member 13.

25 FIGS. 6A to 6C are schematic illustrations showing operations of the assist

apparatus for the inlet-outlet gate of the invention. As shown in the drawing, when the door block 22 is opened, the control driving unit 23 firstly rotates the door block 22 so that the door block 22 gradually extends out of the casing 21. At this time, the end edge of the door block 22 is fit with the fitting portion 111 of the sheath 11 so that the sheath 11 naturally gradually extends out of the casing 21. When the door block 22 is completely opened, the sheath 11 is also completely pushed out of the casing 21 (see FIG. 6C) by the door block 22. Thus, the open area of the door block 22 may be enlarged, and the notch 24 formed between the door block 22 and the casing 21 and the security problem induced thereby may be eliminated so that the size of the casing 21 may be reduced. On the contrary, when the door block 22 is closed, the control driving unit 23 rotates the door block 22 so that the door block 22 is gradually retracted into the casing 21. At this time, the door block 22 does not push the sheath 11 any more. Therefore, the sheath 11 is influenced by the restoring force provided by the linking-up elastic member 13 so that the sheath 11 gradually restores to the original position, and the gate can be finally closed.

As mentioned hereinabove, it is concluded that the structure design of the assist apparatus 10 for the inlet-outlet gate of the invention has the following advantages.

First, when the sheath 11 of the invention is opened, the open area of the door block 22 may be increased.

Second, when the sheath 11 of the invention is closed, the notch 24 formed between the door block 22 and the casing 21 and the security problem caused by the size reduction of the casing can be eliminated so that the size of the casing 21 can be reduced.

In summary, the assist apparatus for the inlet-outlet gate of the invention can obviously increase the open area of the door block, and eliminate the problem of the notch formed between the door block and the casing and the security problem induced when the size of the casing is reduced. Thus, the
5 size of the casing can be reduced, and the assist apparatus accordingly has the utility and the economic value.

New characteristics and advantages of the invention covered by this document have been set forth in the foregoing description. It is to be expressly understood, however, that the drawings are for the purpose of
10 illustration only and are not intended as a definition of the limits of the invention. Changes in methods, shapes, structures or devices may be made in details without exceeding the scope of the invention by those who are skilled in the art. The scope of the invention is, of course, defined in the language in which the appended claims are expressed.

WHAT IS CLAIMED IS:

1. An assist apparatus for an inlet-outlet gate, the assist apparatus being disposed in an opening of a casing of the inlet-outlet gate, a door block and a control driving unit being disposed inside the casing, the assist apparatus comprising:

a sheath, movably disposed at one end of the opening and having a fitting portion corresponding to and fitting with an end edge of the door block, wherein a pivot portion and an elastic member connecting portion are provided on each of two dies of the sheath;

a fixing unit disposed inside the casing and above the sheath and neighboring on the sheath, wherein a hook portion is formed at a free end of the fixing unit; and

at least one linking-up elastic member disposed between the sheath and the fixing unit, and having one end connected to the elastic member connecting portion and the other end connected to the hook portion to provide a restoring force to restore the sheath to an original position so that the sheath can be pushed out to enlarge an open area when the door block is opened and a notch formed between the door block and the casing and a security problem induced when a size of the casing is reduced can be eliminated such that the size of the casing can be reduced.

2. The assist apparatus according to claim 1, wherein the pivot portion is a pivot hole, a rotating shaft is disposed on a periphery of the opening, and a position of the pivot hole corresponds to a position of the rotating shaft so that the rotating shaft is pivotally connected to the pivot hole and the sheath may be rotated in the opening.

3. The assist apparatus according to claim 1, wherein the fitting portion is a slot.
4. The assist apparatus according to claim 1, wherein the elastic member connecting portion is a projecting rod.