CLAIMS

1. A horseshoe-shaped lock (30) with a substantially C-shaped lock opening, characterized in comprising:

a lock pin (3073B) provided with a retaining groove and configured to realize unlocking or locking through movement of the lock pin;

a first force application member (3073A) for the lock pin;

a tongue (3071) configured to be able to enter the retaining groove to stop the movement of the lock pin or move out of the retaining groove to release the lock pin to allow the lock pin to move, a driving hole being formed in the tongue and arranged with a stopper;

a second force application member (3078) for the tongue; and

a tongue driving member (3074) configured to convert a rotational driving force of the motor into a driving force allowing the tongue to move out of the retaining groove, one end of the tongue driving member being connected to an output shaft of a motor in such a way that the tongue driving member is rotated with the motor, and another end of the tongue driving member being formed as a projection in such a way that when tongue driving member is rotated, the projection is rotated along a circular trace taking an eccentric distance as a radius thereof;

wherein the projection extends into the driving hole and is configured to rotate against the stopper so as to drive the tongue to move in a direction of moving out of the retaining groove, and

when the projection continues to rotate and then goes beyond the stopper, the tongue loses a force allowing the tongue to move out of the retaining groove.

2. The horsehoe-shaped lock of claim 1, characterized in that the first force application member (3073A) is configured to exert, on the lock pin, a force allowing the lock pin to move in an unlocking direction.

3. The horsehoe-shaped lock of claim 1, characterized in that the second force application member (3078) is configured to exert, on the tongue, a force allowing the tongue

to move in a direction of entering the retaining groove.

4. The horsehoe-shaped lock of claim 1, characterized in comprising: a motor assembly including a motor (3077), a sealing gasket (3076) mounted at an output shaft side of the motor, and a motor box (3075) for accommodating the motor and the sealing gasket therein.

5. The horsehoe-shaped lock of claim 1, characterized in that the driving hole is formed in a shape through which unlocking and locking processes are realized.

6. The horsehoe-shaped lock of claim 1, characterized in that the driving hole is b-shaped.

7. The horsehoe-shaped lock of claim 2, characterized in that the first force application member is a tension spring, one end of the tension spring is fixed in a lock groove, and the other end thereof is connected to a non-lock opening end of the lock pin.

8. The horsehoe-shaped lock of claim 1, characterized in comprising: a location sensor (3072) configured to detect the location of the tongue.

9. The horsehoe-shaped lock of claim 8, characterized in that the location sensor comprises a first limit switch and a second limit switch; a first limit piece and a second limit piece are, respectively, arranged at two sides of the tongue; the first limit switch corresponds to the first limit piece in position; the second limit switch corresponds to the second limit piece in position; when the tongue enters the retaining groove, the first limit piece triggers the first limit switch; and when the tongue moves out of the retaining groove and moves to the maximum movement distance point, the second limit piece triggers the second limit switch.

10. The horsehoe-shaped lock of claim 1, characterized in comprising a case (309), wherein the case comprises a lock body portion and side arm portions extending from left and right sides of the lock body portion, respectively, to form a C-shaped lock opening; the

tongue and the tongue driving member are accommodated in the case; a C-shaped lock groove is formed inside the side arm portion; and the lock pin is annular, and is capable of moving in the lock groove.