A BLANK, SECURITY KEY, LOCK SYSTEM AND MANUFACTURING METHOD

The invention relates to a blank, to a security key and to a lock system with security keys and with assigned cylinders, as well as to a method for manufacturing the security key from a blank, according to the preamble of the independent claims.

With regard to lock technology, there exist the basic tasks of firstly preventing the unauthorised replication of keys with better and better means or rendering it more difficult, and on the other hand of increasing the number of possible permutations of a key and thus also the security of the lock systems.

A lock system with security turn keys is known from EP 1 185 755 as the closest state of the art, which at the key tip comprise a horizontal blocking groove with a coded blocking depth. A blocking tumbler pin pair, consisting of a standard coding pin (coding tumbler pin) and an extended standard blocking counter pin preventing the complete insertion of a key with a blocking groove which is not deep enough, is attached at the rearmost coding position in the assigned cylinder. This blocking groove coding results in high permutation capacities. Such a horizontal blocking groove however is still not too difficult to copy or replicate.

~~It is therefore the object~~Embodiments of the present invention~~,~~ seek to provide a system with blanks, security keys and with assigned cylinders which significantly improves the characteristics of known systems, in particular of the known block-code system according to EP 1 185 755, with additional security functions, an improved replication protection for keys and blanks by way of a shaping which is difficult to define and copy and which moreover permits higher permutation capacities. Moreover, a reliable functioning over a long period of use and robustness with respect to wear are to be achieved, and a rational, inexpensive series production is to be possible. Above all, the new shaping should also not necessitate additional space on the key with several coding rows. A complete market range is to be covered by only one type of blank, and unauthorised key replications by way of key-cutting services are to be prevented.

~~According to the invention, this object is achieved by a blank according to patent claim 1, by a security key with an assigned cylinder according to patent claim 9, by a lock system with security keys and with assigned cylinders according to patent claim 15, as well as by a method for manufacturing such keys from blanks, according to patent claim 16.~~

According to an aspect, a blank for manufacturing a security key with at least two coding rows / pin rows on the flat sides of the key for an assigned cylinder with tumbler pins and with counter pins of a lock system with an insertion block, acting in a vertical direction to the key axis, wherein two parallel lateral grooves and a central projecting part between the lateral

grooves, and which are formed parallel to the key axis and symmetrically to the central plane of a coding row / pin row, wherein the lateral grooves and the central projecting part are extending from the key tip to a coding region of the first coding positions, and said lateral grooves in an entry region at the key tip running at a high level and in the coding region of the first coding positions running in a sunk manner at a lower level, wherein the lateral grooves are suitably shaped, in order to correspond to additional lateral shoulders of an associated circularly symmetric special tumbler pin and an extended counter pin at the rearmost coding position of the cylinder, so that an additional insertion block acting in a vertical direction to the key axis in the entry region and an additional rotation block in the coding region can be carried out by the lateral grooves of the blank and the lateral shoulders of the associated special tumbler pin.

According to another aspect, a security key with at least two coding rows / pin rows on the flat sides of the key for an assigned cylinder with tumbler pins and with counter pins of a lock system with an insertion block, acting in a vertical direction to the key axis, wherein two parallel lateral grooves and a central groove and a central projecting part between the lateral grooves, and these are formed parallel to the key axis and symmetrically to the central plane of a coding row / pin row, wherein the lateral grooves and the central groove and the central projecting part are extending from the key tip to a coding region of the first coding positions, wherein coding recesses are formed at the first coding positions in the region of the central groove in the coding region, and wherein the lateral grooves in an entry region at the key tip running at a high level and in the coding region of the first coding positions running in a sunk manner at a lower level, wherein the lateral grooves are suitably shaped, in order to correspond to additional lateral shoulders of an associated circularly symmetric special tumbler pin and an extended counter pin at the rearmost coding position of the cylinder, so that an additional insertion block acting in a vertical direction to the key axis in the entry region and an additional rotation block in the coding region can be carried out by the lateral grooves of the key and the lateral shoulders of the associated special tumbler pin.

According to another aspect, a lock system with security keys with at least two coding rows / pin rows on the flat sides of the key and with assigned cylinders with tumbler pins and with counter pins and with an insertion block, acting in a vertical direction to the key axis, wherein keys with two parallel lateral grooves and a central groove which are formed parallel to the key axis and symmetrically to the central plane of a pin row, with coding recesses in the region of the central groove at first coding positions, wherein the lateral grooves and the central groove or a central projecting part are extending from the key tip to a coding region of the first coding positions, and said lateral grooves in an entry region at the key tip running at a high level and in the coding region of the first coding positions running in a sunk manner at a lower level, and with assigned cylinders with a circularly symmetric special tumbler pin at the rearmost coding position of the cylinder, said special tumbler pin comprising additional lateral shoulders,

wherein these lateral shoulders of the special tumbler pin are shaped such that they correspond to the lateral grooves of the key, and wherein in the entry region, the length of the special tumbler pin and an extended counter pin up to the lateral shoulder corresponds to the distance from the cylinder housing up to the lateral groove, and at a first coding position, the length of the special tumbler pin up to the lateral shoulder corresponds to the distance from the shear line up to the lateral groove, with a tolerance region, so that an additional insertion block acting in vertical direction to the key axis in the entry region and an additional rotation block in the coding region can be carried out with the lateral grooves of the key and with the lateral shoulders of the assigned special tumbler pin.

This new blank block-code system emanates for example from the previous block-code system and additionally comprises new features, characteristics and functions, with which the mentioned objects can be achieved, as shown and explained further also by way of the figures.