the cam piece into the locking position, whereby it holds the latch parts against the counter holes in the shackle. The latch parts are normally balls.

In electronic padlocks like the one described above, the turning of the cam piece can be limited only by internal friction in the electronic actuator or its gearing. Thus, it can also be possible that by knocking on the electronic padlock, the cam piece can be made to erroneously turn, whereby the electronic padlock is no longer locked and it can be opened.

WO 2018184070 presents one implementation of an electronic padlock, where a coil spring affects the turning of the cam piece. In this solution, the coil spring strives to hold the cam piece in the locking position. In the solution of the WO publication, there is a blocking piece and a turning knob in connection with the electronic actuator. When the blocking piece is released from the blocking position with the aid of the electronic actuator, the turning knob can be turned manually in order to turn the cam piece and open the electronic padlock. Thus, in this solution, the cam piece is turned manually against the coil spring in order to open the lock.

WO 2017/097186 an electronic padlock with a blocking mechanism having a solenoid. WO 2019/119631 discloses an electronic padlock with a blocking mechanism having a plate with cavity. CN 205 531 813 discloses also an electronic padlock having a clutch mechanism.

Brief description of the invention

Embodiments of the invention provide an electronic padlock, which reduces the possibility of erroneous opening of the electronic padlock or even eliminates the possibility of erroneous opening.

The electronic padlock according to an aspect of the invention comprises a body and a shackle. The body has latch parts, a cam piece and an electronic actuator. The electronic actuator comprises a pivot shaft, which is arranged to turn the cam piece to release the latch parts from a locking state, and also to turn the cam piece to hold the latch parts in the locking state. In the locking state, the latch parts prevent the shackle from being moved to open the electronic padlock. Between the electronic actuator and the cam piece there is a blocking mechanism in the direction of the pivot shaft of the electronic actuator. The blocking mechanism connects the pivot shaft of the electronic actuator functionally to the cam piece to turn it with the electronic actuator and prevent any other turning of the cam piece in relation to the body.

The blocking mechanism comprises a locking plate, a latch piece and a driver. The locking plate is connected to the pivot shaft of the electronic actuator. The locking plate has a peripheral edge, which has a release recess. The locking plate is also arranged to be turned in relation to the driver. The driver has a torsion projection, which is connected to the cam piece. The driver also has a hole, in which the latch piece is placed, and the body has a recess for the latch piece.

The blocking mechanism is arranged to prevent turning of the cam piece, when the latch piece is partly in the recess and partly in the driver hole, and the peripheral edge of the locking plate prevents the latch piece from moving toward the pivot shaft. The blocking mechanism is also arranged to allow turning of said cam piece, when the electronic actuator has by turning the pivot shaft turned the release recess of the locking plate to the driver hole, allowing the latch piece to move toward the pivot shaft. The peripheral edge of the locking plate has protrusions away from the pivot shaft for transmitting torque from the locking plate to the driver. Still continuing the turning of the pivot shaft with the electronic actuator, in addition to the locking plate, the driver and the thereto connected cam piece also turn.

The blocking mechanism additionally comprises a spring, which is supported on the driver and which spring has a spring head. The locking plate comprises a hole for the spring head. The spring head is in the hole, when the latch piece is partly in the recess and partly in the driver hole, and the peripheral edge of the locking plate prevents the latch piece from moving toward the pivot shaft.

List of figures

In the following, the invention will be described in more detail with reference to the appended figures, in which

Figure 1 shows an example of an electronic padlock according to the invention,

Claims

1. An electronic padlock, which comprises a body (2) and a shackle (3), which body has latch parts (4), a cam piece (5) and an electronic actuator (6), which electronic actuator comprises a pivot shaft (7), which pivot shaft is arranged to turn the cam piece (5) to release the latch parts (4) from a locking state and to turn the cam piece (5) to hold the latch parts (4) in the locking state, in which locking state the latch parts (4) prevent the shackle (3) from being moved to open the electronic padlock, **characterized** in that between the electronic actuator (6) and cam piece (5) there is a blocking mechanism (8) in the direction of the pivot shaft (7) of the electronic actuator, which blocking mechanism (8) connects the pivot shaft (7) of the electronic actuator functionally to the cam piece (5) to turn it with the electronic actuator (6) and prevent any other turning of the cam piece (5) in relation to the body (2),

which blocking mechanism (8) comprises a locking plate (9), a latch piece (10) and a driver (11), which locking plate (9) is connected to the pivot shaft (7) of the electronic actuator, which locking plate has a peripheral edge (13), which has a release recess (12) and which locking plate (9) is arranged to be turned in relation to the driver (11),

which driver has a torsion projection (14), which is connected to the cam piece (5), and which driver (11) has a hole (15), in which the latch piece (10) is placed, and the body (2) has a recess (16) for the latch piece (10),

which blocking mechanism (8) is arranged to prevent turning of the cam piece (5), when the latch piece (10) is partly in the recess (16) and partly in the driver hole (15), and the peripheral edge (13) of the locking plate (9) prevents the latch piece (10) from moving toward the pivot shaft (7), and which blocking mechanism (8) is arranged to allow turning of said cam piece (5), when the electronic actuator (6) has by turning the pivot shaft (7) turned the release recess (12) of the locking plate (9) to the driver hole (15), allowing the latch piece (10) to move toward the pivot shaft (7), whereby the peripheral edge (13) of the locking plate has protrusions (20) away from the pivot shaft (7) for transmitting torque from the locking plate (9) to the driver (11) whereby still continuing the turning of the pivot shaft (7) with the electronic actuator (6), in addition to the locking plate (9), the driver (11) and the thereto connected cam piece (5) also turn,

the blocking mechanism (8) further comprising a spring (17), which is supported on the driver (11) and which spring has a spring head (18), and which locking plate (9) comprises a hole (19) for the spring head (18), which spring head (18) is in the hole, when the latch piece (10) is partly in the recess (16) and partly in the driver hole (15), and the peripheral edge (13) of the locking plate prevents the latch piece (10) from moving toward the pivot shaft (7).

2. Electronic padlock according to claim 1, **characterized** in that the latch piece (10) is a ball or a roller, the length and width of which roller are the same or almost the same.

3. The electronic padlock according to claim 1 or 2, **characterized** in that the peripheral edge (13) of the locking plate has protrusions (20) away from the pivot shaft (7).

4. The electronic padlock according to claim 2 or 3, **characterized** in that the driver (11) has support surfaces (21) for the spring (17).

5. The electronic padlock according to claim 4, **characterized** in that the driver has installation protrusions (22, 23) for the locking plate (9).

6. The electronic padlock according to any of the claims 1 - 5, **characterized** in that there is a hole (24) for the pivot shaft in the centre of the locking plate (9).

7. The electronic padlock according to any of the claims 1 - 6, **characterized** in that the electronic actuator (6) is an electric motor or a solenoid.