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(71) Applicant: **Samsonite IP Holdings S.a.r.l**
1931 Luxembourg (LU)

(72) Inventor: **Van Himbeeck, Clemens**
9600 Ronse (BE)

(74) Representative: **Ruhrmann, Andrea Elizabeth**
Kilburn & Strode LLP
20 Red Lion Street
London WC1R 4PJ (GB)

(54) Lock capable of storing a key

(57) A lock may include a main body with a notch configured to receive a first portion of a key. The lock may also include a shackle movably coupled to the main body and configured to engage a second portion of the key. The shackle and notch may further be configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

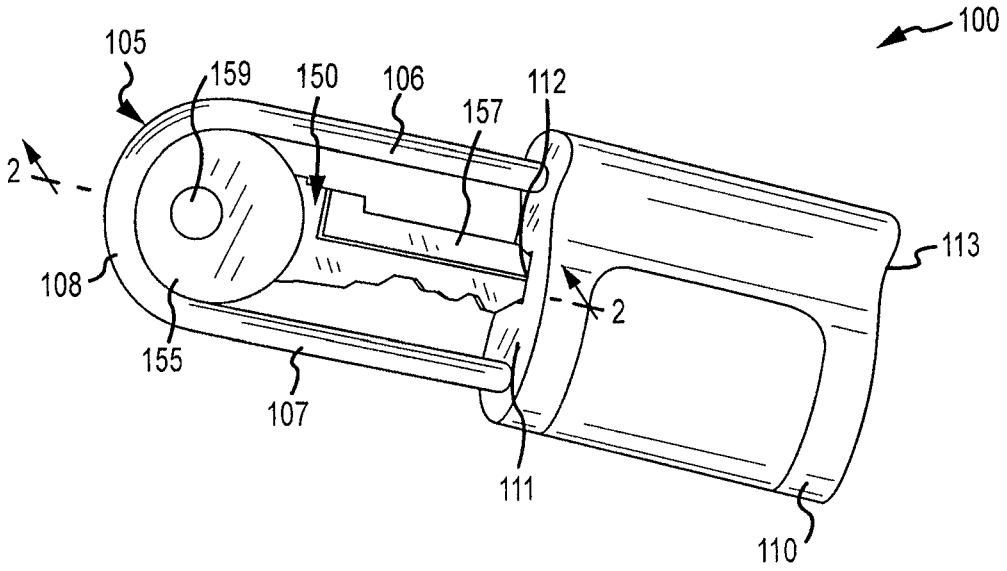

FIG.1

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Description

FIELD OF INVENTION

[0001] The field of invention generally relates to locks.

BACKGROUND

[0002] Locks are often used to prevent unauthorized access to an article or area. For example, while traveling, many travelers attempt to lock or otherwise secure their luggage or laptop cases from unauthorized access. Typically, luggage or other cases are secured by affixing a locking mechanism to one or more access points. As another example, a lock may be used to secure a trailer or storage unit. As still another example, a lock may be used to secure a door or fence. Each lock may have an associated key that is kept by the owner of the lock, to unlock the lock.

[0003] When a particular lock is not in use, it may be stored. For example, locks used to secure luggage while traveling may be stored while the luggage is not in use. If a lock is stored, the owner of the lock may also store the key associated with that lock. In some cases, the key may be stored in the same general area as the lock, while in other cases, the key may be stored separately from the lock. In some cases, a key may include a chain which is then used to removably join the key to a shackle of the lock. In this storage scenario, it may be inconvenient to remove the key from the shackle. In other cases, a key may be placed in the locking mechanisms of the lock for storage. In this case, the key may fall out of the locking mechanism, which may result in the key being lost.

SUMMARY OF THE INVENTION

[0004] The invention is defined in the independent claims. Preferred or optional features are set out in the independent claims thereto. The lock is considered to constitute an invention in its own right, with or without the key.

[0005] One embodiment of a lock includes a main body with a notch configured to receive a first portion of a key. The lock also includes a shackle movably coupled to the main body and configured to engage a second portion of the key. The shackle and the notch are further configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

[0006] Another embodiment of a lock includes a main body with a first surface. The first surface of the main body includes a notch, and includes a shackle extending from the first surface. The shackle includes a pair of spaced apart, substantially linear portions. The notch is positioned between the substantially linear portions of the shackle on the first surface and is configured to receive a first portion of a key. The shackle is configured to engage a second portion of the key. The shackle and the notch are configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

[0007] One embodiment of manufacturing a lock includes joining a shackle with a main body and forming a notch in the main body. The notch is configured to receive a first portion of a key, and the shackle is shaped to engage a second portion of the key. The shackle and the notch are configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 shows a front perspective view of an embodiment of a lock and key, with the key stored between the shackle and main body of the lock.

[0009] Fig. 2 shows a front partial cross-section view of the lock and key of Fig. 1, viewed along line 2-2 in Fig. 1.

[0010] Figs. 3A through 3F show side cross-section views of the lock and key of Fig. 1, viewed along line 3-3 in Fig. 2.

[0011] Figs. 4A through 4D show various perspective views of the lock and the key of Fig. 1. Fig. 4A shows the key stored between the shackle and main body of the lock. Fig. 4B demonstrates a force being applied to the key to separate the key from the lock. Fig. 4C shows the key removed from the lock. Fig. 4D shows the key positioned to be placed into the locking mechanism of the lock.

[0012] Figs 5A through 5D show front views of the lock and key of Fig. 1, with the key and shackle in various configurations.

DETAILED DESCRIPTION

[0013] Described herein is a lock capable of storing a key. The lock may include a main body and a shackle. The main body may include a locking mechanism. The locking mechanism may selectively engage and release a shackle when operated with a key. The main body may also include a notch on the side of the main body proximate the shackle. The shackle may be in the shape of a "U" or the like. The cross section of the shackle viewed along the shackle's length may generally be round or circular. The shackle, the main body, and the key may be configured such that the key may be selectively secured to the lock by positioning the key between the shackle and the main body. The shackle, the main body, and the key may be further configured to remove the key from this second position by applying a sufficient force to the key to disconnect it from the shackle. The base portion of the key may be at least partially plastic or rubber, or any other material that provides a sufficient amount of deformation to allow the key to be disconnected from the shackle when secured to the lock.

[0014] Fig. 1 is a front perspective view of a lock 100 capable of storing a key 150. The lock 100 may include a shackle 105 movably coupled to a main body 110. The shackle 105 may be defined by two shafts 106, 107, or other substantially linear and spaced apart portions of the shackle, and a connecting link 108 that joins the two shafts 106, 107. The shafts 106, 107 of the shackle 105 may extend from a first surface 111 of the main body 110. The shackle 105 may be a "U" shaped hardened structure with a rounded connecting link 108 (as shown in Fig. 1), and may be made of metal, plastic, or any other suitably strong material. The metal may be anodized or treated in any other fashion, and may also be a type of metal that is difficult to cut. Alternatively, the shackle 105 may be a generally "U" shaped structure with a flat or straight connecting link 108 (not shown in Fig. 1). The cross section of the shackle 105 may be cylindrical, some other convex shape, or even a concave shape, as described below in more detail. The connecting link 108 may be configured to engage a base portion 155 of a key 150, and the shafts 106, 107 of the shackle 105 may be long enough to store the key 150 between the shackle 105 and the main body 110 of the lock 100. A first shaft 106 of the shackle 105 may be permanently, telescopically, and rotatably coupled with the main body 110 of the lock 100, while a second shaft 107 of the shackle 105 may be releasably secured to the main body 110 via a locking mechanism 170. The second shaft 107 may have a notch 109 configured to selectively engage a pin 171 of the locking mechanism 170.

[0015] The main body 110 of the lock 100 may include a notch 112 on the same first surface 111 from which the shafts 106, 107 may extend, and the notch 112 may be configured to receive a lower part of the blade portion 157 of the key 150. The notch 112 may be positioned between the shafts 106, 107 of the shackle 105. The notch 112 may be wider than the blade 157 of the key 150 to allow the key 150 a small amount of play when it is positioned within the notch 112. Alternatively, the notch 112 may be the same width as the blade 157 of the key 150. The main body 110 may also include a locking mechanism 170 (not visible in Fig. 1, but described below). The locking mechanism 170 may be accessed by the key 150 through a second surface 113 of the main body 110. The main body 110 may generally be any shape, and may be made of metal or any other suitably strong material.

[0016] Still with reference to Fig. 1, the key 150 may be selectively positioned between the notch 112 and the shackle 105. The key 150 may include a first or base portion 155 and a second or blade portion 157. The base portion 155 may be a bow that may facilitate applying torque to turn the key 150 when engaged with a locking mechanism 170, and the blade portion 157 may include one or more grooves, and/or one or more bittings that may engage with pins, wafers, tumblers, etc. in a locking mechanism 170. The base portion 155 may be made of plastic, rubber, or any other material that has some elasticity. Alternatively, the base portion 155 may have a metal core, with a plastic, rubber, etc. over-coating or over-molding. The upper side of the base portion 155 may be configured to engage the shackle 105 of the lock 100, particularly the connecting link portion 108 of the shackle 105. For example, if the connecting link 108 is round in cross-section along its length, as shown in Fig. 1, the base portion 155 of the key 150 may be circular, as shown in Fig. 1. Alternatively, if the connecting link portion 108 of the shackle 105 is flat, the base portion 155 of the key 150 may be squared, or have another shape such that the side furthest from the blade 157 of the key 150 is flat and configured to engage with the flat connecting link 108 portion of the shackle 105. A hole 159 may be defined through the base portion 155 of the key 150, as shown in Fig. 1, through which a keychain or cord may be placed.

[0017] Referring now to Fig. 2, a front partial cross-section view of the lock 100 of Fig. 1 is shown, as viewed along line 2-2 in Fig. 1. Specifically, a cross-section is shown for the shackle 105, key 150, and the portion of the main body 110 where the second shaft 107 of the shackle 105 is releasably secured to the main body 110 via a pin 171 of the locking mechanism 170. The remainder of the main body 110 is not shown in cross-section.

[0018] As described above, the first shaft 106 of the shackle 105 may be permanently, telescopically, and rotatably coupled to the main body 110, and the second shaft 107 may be releasably secured to the main body 110. As shown in Fig. 2, the second shaft 107 may have a notch 109 that may be flat on one side and curved on another side. More specifically, the flat side may be on the side closest to the main body 110, while the curved side may be closest to the connecting link 108 of the shackle 105. This may facilitate the releasable securement by the pin 171 of the locking mechanism 170, which may similarly have one flat surface, and one curved surface.

[0019] For example, and as shown in Fig. 2, the flat surface of the pin 171 may engage with the flat surface of the notch within the second shaft 107 when the second shaft 107 is secured within the main body 110. The flat-surface-to-flat-surface interface may prevent the second shaft 107 from being withdrawn from the main body 110 of the lock 100 unless the pin 171 is retracted by the locking mechanism 170. On the other hand, when the second shaft 107 is not secured within the main body 110 by the pin 171, the curved surfaces of the pin 171 and the notch may facilitate the shaft 107 being placed into the main body 110 for securement of the shackle 105 to the main body 110. Specifically, as the shaft 107 is inserted into the main body 110, the lower edge of the shaft 107 may apply force to the pin 171 of the locking mechanism 170, which may temporarily retract due to the force of the lower edge of the shaft 107 on the curved surface of the pin 171. Once the flat edge of the notch clears the flat edge of the pin 171, however, the pin 171 may spring back and lock the shaft 107 within the main body 110. The pin 171 may retract and spring back be-

cause it may be spring-loaded by a bias member. Alternatively, the pin 171 may only retract and unretract if the key 150 is used to unlock and lock the locking mechanism 170. Also, the pin 171 and notch within the second shaft 107 may be different than as described above. In general, any configuration may be used that releasably secures the second shaft 107 of the shackle 105 to the main body 110 of the lock 100 via the locking mechanism 170.

[0020] Fig. 2 also shows a cross-section of a key 150 that may be used in conjunction with the main body 110 and shackle 105 of the lock 100 described above. As shown in Fig. 2, the key's blade 157 may be metal or any other suitably rigid material, and the metal may extend to the core portion of the base 155 of the key 150. The base portion 155 of the key 150 may have a plastic or rubber covering 156 that is formed to allow the base portion 155 of the key 150 to engage the connecting link portion 108 of the shackle 105.

[0021] Fig. 3A shows a partial cross-section view of the lock 100 of Fig. 1, as viewed along line 3-3 in Fig. 2. Specifically, a cross-section is shown for the connecting link 108 of the shackle 105, the key 150, and the notch portion 112 of the main body 110 of the lock 100. The remainder of the main body 110 is not shown in cross-section.

[0022] As shown in Fig. 3A, the length L2 of the key 150 may be greater than a first distance L1 between the connecting link 108 of the shackle 105 and the first surface 111 of the main body 110, and the length L2 of the key 150 may be less than a second distance L3 between the connecting link 108 of the shackle 105 and the notch 112 within the main body 110. More specifically, in the particular embodiment shown in Fig. 3A, the length L2 of the key 150 may be greater than the distance L1 between the lowest point of the surface of the connecting link 108 closest to the main body 110 and the first surface 111 of the main body, but the length L2 of the key 150 may be less than a second distance L3 between the point at which the key 150 engages with the shackle 105 and the bottom of the notch 112 within the main body 110. Also, as shown in Fig. 3A, the width W1 of the blade 157 of the key 150 may be less than the width W2 of the notch 112. Alternatively, the width W1 of the blade 157 of the key 150 may be the same as the width W2 of the notch 112.

[0023] Still with reference to Fig. 3A, the key 150 may be metal, with plastic covering the bow or base portion 155 of the key. Specifically, the metal comprising the blade 157 and the base 155 may not extend the entire length L2 of the key 150, as shown in Fig. 3A. Instead, as shown in Fig. 3A, plastic 156 may cover part of the base portion 155 of the key 150 and the edge or rim of the base portion 155 may be shaped so as to engage the connecting link 108 of the shackle 105. Although many shapes of the connecting link 108 of the shackle 105 and the plastic (or other) covering for the base portion 155 of the key 150 are possible, the embodiment shown in Fig. 3A shows a connecting link 108 with at least a portion of the outer surface being generally convex, and a rim or edge of the base portion 155 of the key 150 with a generally concave outer surface that generally matches the shape of the convex outer surface of the shackle 105 when viewed in cross section. The cross section of the connecting link 108 along the length of the connecting link 108 may be generally circular or round, and the perimeter edge of at least the portion of the base portion 155 that engages the shackle 105 may be generally a "U" shaped channel or trough or the like. In other words, the shackle 105 may have a concave outer surface along the portion of the shackle that engages the key 150, while the key 150 may have a convex outer surface along the portion of the key 150 that engages the shackle 105, such that the surfaces that engage match or otherwise correspond to each other.

[0024] As discussed above, the entire length L2 of the key 150 (the blade 157 and the base portion 155, including the perimeter edges of the covering on the base portion 155) may be greater than the distance L1 between the first surface 111 of the main body 110 and the portion of the connecting link 108 closest to the main body 110, but may be less than the distance L3 between the bottom of the notch 112 and the point at which the perimeter edge of the base portion 155 of the key 150 engages with the connecting link 108 of the shackle 105. In the embodiment shown in Fig. 3A, the perimeter edges of the base portion 155 may extend far enough up the arc of the shackle 105 when the blade 157 of the key 150 is placed within the notch 112 on the main body 110, such that the key 150 may sufficiently engage the shackle to resist lateral forces applied to the key below a predetermined threshold to maintain securement of the key in the lock, while also allowing for lateral forces applied to the key above the predetermined threshold to release the key from the shackle.

[0025] Alternatively, the connecting link 108 may be round and concave, while the plastic base portion 155 of the key 150 may be round and convex. Or, the connecting link 108 may be a convex triangular shape, while the base portion 155 of the key 150 is round and concave. Many other alternative embodiments exist. Many other shapes and configurations are possible, some but not all of which are shown in Figs. 3B to 3F. In Fig 3B, the cross section of the connecting link 108 along the length of the connecting link 108 may be only partially rounded and convex (along that portion that engages the key 150), and the perimeter edge of at least the portion of the base portion 155 that engages the shackle 105 may be generally a "U" shaped channel or trough or the like. In Fig. 3C, the cross section of the connecting link 108 along the length of the connecting link 108 may be at least partially triangular and convex (along that portion that engages the key 150), and the perimeter edge of at least the portion off the base portion 155 that engages the shackle 105 may be generally a "U" shaped channel or trough or the like.

[0026] In Fig. 3D, the cross section of the connecting

link 108 along the length of the connecting link 108 may be partially rounded and concave, forming a "U" shape, while the perimeter edge of at least the portion of the base portion 155 that engages the shackle 105 may be generally round and convex. In Fig. 3E, the cross section of the connecting link 108 has two rounded sides - a convex rounded side on the portion that does not engage the base portion 155 of the key 150, and a concave rounded side on the portion that does engage the base portion 155 of the key 150. The perimeter edge of at least the portion of the base portion 155 that engages the shackle 105 may generally be a convex triangular shape. In Fig. 3F, the cross section of the connecting link 108 may be convex and rounded on the portion that does not engage the base portion 155 of the key 150, and a concave triangular shape on the portion that does engage the base portion 155 of the key 150, while the perimeter edge of at least the portion of the base portion 155 that engages the shackle 105 may generally be a convex triangular shape.

[0027] Many other configurations are possible. Regardless of which configuration is used, only the portion of the connecting link 108 and key 150 that engage with one another needs to be shaped in a particular way. Thus depending on the configuration of the connecting link 108 and the base portion 155 of the key 150, the distances L1, L2, and L3discussed above may be slightly different.

[0028] Figs. 4A through 4D show the key 150 in various positions relative to the lock 100. Specifically, Fig. 4A shows the key 150 stored between the shackle 105 and the notch 112 within the main body 110 of the lock 100. When the key 150 is placed between the shackle 105 and the notch 112, the length of the key 150 in relation to the other components of the lock 100 in conjunction with a friction force between the shackle 105 and the key 150 may prevent the key 150 from falling out, and effectively store the key 150. The friction force, however, may be overcome, as shown in Fig. 4B, which demonstrates a force F (designated by an arrow) being applied to the key 150. Fig. 4C shows the key 150 separated from the lock 100. The configuration of the connecting link 108 and the base portion 155 of the key 150 may facilitate removing the key 150 from the lock 100. For example, in some embodiments and as described above, the perimeter edges of the base portion 155 of the key 150 may extend far enough up the arc of the connecting link 108 of the shackle 105 when the blade 157 of the key 150 is placed within the notch 112 on the main body 110 so that the key 150 is releasably secured to the lock 100 by the friction force between the key 150 and the shackle 105. The edges may, however, not extend so far up the arc of the connecting link 108 of the shackle 105 that a force F above a given or predetermined threshold cannot overcome the friction force to remove the key 150 from its stored configuration.

[0029] Fig. 4D shows the key 150 positioned to be placed into the locking mechanism 170 of the lock 100. The locking mechanism 170 may include several parts. As described above, the locking mechanism 170 may include a pin 171 that selectively engages the second shaft 107 of the shackle 105. The pin 171 may be retracted and unretracted using the key 150. The locking mechanism 170 may further include pins, wafers, tumblers, and such that may be arranged in a cylindrical compartment 172 into which the key 150 may be placed, and the various grooves and bittings of the blade of the key may engage with the pins, wafers, tumblers, etc. to allow the pin 171 to be selectively disengaged from the shackle 105. In general, any type of locking mechanism 170 may be used, such as an integrated or modular locking mechanism 170. Also, the locking mechanism 170 may be able to be unlocked using a master key 150. For example, in luggage lock embodiments, the locking mechanism 170 may be able to be unlocked by a government key 150, such as a Transportation Security
Administration (TSA) key in the United States, or any other regional, national, or global security agency. In some embodiments, the locking mechanism 170 may be configured to be unlocked by two or more means. For example, the locking mechanism 170 may be configured to be unlocked using the key 150, as well as a combination lock (not shown).

[0030] Figs. 5A through 5D show one embodiment of how the lock 100 and key 150 described above may be operated. In Fig. 5A, the key 150 is placed within the locking mechanism 170 and rotated to retract the pin 171 of the locking mechanism 170, and thereby release the second shaft 107 of the shackle 105 from the main body 110 of the lock 100. As described above, the first shaft 106 may be permanently, rotatably and telescopically coupled to the main body 110. As such when the second shaft 107 is released from the main body 110 of the lock 100, the shackle 105 may telescope around the first shaft 106, relative to the main body 110. In Fig. 5b, the second shaft 107 is shown released from the main body 110. The key 150 may then be removed from the locking mechanism 170. Fig. 5C shows the key 150 positioned within the notch 112 on the first surface
111 of the main body 110, and a force F (designated by an arrow) being applied to the shackle 105. If the key 150 is properly aligned within the notch 112 and the shackle 105 when the force F is applied such that the second shaft 107 of the shackle 105 re-enters the main body 110 and is engaged with the pin 171 of the locking mechanism 170, the shackle 105 may engage the base portion 155 of the key 150, and the key 150 may be stored between the shackle 105 and the notch
112 in the main body 110 due to a friction force. Fig. 5D shows the key 150 in a stored position between the shackle 105 and the notch 112 within the main body 110. Alternatively, the key 150 may be positioned within the shackle 105 and notch 112 of the main body 110 even when the second shaft 107 of the shackle 105 is secured within the main body 110. The blade portion 157 of the key 150 may be placed in the notch 112 within the main body 110, and a force F may be applied to overcome the

friction between the base portion 155 of the key 150 and the shackle 105, so that the base portion 155 of the key 150 engages with the connecting link 108 of the shackle 105.

[0031] A variety of embodiments and variations of structures and methods are disclosed herein. Where appropriate, common reference numbers and words were used for common structural and method features. However, unique reference numbers and words were sometimes used for similar or the same structural or method elements for descriptive purposes. As such, the use of common or different reference numbers or words for similar or the same structural or method elements is not intended to imply a similarity or difference beyond that described herein.

[0032] References to "front," "middle," "rear," "back," "upper," "lower," "top," "bottom," "side," as well as any other relative positional or directional descriptor are given by way of example to aid the reader's understanding of the particular embodiment(s) described. They should not be read to be requirements or limitations, particularly as to the position, orientation, or use of the invention unless specifically set forth in the claims. Connection references (e.g. attached, coupled, connected, joined, and the like) are to be construed broadly and may include intermediate members between a connection of elements and relative movement between elements. As such, connection references do not necessarily infer that two elements are directly connected and in fixed relation to each other, unless specifically set forth in the claims. In some instances, components are described with reference to "ends" having a particular characteristic or being connected with another part. Those skilled in the art will recognize that the disclosed embodiments are not limited to components which terminate immediately beyond their points of connection with other parts.

[0033] The apparatus and associated method in accordance with the present invention has been described with reference to particular embodiments thereof. Therefore, the above description is by way of illustration and not by way of limitation. Accordingly, it is intended that all such alterations, variations, and modifications of the embodiments are within the scope of the present invention as defined by the appended claims. In methodologies directly or indirectly set forth herein, various steps and operations are described in one possible order of operation, but those skilled in the art will recognize that steps and operations may be rearranged, replaced, or eliminated without necessarily departing from the scope of the disclosed embodiments.

Claims

1. A lock, comprising:

a main body with a notch configured to receive a first portion of a key;

a shackle movably coupled to the main body and configured to engage a second portion of the key; and

the shackle and notch further configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

2. The lock of claim 1, further comprising the key.

3. The lock of claim 2, wherein the length of the key is greater than a first distance between the shackle and the main body when the shackle is positioned in a locked configuration, and the length of the key is less than a second distance between the shackle and the notch when the shackle is positioned in the locked configuration.

4. The lock of claim 2, wherein the key is positioned between the notch and the shackle when secured to the lock using the shackle and the notch.

5. The lock of claims 2, 3 or 4, wherein the second portion of the key comprises a base portion.

6. The lock of claim 5, wherein the base portion of the key is cylindrical shaped.

7. The lock of claim 5 or 6, wherein at least a portion of a perimeter edge of the base portion of the key is convex and at least a portion of an outer surface of the shackle is concave.

8. The lock of claim 5 or 6, wherein at least a portion of a perimeter edge of the base portion of the key is concave and at least a portion of an outer surface of the shackle is convex.

9. The lock of claim 8, wherein the at least a portion of the perimeter edge of the base portion of the key is "U" shaped so as to defme a channel, and a cross section of the shackle along the shackle length is at least partially round so as to be configured to engage the "U" shaped perimeter edge of the base portion of the key.

10. The lock of claims 5, 6, 7, 8 or 9, wherein the base portion is at least partially plastic.

11. The lock of claim 10, wherein the at least partially plastic base portion is over-molded onto metal.

12. The lock of any of the preceding claims, wherein the main body further comprises a locking mechanism configured to receive the first portion of the key and to selectively engage at least a portion of the shackle to the main body.

13. The lock of any of the preceding claims, wherein the second portion of the key is distal from the first portion of the key.

14. A method of manufacturing a lock, the method comprising the act of: joining
a shackle with a main body; and
forming a notch in the main body;
wherein the notch is configured to receive a first portion of a key, the shackle is shaped to engage a second portion of the key, and the shackle and notch are configured to releasably secure the key to the lock when the first portion of the key is received within the notch and the second portion of the key is engaged with the shackle.

15. The method of claim 14, further comprising forming the key.

16. The method of claim 15, wherein the length of the key is greater than a first distance between the shackle and the main body when the shackle is positioned in a locked configuration, and the length of the key is less than a second distance between the shackle and the notch when the shackle is positioned in the locked configuration.

17. The method of claim 16 wherein the key is positioned between the notch and the shackle when secured to the lock using the shackle and the notch.

18. The method of claim 15, 16, or 17, wherein the second portion of the key comprises a base portion.

19. The method of claim 18, wherein the base portion of the key is cylindrical shaped.

20. The method of claim 18 or 19, wherein at least a portion of a perimeter edge of the base portion of the key is convex and at least a portion of the outer surface of the shackle is concave.

21. The method of claim 18 or 19, wherein at least a portion of a perimeter edge of the base portion of the key is concave and at least a portion of an outer surface of the shackle is convex.

22. The method of claim 21, wherein the at least a portion of the perimeter edge of the base portion of the key is "U" shaped so as to define a channel, and a cross section of the shackle along the shackle length is at least partially round so as to be configured to engage the "U" shaped perimeter edge of the base portion of the key.

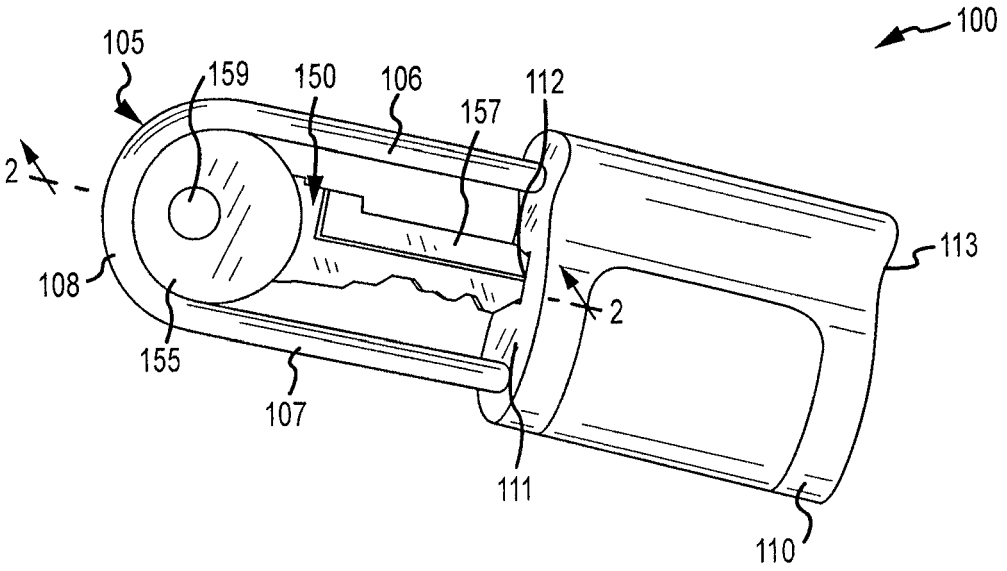
23. The method of claims 18, 19, 20, 21 or 22, wherein the base portion is at least partially plastic.

24. The method of claim 23, wherein the at least partially plastic base portion is over-molded onto metal.

25. The method of any of the preceding claims, wherein the main body further comprises a locking mechanism configured to receive the first portion of the key and to selectively engage at least a portion of the shackle to the main body.

26. A lock, comprising:

a main body with a first surface;
a notch on the first surface of the main body;
a shackle extending from the first surface of the main body, the shackle including a pair of spaced apart, substantially linear portions;
the notch positioned between the substantially linear portions of the shackle on the first surface and configured to receive a first portion of a key;
and the shackle configured to engage a second portion of the key.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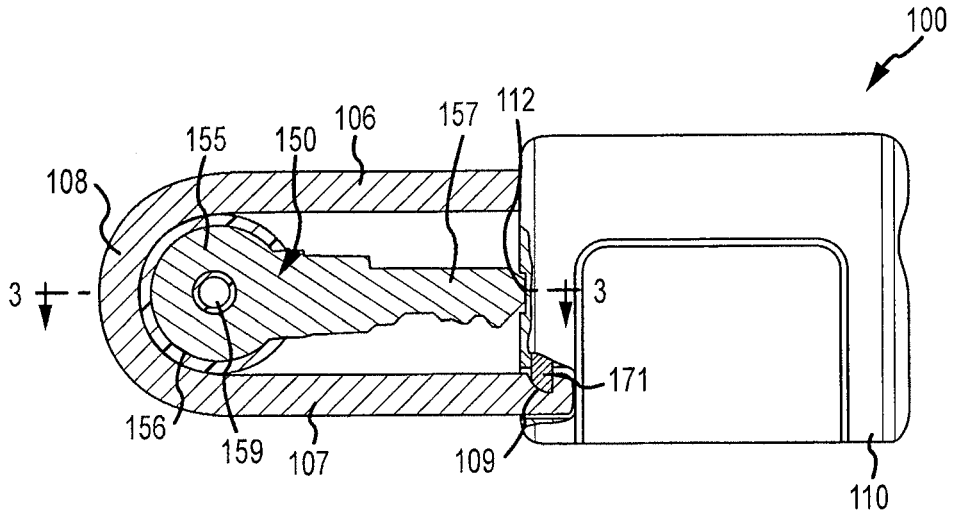
105
159
150
106
112
157
2
108
155
107
111
110
113
2

FIG.1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155
150
106
157
112
108
3
3
171
156
159
107
109
110

FIG.2

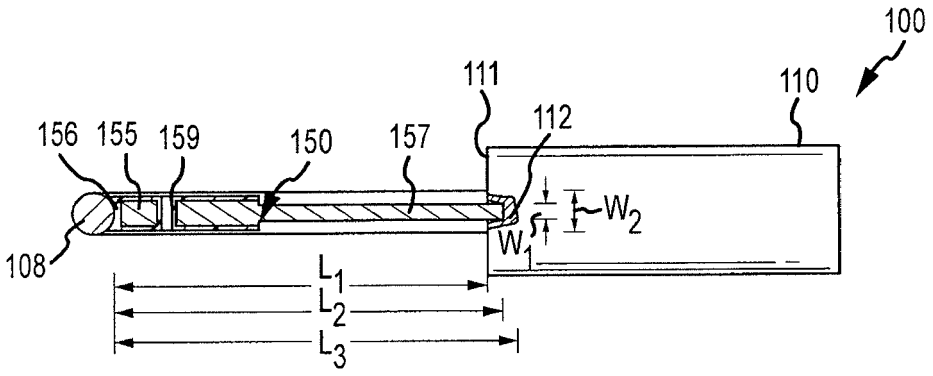

FIG.3A

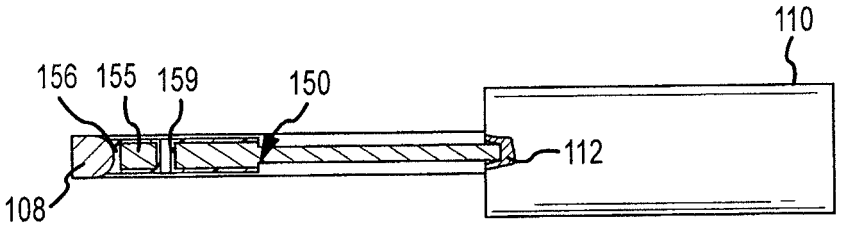

FIG.3B

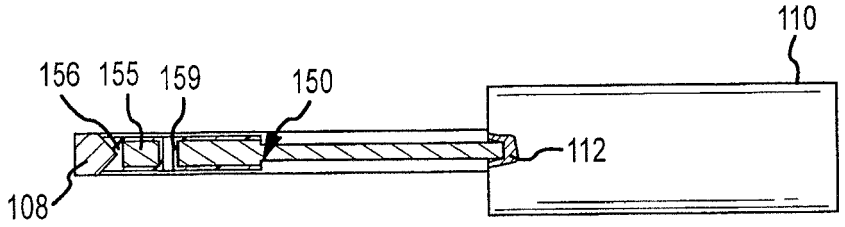

FIG.3C

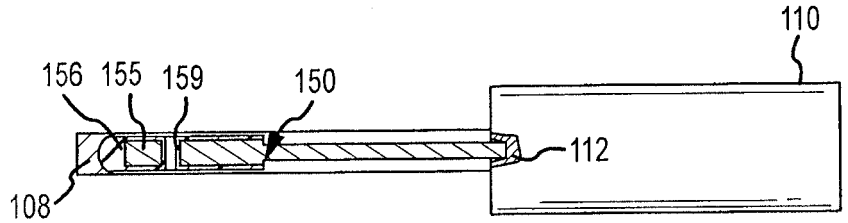

FIG.3D

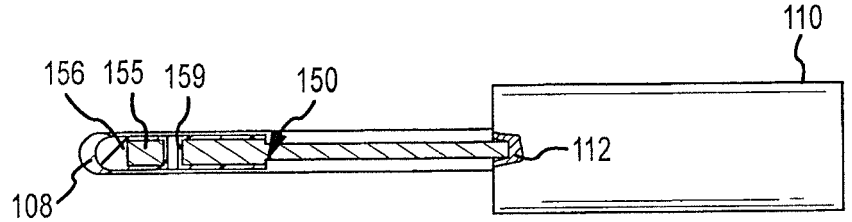

FIG.3E

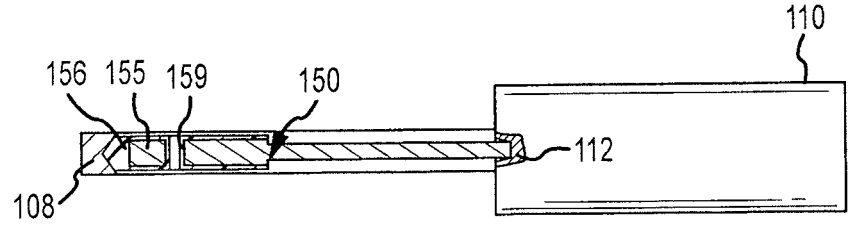

FIG.3F

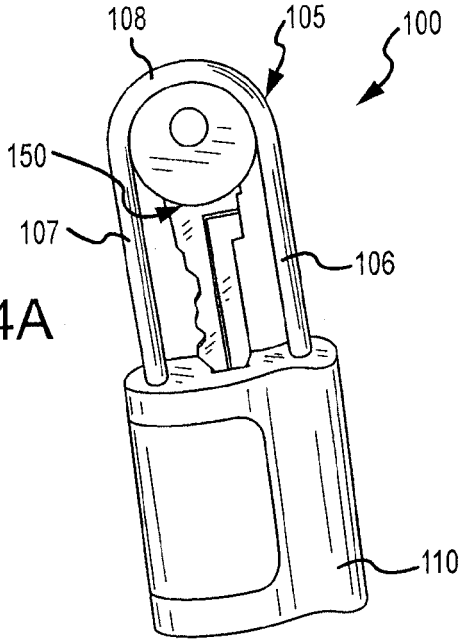

FIG.4A

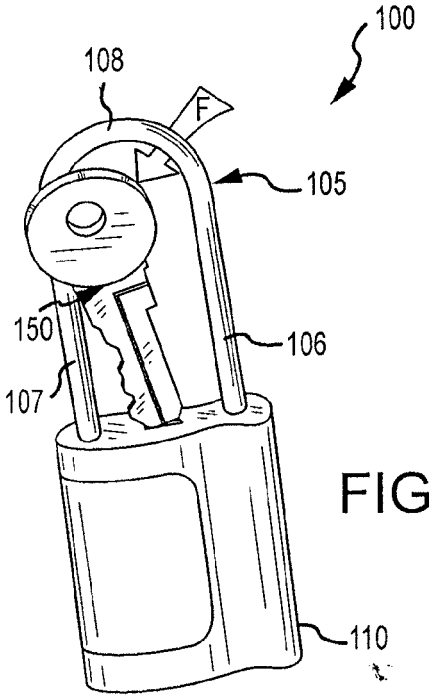

FIG.4B

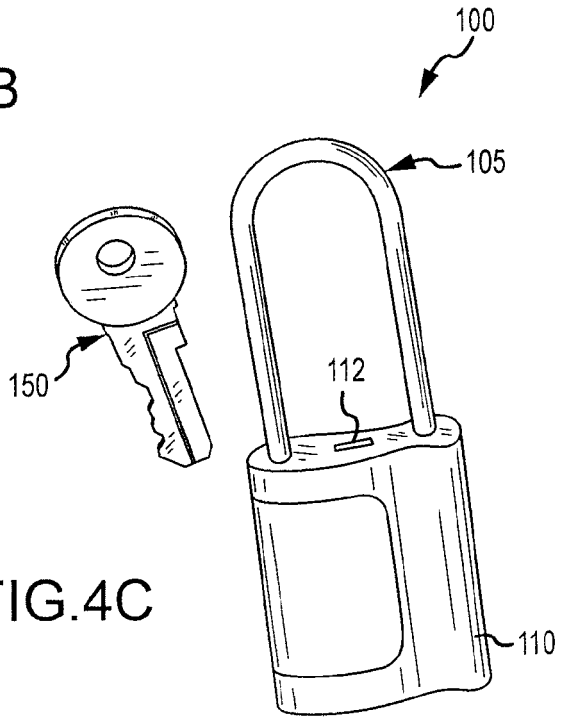

FIG.4C

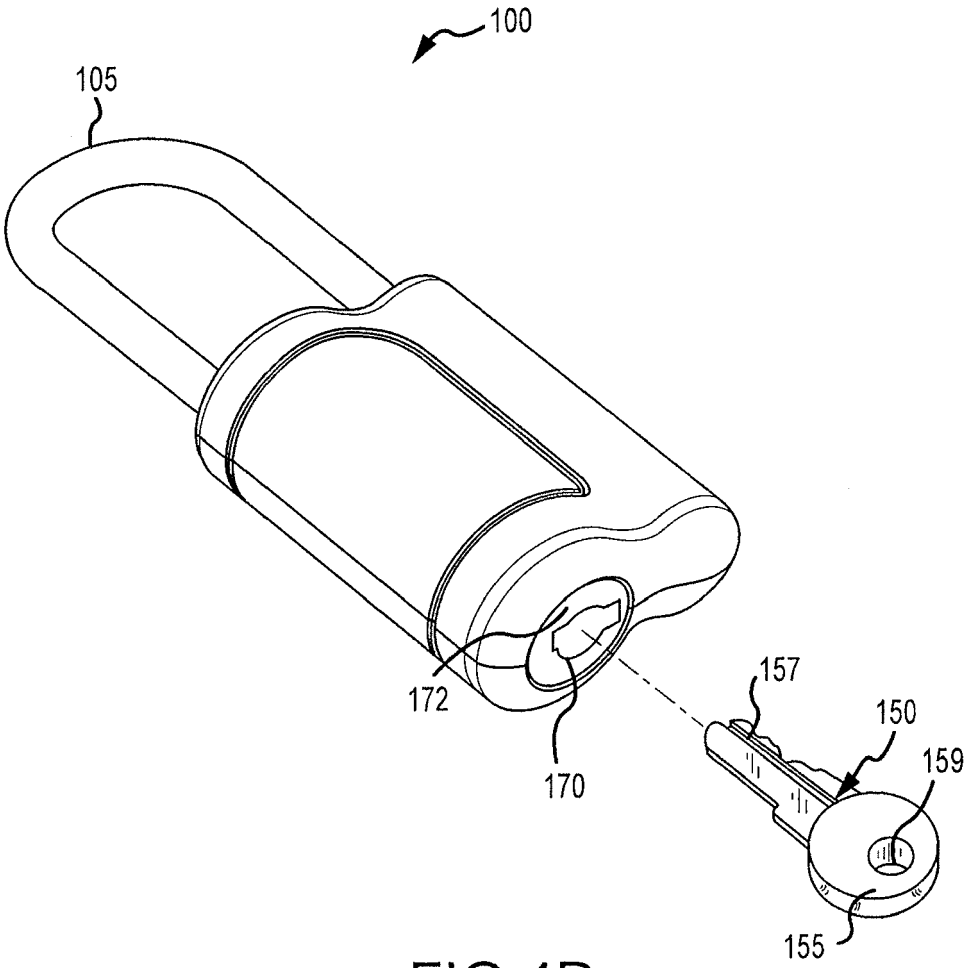

FIG.4D

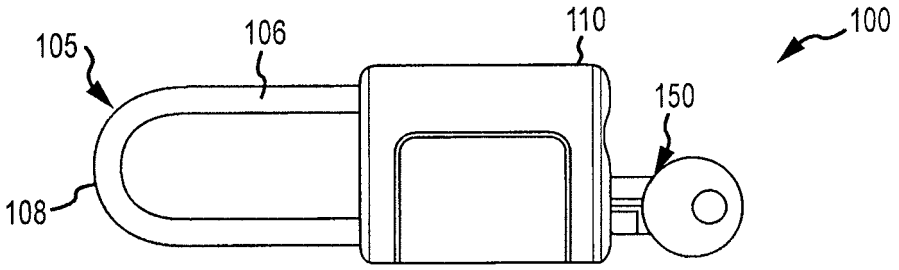

FIG.5A

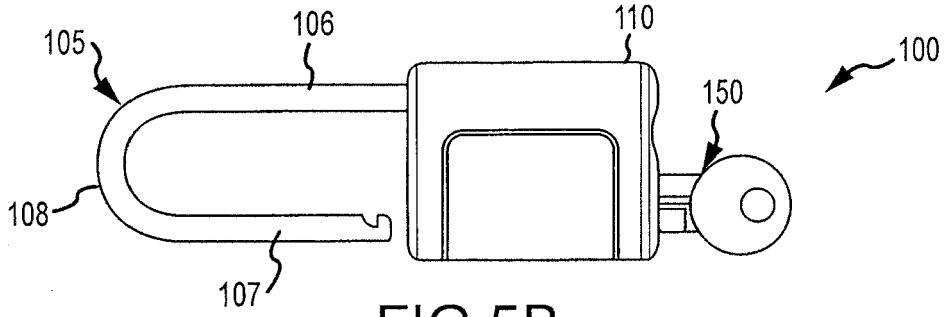

FIG.5B

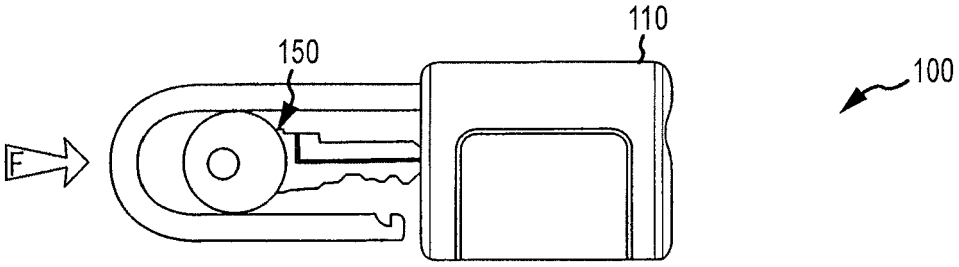

FIG.5C

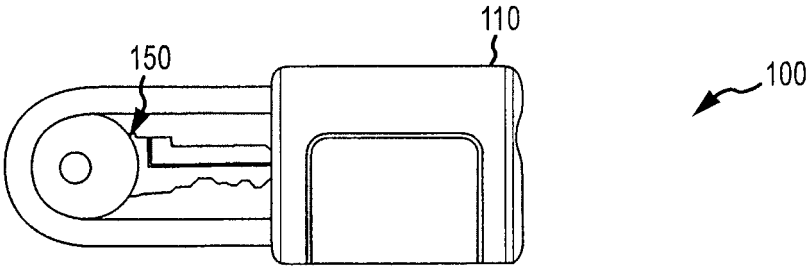

FIG.5D

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EUROPEAN SEARCH REPORT

Application Number
EP 11 16 2519

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	LU 78 043 A1 (JOSEPH YALE PELAVIN) 11 January 1978 (1978-01-11) * page 3 - page 5; figures 1-6 *	1,12,14, 25,26 2,15	INV. E05B19/00 E05B67/02 E05B67/06
X	DE 512 624 C (GUSTAV DANNERT FA) 15 November 1930 (1930-11-15) * the whole document *	1,12,14, 25,26	E05B19/04 E05B67/24
A	WO 2006/075248 A2 (TRUSS DAVID ADAM [CA]) 20 July 2006 (2006-07-20) * page 43, line 1300 - page 44, line 1324; figure 14 *	1,7,8,14	
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E05B
A47G
A44B
A45C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 November 2011	Ansel, Yannick

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