Pin tumblers are used in pin tumbler cylinder locks. The pin tumblers provides a key specific code, and prevents rotation of an inner cylinder in relation to an outer structure of the pin tumbler cylinder lock in case a correct key in not used.

The prior known disc tumbler cylinder lock solutions and pin tumbler cylinder locks provide, as such, a good safeguard against manipulation but it is still desirable to improve protection solutions.

Brief description of the invention

Embodiments of the invention improve the qualities of a cylinder lock against manipulation and to improve the safety of a cylinder lock and key combination.

According to an aspect of the present invention, there is provided a cylinder lock and key combination, wherein the cylinder lock includes an inner structure arrangement, which includes a key profile opening, and the key includes a moveable element, wherein the key includes a slot which is transverse in relation to a longitudinal axis of a shaft of the key, and the moveable element is arranged to move along the slot, the inner structure arrangement includes a locking mechanism including a roller, a locking piece arrangement, and a return spring arrangement, the roller including a guiding surface on an end of the roller, which end is in the key profile opening, the roller being also in connection with the locking piece arrangement and the return spring arrangement, the return spring arrangement being arranged to turn the roller towards a locking position of the roller, which roller in it’s locking position is arranged in cooperation with the locking piece arrangement to prevent the inner structure arrangement from turning, the inner structure arrangement having at least one second guiding surface on at least one side of the key profile opening to move the moveable element along the slot when inserting the key into the cylinder lock in order that the moveable element is in a position for contacting the guiding surface and turning the roller when the key is further pushed into cylinder lock, the inner structure arrangement further including at least one third

guiding surface on at least one side of the key profile opening to move the moveable element along the slot, and with the guiding surface, to turn the roller to an open position when the key is yet further pushed into cylinder lock, the guiding surface being further arranged to move the moveable element along the slot when pulling the key away from the cylinder lock and as response to this movement of the moveable element the roller being arranged to turn towards it's locking position.

List of figures

The invention will now be described in more detail with reference to the accompanying drawing figures, in which

Fig. 1 shows an example of a disc tumbler cylinder lock and a key of the invention,

Fig. 2 shows an example for a key of the invention,

Fig. 3 shows the example of the cross-section view of the key in fig 2,

Fig. 4 shows an example of a partial view of the shaft of the key in fig. 2,

Fig. 5 shows an example of a rotation limiter and guiding element according to the invention,

Fig. 6 shows the rotation element of fig. 5 in a section view,

Fig. 7 shows a section view of the rotation limiter in a position wherein the roller is turning towards an open position,

Fig. 8 shows a section view of the rotation limiter in a position wherein the roller is in an open position,

Fig. 9 shows a working example of rotation limiter for a disc tumbler cylinder lock of the invention when the key is pushed into the disc tumbler cylinder lock