

TITLE: Safe deposit box

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SAFE DEPOSIT BOX

The present invention relates to a safe deposit box. More specifically, the invention relates to a safe deposit box comprising a cabinet body, wherein the cabinet body is stackable into a similar cabinet. The invention also relates to a method for providing said safe deposit box to a place of mounting.

Modular safe deposit boxes that can be assembled at the place of mounting is an advantage with regards to transportation and manual handling. Safe deposit boxes are often installed in a closet or in a wall. Lifting the safe into place may be a challenge if the safe is heavy.

In hotels, it is common to have a safe deposit box in each room. Banks and postal offices typically also holds a quantity of deposit boxes for their customers to store e.g. valuables. Transporting a large quantity of safes can be a challenge as they occupy a lot of space if pre-assembled. There are several solutions in the prior art that disclose various modular safe deposit boxes, so called "flat packed" safes. A common feature with most of these is that they constitute several parts, e.g. side walls, top, bottom, rear and a door. Assembling such a safe may be time consuming.

Patent document US1467419 discloses a safe comprising a plurality of nested frames clamped together between a rear wall and a front frame to form the body of the safe. The front frame is arranged to receive a metal frame, and with it the door of the safe. The metal frame is connected either to a complete box which fills up the interior of the safe, or to straps, which like the box, can be secured to bolts in the rear wall.

Patent document WO9105128 discloses a safe formed of sections of sheet material to which an outer and an inner body casing of sheet material are connected. A door frame, also formed of sheet material, defines a door inner space. A door is hung in the safe body and seals around the inner portion of the door frame.

In safes, according to the prior art mentioned above, the cabinet may be assembled at the place of mounting, prior to connecting the door. As the cabinet constitute several parts it makes the assembly process time consuming. Further, safes of the prior art are casted in steel, either solid parts or sheet metal. Parts made from sheet metal often have an internal void which can be filled with for example concrete. The density of both steel and concrete makes the safes heavy.

Patent document NO19994872 discloses a travel safe comprising a casing and a lid. The lid may be locked to the casing with a conventional lock, such as a bike lock or similar. The casing and the lid has holes that align when the lid is arranged on the casing, the holes forming a through-hole configured to receive the lock. The safe is of a size that makes it convenient to bring along on a trip. The safe may be connected to a fixed object by means of the lock. The safe is of a shape that does not allow for stacking of several casings inside each other.

Patent document US20150000571 discloses a portable lock box having a stackable bin and hangers for connection to various elements, such as a beach chair. The bin may be covered by a lid. The bin and lid may be slid into a lid frame and locked to the lid frame by a removable locking mechanism. The lid frame may be connected to various elements, such as beach chair, such that steeling the lock box is made more difficult.

Safes according the prior art mentioned above are intended for portable use.

It is an object of the invention to provide a safe deposit box in which the assembly time is limited, where, at the same time, the weight of the cabinet body is kept low. It is also an object of the invention to provide a safe deposit box in which a plurality of cabinets is stackable into each other to reduce the space it occupies during transport. It is a further objective of the invention to provide a safe deposit box that is easy to install in a building structure, such as a wall.

The invention has for its general object to remedy or to reduce at least one of the drawbacks of the prior art, or at least provide a useful alternative to prior art.

The object is achieved through features, which are specified in the description below and in the claims that follow.

The invention is defined by the independent patent claims. The dependent claims define advantageous embodiments of the invention.

More specifically, the invention relates to a safe deposit box for stationary mounting in or on a structure such as a wall or furniture, wherein the safe deposit box comprises:

- a cabinet forming a rear portion and a front portion having an opening, the cabinet being configured for internal fastening to the structure;
- a frame;
- a closing device connectable to the frame for closing the opening, the closing device being provided with a locking mechanism, wherein the opening forms a larger area than the rear portion for stacking another similar cabinet into the cabinet.

The term safe deposit box should not be considered limiting in any way. Other definitions could be safe (such as an in-room safe or hotel safe), deposit box or secured container.

The invention has the effect that several cabinets may be stacked into each other during transport such that they occupy less space.

In one embodiment, the frame may be an integrated part of the cabinet. An integrated part should be understood as the cabinet and the frame being formed from one and the same piece of material.

5 This has the effect that the cabinet and the frame may be casted in one mould and in one operation. This may further reduce fabrication time and fabrication cost.

In one embodiment, the frame may be connectable to the cabinet. The effect of having a connectable frame is that the frame may be connected whenever desired, such as after the cabinet has been mounted in the building structure. Thus, the cabinet may be mounted independently of the
10 frame. This has the further effect that the cabinet takes up even less space during transport.

In one embodiment, the frame may comprise a snap lock, the snap lock having a pointed part projecting backwards from an endpoint for connecting the frame to the cabinet. It should be understood that the frame may comprise a plurality of snap locks. The snap lock may be complementary to an edge around the opening of the cabinet. With the cabinet and frame assembled, the snap
15 lock may abut against said edge. Thus, the frame may not be dismounted from the cabinet without displacing the snap lock to release it from the edge. The effect of using a snap lock to connect A snap lock may be a quick way to assemble the safe deposit box.

In one embodiment, the frame may be connected to the cabinet by means of screws. The cabinet and the frame may be arranged with holes that align when the door frame is mounted correctly on
20 the cabinet. It should be understood that other means similar to a screw, such as a bolt, may be used instead of a screw. The holes may be threaded, wherein the threads are complementary to threads on the screw. The head of the screw may be arranged inside the safe deposit box. In another embodiment, the head of the screw can be arranged on the outside of the safe deposit box. The screw has the effect that the door frame may be disassembled from the cabinet using standard
25 tools.

In one embodiment, the frame may be connected to the cabinet by means of a weld, for example a fusion weld such as a solid-reactant weld.

In one embodiment, the cabinet may be tapered from the front portion towards the rear portion. A tapered cabinet has the effect that it eases stacking of several cabinets.

30 In one embodiment, the closing device may be a hinged door. The effect of having a hinged door is that it allows for easy opening of the safe. In one embodiment, the closing device may be a drawer. The drawer may be slideable in and out of the cabinet.

In one embodiment, the safe deposit box may comprise means for fixing the safe deposit box in the hole in the building structure. Fixing the safe deposit box in the hole has the effect that the safe

may not be removed from its as-installed location. In one embodiment, the safe may for example be bolted, welded or casted to the building structure.

In one embodiment, the safe deposit box may be made from a composite material. A composite material may for example be a fibre-reinforced polymer (FRP), such as carbon-FRP, glass-FRP or
 5 aramid-FRP. A composite material may reduce the weight of the safe, as compared to steel, thus making it easier to manually handle.

In one embodiment, the cabinet may be casted as one unit. Casting the cabinet as one unit may simplify the production process and save costs. The cabinet may not have any joints between parts that may constitute a structural weak-spot.

10 In one embodiment, the locking mechanism may be permanently attached to the closing device. Permanently attaching the locking mechanism to the closing device may make the safe deposit box robust and resistant to forced entry. It may also reduce the assembly time of the safe deposit box.

In one embodiment, the locking mechanism may be provided with at least one locking dog, such as a pin bolt, configured to interface with the frame for locking the safe deposit box. The locking dog
 15 may be projected from or retracted into the closing device. The locking dogs may be arranged around a perimeter of the closing device. In one embodiment, the locking dogs may interface with complementary receptacles on the frame.

In the following is described examples of preferred embodiments illustrated in the accompanying drawings, wherein:

- 20 Fig. 1 shows a safe deposit box according to one embodiment of the invention, wherein a door frame is connectable to a cabinet;
- Fig. 2a shows, in a larger scale than figure 1, a cross-sectional area of a side wall of the cabinet and the door frame in figure 1, in a pre-assembled state;
- Fig. 2b shows, in the same scale as figure 2a, the door frame connected to the cabinet body;
- 25 Fig. 3a-b shows, in the same scale as figure 2a, two different embodiments of the connection between the cabinet and door frame;
- Fig. 4 shows a plurality of cabinets stacked into each other, and
- Fig. 5 shows a cross section of a safe deposit box according to another embodiment of the invention, wherein a frame is an integrated part of the cabinet.

30 In the following, the reference number 1 will indicate a safe deposit box according to the present invention. Identical reference numerals will indicate identical or similar features in the drawings.

The drawings are simplified and schematic, and the various features in the drawings are not necessarily drawn to scale.

Figure 1 shows a cabinet 2 and a door section 3, the door section 3 comprising a frame 31, a door frame in this particular embodiment, and a closing device 32, a door in this particular embodiment.

5 The door 32 comprises a locking mechanism 320 provided with a control module 321 for operating the locking mechanism 320. The control module 321 has a set of numeric keys 322 and a digital display 323. The door 32 is hinged (not shown) to the door frame 31. The door 32 is locked to the door frame 31 by locking dogs (not shown).

10 The cabinet 2 is casted as one structural part. The cabinet 2 is tapered from a front portion 22 towards a rear portion 21. The front portion 22 is provided with an opening 23. An area and shape of the opening 23 is such that the rear portion 21 of a first cabinet 2 may be guided into the opening 23 of a second cabinet 2 for stacking several cabinets 2 into each other. The frame 31 in this particular embodiment is connectable to the cabinet 2 around the opening 23.

Figure 2a shows a cross-sectional area of the cabinet 2, the frame 31 and the door 32 in figure 1.

15 The frame 31 is provided with a snap lock 4 having a pointed part 41 projecting backwards from an end point 42. An inner surface 221 of the opening 23 is complementary to the snap lock 4. During assembly, an angled surface 43 between the end point 42 and the pointed part 41 will abut against an edge 231 of the cabinet 2 around opening 23.

Figure 2b shows the same cross-sectional area as in figure 2a, but with the cabinet 2 and the frame 31 connected. Assembling the cabinet 2 and the frame 31 may be done by pushing the frame 31 towards the cabinet 22. The snap lock 4 may bend inwards as the angled surface 43 slides against the edge 231 of the cabinet 2. Once the pointed part 41 passes the inner surface 221 of the opening, the snap lock 4 will snap back to its initial position, thus the pointed part 41 abut against the inner surface 221 and affixes the frame 31 to the cabinet 2.

25 The snap lock 4 is dis-connectable only from inside the safe deposit box 1. By means of a tool (not shown) the snap lock 4 may be bent inwards to release the frame 31 from the cabinet 2.

Figure 3a shows an alternative connection between the cabinet 2 and the frame 31, wherein a screw 51 affixes the frame 31 to the cabinet 2. In this particular embodiment, a head 510 of the screw 51 is facing outwards. In another embodiment, the head 510 of the screw 51 may be facing inwards. The cabinet 2 and the frame 31 are provided with holes 233, 311 for receiving the screw 51. The holes 233, 311 align when the frame 31 is mounted in a correct position onto the cabinet 2. The screw 51 may be threaded (not shown), the threads being complementary to threads (not shown) in the holes 233, 311 on the frame 31 and/or the cabinet 2.

35 Figure 3b shows a second alternative connection between the cabinet 2 and the frame 31, wherein a weld 61 connects the frame 31 to the cabinet 2. The weld 61 may be a fusion weld, such as a

solid-reactant weld.

Figure 4 shows a plurality of cabinets 2 stacked into each other. The figure should not be interpreted as to restrict the number of cabinets 2 that may be stacked.

Figure 5 shows the safe deposit box 1 wherein the frame 31 is an integrated part of the cabinet 2.

5 The frame 31 and the cabinet 2 is casted from the same structural element. In this particular embodiment, the frame 31 is arranged externally of the cabinet 2. The frame 31 forms a circumference being larger than a circumference of the cabinet 2.

Figure 5 further shows that the safe deposit box 1 is mounted in a structure 7, in this case a wall.

10 The safe deposit box 1 is shown to be mounted in a hole 70 in the wall 7. A width (W) of the hole 70 is larger than a width (w1) of the cabinet 2. The width (W) of the hole 70 is smaller than a width (w2) of the frame 31. The relationship between the width of the hole 70, the cabinet 2 and the frame 31 is also applicable for a height of the respective elements. The relationship may be the same for any shape of the safe 1 and the corresponding hole 70. For a person (not shown) looking at the wall 7, the frame 31 covers a circumference of the hole 70. Thus, the frame 31 may form a
15 nice finish around the safe 1, not requiring any supplementary work to hide the hole 70 after mounting the safe 1.

The cabinet 2 is shown to be configured for internal fastening to the wall 7 by means of two bolts 8.

The cabinet 2 is also provided with two holes 80 in a bottom 24 of the cabinet 2. The holes 80 may be used to fix the safe 1 by bolts to a structure, e.g. a furniture, which the safe is placed on top of. It
20 should be noted that the number of bolts 8 may be different from two in another embodiment

The frame 31 further forms an alignment surface 311. The alignment surface 311 may abut against the wall 7 during installation, such that the safe 1 is installed at a correct depth within the hole 70.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between
25 parentheses shall not be construed as limiting the claim. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

30 The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

C l a i m s

1. A safe deposit box (1) for stationary mounting in or on a structure (7) such as a wall or furniture, wherein the safe deposit box (1) comprises:
 - a cabinet (2) forming a rear portion (21) and a front portion (22) having an opening (23),
 5 the cabinet (2) being configured for internal fastening to the structure (7);
 - a frame (31);
 - a closing device (32) connectable to the frame (31) for closing the opening (23), the closing device (32) being provided with a locking mechanism (320),
 c h a r a c t e r i s e d i n that the opening (23) forms a larger area than the
 10 rear portion (21) for stacking another similar cabinet (2) into the cabinet (2).
2. The safe deposit box (1) according to claim 1, wherein the frame (31) is an integrated part of the cabinet (2).
3. The safe deposit box (1) according to claim 1, wherein the frame (31) is connectable to the cabinet (2).
- 15 4. The safe deposit box (1) according to claim 3, wherein the frame (31) comprises a snap lock (4), the snap lock (4) having a pointed part (41) projecting backwards from an end-point (42) for connecting the frame (31) to the cabinet (2).
5. The safe deposit box (1) according to any of the preceding claims, wherein the cabinet (2) is tapered from the front portion (22) towards the rear portion (21).
- 20 6. The safe deposit box (1) according to any of the preceding claims, wherein the closing device (32) is a hinged door.
7. The safe deposit box (1) according to any of the preceding claims, wherein the safe deposit box (1) is made from a composite material.
8. The safe deposit box (1) according to any of the preceding claims, wherein the cabinet (2)
 25 is casted as one unit.
9. The safe deposit box (1) according to any of the preceding claims, wherein the locking mechanism (320) is permanently attached to the closing device (32).
10. The safe deposit box (1) according to any of the preceding claims, wherein the locking mechanism is provided with at least one locking dog, such as a pin bolt, configured to inter-
 30 face with the frame for locking the safe deposit box (1).

A b s t r a c t

It is described a safe deposit box (1) for stationary mounting in or on a structure (7) such as a wall or furniture, wherein the safe deposit box (1) comprises:

- a cabinet (2) forming a rear portion (21) and a front portion (22) having an opening (23), the cabinet (2) being configured for internal fastening to the structure (7);
- a frame (31); and
- a closing device (32) connectable to the frame (31) for closing the opening (23), the closing device (32) being provided with a locking mechanism (320), wherein the opening (23) forms a larger area than the rear portion (21) for stacking another similar cabinet (2) into the cabinet (2).

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(Fig. 1)