

SWITCH LOCK

The present invention relates to a switch lock, in particular for an espagnolette lock on a door leaf or the like, comprising a strike plate having a passage opening for a drive bolt which is spring-loaded in the direction of the extended locked position of the drive bolt, a lock housing which is connected to the strike plate, a clamping plate which is accommodated in the lock housing in a spring-loaded manner, a clamping lug of which surrounds the drive bolt, and via which the drive bolt can be blocked in any retracted position, and a spring-loaded latch that can be moved in the lock housing passes through the strike plate, and can be pushed into the lock housing against the spring force in order to pivot the clamping plate into a release position in which the drive bolt is released.

Drive bolt latches of the type mentioned at the outset are known from EP 0 348 971 B1 and CH 697 988 B1, among others. They are usually installed in the stationary leaf of double-leaf doors in order to ensure that the spring-loaded drive bolt is retained in its unlocked position when the leaf is opened and said drive bolt is only extended into its locked position after the stationary leaf has reached its closed position. The drive bolt engages in the process with its outer end into the latch hole of a door strike present on the fixed door frame that also functions simultaneously as a stop for the latch. Due to the clamping plate accommodated in the lock housing, the drive bolt may be blocked, not only in its completely retracted position, but also in any other retracted position. By this means, circumstances are taken into account in which the drive bolt shafts do not necessarily need to be completely retracted, e.g., in the case of a large door rebate clearance.

In double-leaf door systems, the stationary leaf is usually bolted using an espagnolette in the floor and in the frame. The espagnolette may, for example, be relatively easily manipulated through the upper door gap by prying it out. Until now, the risk of burglary is therefore relatively high for conventional switch locks of the type listed at the outset.

The aim of the invention is to provide a switch lock of the type mentioned at the outset that guarantees high protection against burglary using a structure that is as simple as possible..

This aim is achieved according to the invention by a switch lock comprising the features of claim 1. Preferred embodiments of the switch lock according to the invention result from the dependent claims, the present description, and the drawing.

The switch lock according to the invention, provided in particular for an espagnolette lock on a door leaf or the like, comprises a strike plate having a passage opening for a drive bolt which is spring-loaded in the direction of the extended locked position of the drive bolt; a lock housing which is connected to the strike plate; a clamping plate which is accommodated in the lock housing in a spring-loaded manner, a clamping lug of which surrounds the drive bolt, and via which the drive bolt may be blocked in any retracted position; and a spring-loaded latch that can be moved in the lock housing passes through the strike plate, and may be pushed into the lock housing against the spring force in order to pivot the clamping plate into a release position in which the drive bolt is released. In addition, the switch lock comprises a safeguard against push back which may be activated by a pressure exerted on the drive bolt portion in the unlocking direction, said drive bolt portion protruding out of the latch when the drive bolt is in the extended locked position, in order to prevent a further movement of the drive bolt in the unlocking direction.

On the basis of the design according to the invention, a substantially higher protection against burglary results from a relatively simple structure of the switch lock. Thus, in particular, it is at least more difficult to pry the espagnolette out, for example, by an encroachment in the upper door gap.

According to one preferred embodiment of the switch lock according to the invention, the safeguard against push back comprises locking means having

varying outer radial dimensions, whose outer radial dimensions increase when pressure is exerted on the protruding drive bolt portion.

Advantageously, the safeguard against push back additionally comprises an annular closure disk, concentric to the drive bolt, which is arranged such that the locking means are prevented by their increased outer radial dimensions from penetrating the closure disk when pressure is exerted on the protruding drive bolt portion. The closure disk may be mounted, in particular, fixedly in the lock housing.

The locking means may be arranged, for example, axially between two portions of the drive bolt that are movable relative to one another in an axially limited way.

According to one appropriate, practical embodiment of the switch lock according to the invention, the safeguard against push back has a flexible locking element. Said flexible locking element is thereby itself preferably designed as a spring element.

It is particularly advantageous if the flexible locking element comprises a plurality of spring arms, varying in their outer radial dimensions, said spring arms are elastically deformable such that their outer radial dimensions increase when pressure is exerted on the protruding drive bolt portion.

The spring arms of the flexible locking element come to rest on the closure disk when pressure is exerted on the protruding drive bolt portion.

According to an advantageous alternative embodiment of the switch lock according to the invention, the locking means comprise a ball lock.

The ball lock in this regard comprises multiple radially movable balls, which can be moved radially outwards and come to rest on the closure disk when pressure is exerted on the protruding drive bolt portion.

The balls of the ball lock may be pressed radially outwards when pressure is exerted on the protruding drive bolt portion, for example, via a truncated cone portion or the like which is connected to the protruding drive bolt portion.

To transition the drive bolt into its unlocked position, said drive bolt should be moved, in particular together with the locking element, axially in the unlocking direction.

At least the lock housing may be composed at least partially of plastic material.

According to one preferred practical embodiment of the switch lock according to the invention, the lock housing and the latch are each designed as hollow cylinders and are arranged, together with the annular clamping plate, concentrically with respect to the drive bolt, as a result of which a compact structure of the switch lock is achieved.

It is also particularly advantageous if the switch lock is at least partially mountable via snap connections. The assembly of the switch lock is thus substantially simplified.

The lock housing may be reinforced in particular by a sheet metal part, by which means a more robust structure of the switch lock is achieved.

The invention is explained in more detail below on the basis of embodiments with reference to the drawing, in which the following are shown:

Fig. 1 a schematic representation of an exemplary embodiment of a switch lock according to the invention in a phase in which the drive bolt assumes its locked position,

- Fig. 2 a schematic representation of an exemplary embodiment of a switch lock according to the invention, having a flexible locking element, wherein the lock housing has been omitted and the lock is located in a phase in which the drive bolt assumes its locked position and no pressure is exerted in the unlocking direction,
- Fig. 3 a schematic representation of the switch lock according to Figure 2 without a lock housing in a phase in which the drive bolt assumes its locked position and pressure is exerted on the drive bolt portion protruding from the latch,
- Fig. 4 different views of the flexible locking element of the switch lock according to Figures 2 and 3,
- Fig. 5 a schematic representation of another exemplary embodiment of a switch lock according to the invention, having a ball lock, wherein the lock housing has been omitted and the lock is in a phase in which the drive bolt assumes its locked position and is not subjected to pressure in the unlocking direction,
- Fig. 6 a schematic representation of the switch lock according to Figure 5 without a lock housing in a phase in which the drive bolt assumes its locked position and pressure is exerted on the drive bolt portion protruding from the latch, and
- Fig. 7 a simplified representation of the operating principle of a switch lock according to the invention, wherein the lock housing is again omitted.

Figures 1 to 7 show different exemplary embodiments of a switch lock 10 according to the invention, provided in particular for an espagnolette lock on a door leaf or the like. Different switch locks 10 each comprise a strike plate 12 having a passage opening 14 for a drive bolt 16 which is spring-loaded in the direction of the extended

locked position of the drive bolt; a lock housing 18 which is connected to the strike plate 12; a clamping plate 20 which is accommodated in lock housing 18 in a spring-loaded manner, a clamping lug of which surrounds drive bolt 16, and via which drive bolt 16 can be blocked in any retracted position; and a spring-loaded latch 22 that may be moved in the lock housing 18 passes through strike plate 12, and can be pushed into the lock housing 18 against the spring force in order to pivot the clamping plate 20 into a release position in which the drive bolt 16 is released.

The lock housing 18 and latch 22 are each designed as hollow cylinders and are arranged, together with the annular clamping plate 20, concentrically with respect to the drive bolt 16.

In addition, different switch locks 10 each comprise a safeguard against push back 24 which may be activated by a pressure exerted on the drive bolt portion 26 in the unlocking direction, said drive bolt portion protruding out of the latch 22 when drive bolt 16 is in the extended locked position, in order to prevent a further movement of drive bolt 16 in the unlocking direction.

Each safeguard against push back 24 comprises locking means 28, 36 having varying outer radial dimensions, whose outer radial dimensions increase when pressure is exerted on the protruding drive bolt portion 26.

In addition, the safeguard against push back 24 comprises an annular closure disk 34, concentric to drive bolt 16, on which locking means 28, 36 come to rest when pressure is exerted on the protruding drive bolt portion 26. Locking means 28, 36 are prevented by their increased outer radial dimensions from penetrating closure disk 34 when pressure is exerted on the protruding drive bolt portion 26. The closure disk 34 may be fixedly mounted in particular in the lock housing 18.

As is particularly clear from Figures 2 to 5, locking means 28, 36 are arranged in particular axially between two portions 16', 16'' of drive bolt 16, said portions being movable relative to one another in an axially limited manner.

At least lock housing 18 may be composed at least partially of plastic material.

Switch locks 10 may each be mountable at least partially via snap connections. In addition, each lock housing 18 may be reinforced by a sheet metal part.

Figure 1 shows a complete switch lock 10 according to the invention in a phase in which the drive bolt 16 assumes its locked position.

Figures 2 and 3 show in schematic representation an exemplary embodiment of a switch lock 10 according to the invention in which locking means 28, 36 comprise a flexible locking element 28. The flexible locking element 28 may itself, in particular, be designed as a spring element. Figure 4 shows an exemplary embodiment of the flexible locking element 28 in different views.

The flexible locking element 28 comprises multiple spring arms 30, varying in their outer radial dimensions, said spring arms being elastically deformable such that their outer radial dimensions increase when pressure is exerted on protruding drive bolt portion 26. The spring arms 30 of the flexible locking element 28 in the process come to rest on the closure disk 34 when pressure is exerted on the protruding drive bolt portion 26.

Figure 2 shows the switch lock 10 in a phase in which the drive bolt 16 assumes its locked position and no pressure is exerted in the unlocking direction. The spring arms 30 may thus penetrate the closure disk 34.

In contrast, Figure 3 shows switch lock 10 in a phase in which the drive bolt 16 assumes its locked position and pressure is exerted on the drive bolt portion 26 protruding from latch 22. In this case, spring arms 30 are elastically deformed such that they extend radially further outwards and are prevented accordingly from penetrating the closure disk 34.

Figures 5 and 6 shown in schematic representation an exemplary embodiment of a switch lock 10 according to the invention in which locking means 28, 36 comprise a ball lock 36.

The ball lock 36 comprises multiple radially movable balls 38, which are movable radially outwards and come to rest on the closure disk 34 when pressure is exerted on the protruding drive bolt portion 26.

Figure 5 shows the switch lock 10 in a phase in which the drive bolt 16 assumes its locked position and no pressure is exerted in the unlocking direction. The balls 38 may thus penetrate the closure disk 34.

In contrast, Figure 6 shows the switch lock 10 in a phase in which the drive bolt 16 assumes its locked position and pressure is exerted on the drive bolt portion 26 protruding from latch 22. In this case, the balls 38 are pressed radially further outwards and are thus prevented from penetrating the closure disk 34.

The balls 38 of the ball lock 36 may be pressed radially outwards when pressure is exerted on the protruding drive bolt portion 26, for example, via a truncated cone portion 32 connected to the protruding drive bolt portion 26. Said truncated cone portion 32 thereby comes to rest on an end stop 40 in the phase depicted in Figure 6. Basically, however, another impingement on balls 38 by the pressure exerted on protruding drive bolt portion 26 is also conceivable.

Figure 7 shows again in schematic representation the just described operating principle of a switch lock 10 according to the invention. As a consequence of the pressure exerted on the drive bolt portion 26 protruding from the latch 22, a force F acting axially on the drive bolt 16 is converted into radial forces F which cause an increase in the outer radial dimensions of the locking means 28, 36 with varying outer radial dimensions. Thus, in the embodiment depicted in Figures 2 and 3, spring arms 30 of the flexible locking element 28 are elastically deformed such that their outer radial dimensions increase, whereas in the embodiment depicted in

Figures 5 and 6, the balls 38 of the ball lock 36 are moved radially further outwards. When pressure is exerted on the protruding drive bolt portion 26, then the spring arms 30 of the flexible locking element 28 (cf. Figures 2 and 3) or the balls 38 of the ball lock 36 (cf. Figures 5 and 6) come to rest on the closure disk 34, as a result of which the locking means 28 or 36 are prevented from penetrating the closure disk 34.

To transition the drive bolt 16 into its unlocked position, said drive bolt should be moved, together with the locking element 28, axially in the unlocking direction.

Reference sign list

10	Switch lock
12	Strike plate
14	Passage opening
16	Drive bolt
16'	Drive bolt portion
16"	Drive bolt portion
18	Lock housing
20	Clamping plate
22	Latch
24	Safeguard against push back
26	Protruding drive bolt portion
28	Flexible locking element
30	Spring arm
32	Cone portion
34	Closure disk
36	Ball lock
38	Ball
40	End stop

Patent claims

1. A switch lock (10), in particular for an espagnolette lock on a door leaf or the like, comprising a strike plate (12) having a passage opening (14) for a drive bolt (16) which is spring-loaded in the direction of the extended locked position of the drive bolt, a lock housing (18) which is connected to the strike plate (12), a clamping plate (20) which is accommodated in the lock housing (18) in a spring-loaded manner, a clamping lug of which surrounds the drive bolt (16), and via which the drive bolt (16) can be blocked in any retracted position, and a spring-loaded latch (22) that can be moved in the lock housing (18) and passes through the strike plate (12), and which can be pushed into the lock housing (18) against the spring force in order to pivot the clamping plate (20) into a release position in which the drive bolt (16) is released, wherein the switch plate (10) comprises a safeguard against push back (24) which can be activated by a pressure exerted on the drive bolt portion (26) in the unlocking direction, said drive bolt portion protruding out of the latch (22) when the drive bolt (16) is in the extended locked position, in order to prevent a further movement of the drive bolt (16) in the unlocking direction.
2. The switch lock according to claim 1, characterized in that the safeguard against push back (24) comprises locking means (28, 36) having varying outer radial dimensions, which increase when pressure is exerted on the protruding drive bolt portion (26).
3. The switch lock according to claim 2, characterized in that the safeguard against push back (24) additionally comprises an annular closure disk (34), concentric to the drive bolt (16), and the locking means (28, 36) are prevented by the increased outer radial dimensions thereof from penetrating the closure disk (34) when pressure is exerted on the protruding drive bolt portion (26).

4. The switch lock according to any one of the preceding claims, characterized in that the locking means (28, 36) are axially arranged between two sections (16', 16'') of the drive bolt (16), said two sections being movable relative to one another in an axially limited manner.
5. The switch lock according to one of the preceding claims, characterized in that the locking means (28, 36) comprise a flexible locking element (28).
6. The switch lock according to claim 5, characterized in that the flexible locking element (28) is designed as a spring element.
7. The switch lock according to claim 5 or 6, characterized in that the flexible locking element (28) comprises multiple spring arms (30), varying in the outer radial dimensions thereof, said spring arms being elastically deformable when pressure is exerted on the protruding drive bolt portion (26) such that the outer radial dimensions thereof increase.
8. The switch lock according to claim 7, characterized in that the spring arms (30) of the flexible locking element (28) in the process come to rest on the closure disk (34) when pressure is exerted on the protruding drive bolt portion (26).
9. The switch lock according to any one of claims 1 to 4, characterized in that the locking means (28, 36) comprise a ball lock (36).
10. The switch lock according to claim 9, characterized in that the ball lock (36) comprises a plurality of radially movable balls (38), which are movable radially outwards and come to rest on closure disk (34) when pressure is exerted on the protruding drive bolt portion (26).

11. The switch lock according to claim 10,
characterized in that the balls (38) of the ball lock (36) are pressed radially
outwards via a truncated cone portion (32) or the like, which is connected to
the protruding drive bolt portion (26), when pressure is exerted on the
protruding drive bolt portion (26).
12. The switch lock according to any one of the preceding claims,
characterized in that at least the lock housing (18) is composed at least
partially of plastic material.
13. The switch lock according to any one of the preceding claims,
characterized in that the lock housing (18) and the latch (22) are each
designed as hollow cylinders and are arranged, together with the annular
clamping plate (20), concentrically with respect to the drive bolt (16).
14. The switch lock according to any one of the preceding claims,
characterized in that same is at least partially mountable by means of snap
connections.
15. The switch lock according to any one of the preceding claims,
characterized in that the lock housing (18) is reinforced by a sheet metal part.