Title: KEY-HOLDER WITH AUTOMATIC KEY EXTRACTION

Abstract: Key-holder with automatic key extraction comprising a containment space (2) inside of which there are a plurality of keys (4), as well as a plurality of devices for anchoring (3, 3') and moving (5) said keys and characterised in that: said anchoring device (3, 3') comprises at least one tongue (9) and a pin (10) suitable for blocking the key by means of a rotation of the pin (10); said key moving mechanism comprises at least one pin (10) with helical spring (11) so that the central axis of the helical spring is perpendicular to the plane of rotation of the key (4).
Technical description of the industrial invention having the title:

**Key-holder with automatic key extraction**

to Alcibiade Cardanobile, Michele Cardanobile, Fabio Leccacorvi, Italian citizens, by proxy of the office of Laforgia, Bruni & Partners, Giovanni Bruni, and electively domiciled for legal purposes in Torino, Corso Duca degli Abruzzi n. 78.

The object of the present finding is an key-holder with automatic key extraction that is improved both in the ability to contain a plurality of keys in a single body and in the way of moving and blocking one or more keys.

In the field of mechanics, the key is an object that allows a lock to be opened and closed, said key consisting of a thin metal bar, provided with notched throats to form teeth and/or grooves or small recesses that correspond to the shape of the lock and its internal mechanisms. The blade and a portion wider than the blade, suitable for making the key easier to grip, known as handgrip, thus allow the lock to be opened, normally through a rotation. Said handgrip is supplied with a hole, round or rectangular, known as keyring hole, suitable for inserting the key into the classic key-holder consisting of a metallic ring. A group of keys normally used by everyone, to enter their own homes, to lock their vehicle, for the garage, for the office and other locks, such as those for alarms, gates and mailboxes is known as a set of keys. Of course, in order to simply recognise one key within the set, the handgrip is usually shaped or coloured.
The key-holder groups together a plurality of keys in a single body. Said key-holder is widely used in different types and designs: key-holders made from metal, leather, fabric and plastic; key-holders with a case, key-holders accessorized with torch, pen, soft toy and similar.

In the state of the art different embodiments of such products are known. For example, patent application No. EP 1088953 describes a sliding mechanism for extraction/withdrawal of keys from a space. The device essentially consists of a lower support having a guide along which the key slides and with lateral blocking devices, an upper support for closing the space thus formed, and finally a spring between the key and the lower support. In closed resting position, the key is contained in the space and blocked by the lateral stop devices, whereas the spring is compressed. In open position when in use, the blocking devices are released, the spring is free to expand and actuate the sliding of the key along the guide, so that the key is only partially contained in the space in order to allow the insertion of the blade in the lock. Similarly, with the reverse procedure the key is withdrawn from inside the space.

Another example is given in patent application No. US 4941569 in which a key-holder is described comprising a rectangular space inside of which a flat key and a mechanism for rotating said key are contained. The containment space consists of an L-shaped double axis (seen in length), the longer side of which
extends along the side edge of the space, whereas the shorter side extends along the upper edge.

In the closed position, the blade of the key is located along the longer side of the "L", whereas the handgrip of the key enters into the shorter side located approximately in a corner of the space. At the moment of use, the blade of the key rotates around the pin fixed with the handgrip, to reach an open position.

A further example is given in patent application No. US3696649 where a key-holder is described consisting of two spaces, one outer and one inner. Said inner space has one or more housings in which it is possible to arrange a key; each housing is separated from the other by dividing walls. The key is fastened with stops inside the housing that allow it to rotate but not be removed.

Known embodiments have drawbacks linked to the fact that they can contain a single key (or a very small number) and the extraction of the key is of the manual type.

The purpose of the finding object of the present invention is to provide a key-holder equipped with a plurality of automatic extraction keys with the characteristics specified in claim 1.

The finding object of the present invention solves the aforementioned technical problems in that it concerns a key-holder with automatic key extraction comprising a containment space, a plurality of anchoring devices, to which a plurality of keys are respectively fastened, moving means and finally a blocking system suitable for preventing the keys from moving in the containment space.
These and other advantages will become clear from the detailed
description of the model that will refer specifically to drawings
1/5 to 5/5 in which a preferred example embodiment of the
present finding is represented, absolutely not for limiting
purposes.

In particular:

- Fig. 1 represents a three-dimensional view of a key-holder with six keys with modified handgrip;
- Fig. 2, in views "a" to "e", shows a plan and perspective views of the key-holder in Fig. 1, whereas views "d" and "e" respectively show a section passing through two pins and the detail of the moving means, with the keys in rest position;
- Fig. 3, in views "a" to "e", shows the plan view of the key-holder of Fig. 1, a section passing through two pins and, finally, the detail of the moving means, with the keys in use position;
- Fig. 4, in views "a" and "b", shows a horizontal section of the key-holder in Fig. 1 in closed position and the detail of the handgrip of the key with modified handgrip;
- Fig. 5 represents a three-dimensional view of a key-holder with six keys with classic handgrip;
- Fig. 6, in views "a" to "e", shows a plan and perspective views of the key-holder in Fig. 5, whereas views "d" to "f" depict two sections and a detail of the moving means with the keys in rest position;
• Fig. 7 represents the blocking system of the key-holder in Fig. 1;

• Figs. 8 and 9 show perspective views of further example embodiments of the key-holder, the first with a cross-shaped profile with sixteen keys, whereas the second has a rectangular shape with eight keys, respectively;

• Fig. 10, finally, in views "a" to "b" shows a further embodiment of a key-holder with star-shaped profile comprising six keys in use position.

With reference to the aforementioned figures, the key-holder with automatic key extraction according to the invention is generically indicated with 1. It comprises a containment space 2, a plurality of anchoring devices 3', 3" to which a plurality of keys 4 are respectively fastened, means for moving the key 5, and finally a key blocking system 6. 

Said plurality of anchoring devices 3', 3" with the respective keys 4 are contained in the containment space 2. The size of the containment space 2 varies according to the number of keys to be contained. Said keys 4 differ in size, type of blade and handgrip. In particular, the handgrip of the keys can be of the classic type 7 with rounded shape as shown in Figs. 5 and 6, or else equipped with special shaping suitable for facilitating anchoring. Said key with shaped handgrip requires a prior modification of the handgrip in order to be housed in the anchoring device 3'. An example of a key with modified handgrip is indicated with 8 in Fig. 4.
The anchoring device 3', 3" of the key comprises two bayonet tongues 9, suitable both for blocking the key with a quarter-turn of the pin 10 and for removing and possibly repositioning the key quickly.

Every anchoring device 3', 3" corresponds to a key 4 and a means for moving the key 5. Said moving means 5 comprises a pin 10 passing through the bayonet tongues with helical spring 11.

The key-holder with automatic key extraction 1 takes up the closed or rest position and the open or use position.

In closed position, one or more keys are received fully in the containment space 2, as represented in Figs. 1, 2, 4 and 6. Whereas in open position (Fig. 3 and 5), the blade of at least one key 4 is completely exposed outside of the space 2 in order to allow both its insertion inside the cylinder of the lock and the rotation of the cylinder to open or close the lock. It goes from the closed position into the open position when one or more keys are moved. The movement of a key takes place by pressing the pin 10, which biases the helical spring 11 placing it in torsion, and it exerts a rotation of the anchoring device 3 so that the key is free to rotate outwards. In particular, the expulsion of the key 4 by rotation is permitted by the positioning of the spring 11 so that the central axis of the helical spring 11 is perpendicular to the plane of rotation of the key 4. In the contrary case, it goes from the open position to the closed position by simply manually
guiding one or more keys 4 towards the inside of the containment space 2.

According to an alternative way of operating, the helical spring 11 is unloaded with the key in closed position. The movement of the key 4 takes place through mechanical action exerted by the finger, against the elastic force of the spring that is being loaded, and the key is then blocked by means of a blocking system. The key is closed automatically by pressing the pin 10, which releases the key allowing the previously biased helical spring 11 to take the key back into closed position.

Finally, the blocking system allows the means for moving one or more keys 5 to be blocked. With reference as an example to the key-holder of Fig. 1, said blocking system comprises two articulated shafts 12, 13, a hinge 14, a guide pin 16 and a control lever 17. In particular, the hinge 14 is suitable for articulating the two shafts 12 and 13 and is arranged in an intermediate point of the shaft 12 and at an end of the shaft 13, whereas the pin 16 guides the shaft 13 in movement. The blocking system is actuated by means of the control lever 17: in particular, the shaft 12 rotates around the hinge 14 so that each end thereof engages with a tooth 18 made on each pin 10; the shaft 13 moves with alternate rectilinear motion in a slit 15 guided by the pin 16 making the lever perform a rolling translation in order to block the movement of a further pin 10.

According to a first embodiment (Figs. 1 and 5) the key-holder is equipped with a triangular containment space 2 and foresees
containing six keys of different type, in particular both keys with classic handgrip (Fig. 5), and keys with modified handgrip (Fig. 1).

A second and a third embodiment (Figs. 8 and 9) respectively show a key-holder with cross-shaped profile that can contain up to sixteen keys and a rectangular key-holder suitable for containing up to eight keys.

Moreover, a fourth embodiment is illustrated in Fig. 10, where six keys 4 are arranged to form a star-shaped profile, whereas the moving means 5 allow the key to be extracted by translation since the spring is positioned so that the axis of the spring and the longitudinal axis of the key coincide. Of course, in all of the following embodiments, the spring can also act according to both the ways of operating described with regard to the first embodiment; in other words, the elastic element can cause the key to come out or else go back into its seat.

Of course, the embodiments presented above are only some non-limiting example embodiments of the finding.

Moreover, where the containment space 2 has empty spaces, like for example the central portion of the containment space 2 of triangular shape in Fig.1, or replacing at least one key, small gadgets are able to be inserted: small torches, jewels, medals, soft toys, digital audio players like for example mp3 players, memory cards like for example USB sticks, electronic keys, screwdrivers, scissors and whatever else suitable for being able to be housed.
The use of the key-holder is very simple, and it is sufficient to perform the manual operations of simply pressing a pin to actuate the automatic extraction of a key so as to place the key-holder in open position, whereas it is sufficient to guide the key towards the inside of the containment space to arrange the key-holder in closed position.

Finally, by simply moving the lever 17 the possibility of a plurality of keys accidentally opening is prevented.

The advantages of the key-holder in object are clear: the use operations, just described, are extremely simple and can also be carried out by people of different ages; due to its simplicity it is cost-effective has low bulk both during use and at the end of use. In particular, the finding in object allows quick and easy replacement of the keys from any containment space by means of the special shaping of the keys suitable for making them easier to replace and dismount and subsequently mount a second key into the key-holder device.

Indeed, the keys are received in the containment space that protects them from possible deterioration, whereas the key blocking system eliminates the possibility of accidental opening of the key-holder causing damage to bags or pockets or anything else that might contain the key-holder.
CL A I M S

1) Key-holder with automatic key extraction comprising a containment space (2) inside which there are a plurality of keys (4), as well as a plurality of devices for anchoring (3', 3'') and for moving (5) said keys and characterised in that:
   • said anchoring device (3', 3'') comprises at least one tongue (9) and a pin (10) suitable for blocking the key by means of a rotation of the pin (10);
   • said key moving mechanism (5) comprises at least one pin (10) with helical spring (11) so that the central axis of the helical spring is perpendicular to the plane of rotation of the key (4).

2) Key-holder according to claim 1, characterised by at least one key blocking system (6) comprising a control lever (17), at least two articulated shafts (12, 13) connected with at least one hinge (14), and at least one pin (16) for guiding said shaft (13) in its movement in a slit (15).

3) Key-holder according to claim 2, characterised in that said hinge (14) is housed in an intermediate point of the shaft (12) and at an end of the shaft (13).

4) Key-holder according to claim 1, characterised in that said key (4) has a classic handgrip (7) with a rounded shape.

5) Key-holder according to one of claims 1 to 3, characterised in that said key (4) has a shaped handgrip (8).
6) Key-holder according to one of the previous claims, characterised in that said containment space (2) is suitable for containing in the empty spaces or instead of at least one key small gadgets like, for example, small torches, jewels, medals, soft toys, digital audio players, memory cards, electronic keys, screwdrivers, scissors and the like.

7) Key-holder according to one of the previous claims, characterised in that said containment space (2) is suitable for containing a plurality of keys (4) arranged to form a star-shaped profile.

8) Key-holder according to one of claims 1 to 6, characterised in that said key moving means (5) is suitable for extracting the key by translation.

9) Key-holder according to claim 8, characterised in that said key moving means (5) comprises at least one spring (11) positioned so that the axis of the spring and the longitudinal axis of the key (4) coincide.

10) Key-holder according to one of claims 1 to 6, characterised in that said key-holder has a cross-shaped profile.

11) Key-holder according to one of claims 1 to 6, characterised in that said key-holder is rectangle shaped.

12) Automatic extraction process of the keys of a key-holder according to one of the previous claims, characterised in that by pressing the pin (10) the helical spring (11) is biased and exerts a rotation of the anchoring device (3) with the key fastened to it.
13) Automatic extraction process according to claim 12, wherein
the key is taken from the closed position to the open position.
14) Automatic extraction process according to claim 12, wherein
the key is taken from the open position to the closed position.

15) Key blocking process for a key-holder according to one of
claims 2 to 6, characterised in that, by actuating the control
lever (17), the shaft (12) rotates around the hinge (14) and
each end of the shaft engages with a tooth (18) of each pin
(10); at the same time the shaft (13) performs a rolling-
translation for half of a pin (16), guided within a slit (15),
and an end thereof engages with the tooth (18) of a further
pin (10).
**A. CLASSIFICATION OF SUBJECT MATTER**

INV. A45C 11/32 E05B19/04

According to International Patent Classification (IPC) or to both national classification and IPC.

**B. HELD SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

A45C E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C. See patent family annex.

- Special categories of cited documents:
  - 'A' document defining the general state of the art which is not considered to be of particular relevance
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  - 'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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- 'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- 'B' document member of the same patent family

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Geerts, Arnold
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