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(54) **LOCKING MECHANISM**

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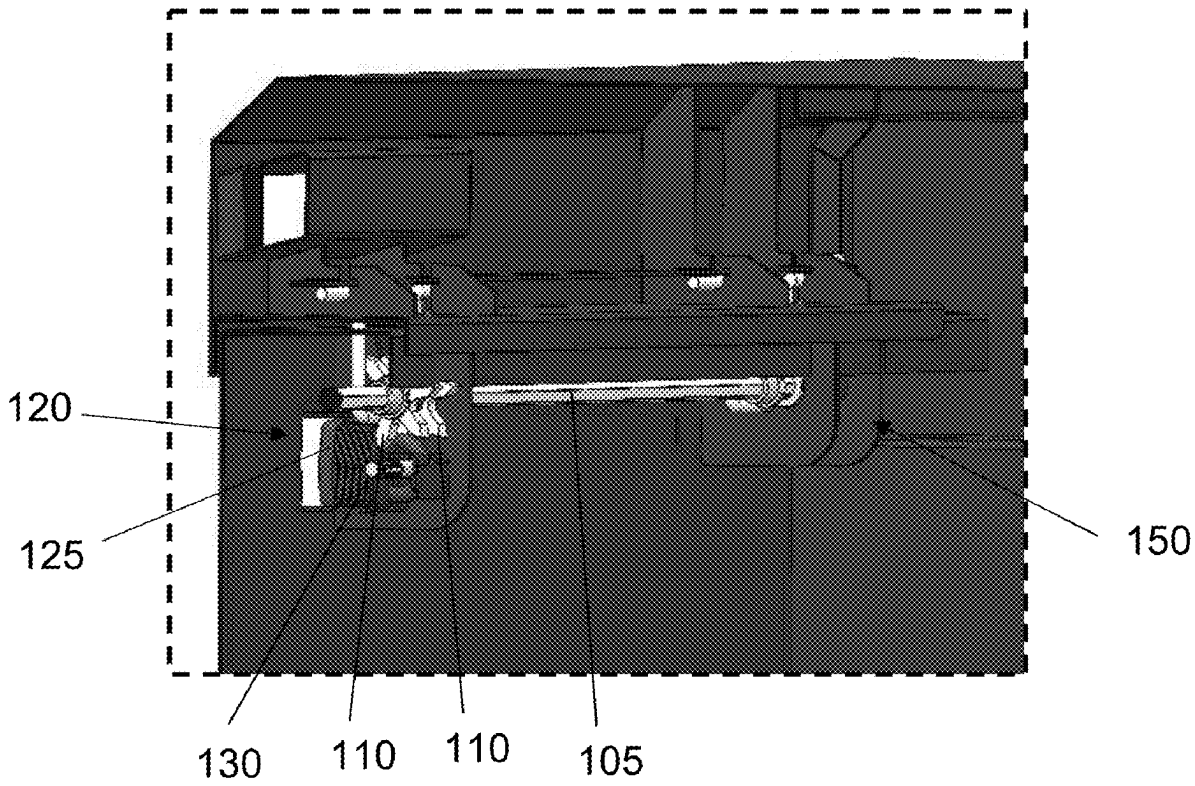
(57) **ABSTRACT**

A locking mechanism is disclosed. The locking mechanism has a rotatable member configured to rotate about its longitudinal axis, at least one primary engaging member fixed to the rotatable member and configured to rotate about the longitudinal axis of the rotatable member, at least one retainable member configured to be retained by the at least one primary engaging member and a blocking member receiving portion located adjacent to the at least one primary engaging member and is configured to receive the blocking member when the locking mechanism is in an engaged configuration. When the blocking member is received in the blocking member receiving portion, rotation of the at least one primary engaging member about the longitudinal axis of the rotatable member is inhibited and the at least one retainable member is retained by the at least one primary engaging member. Also disclosed is a container having a locking mechanism.



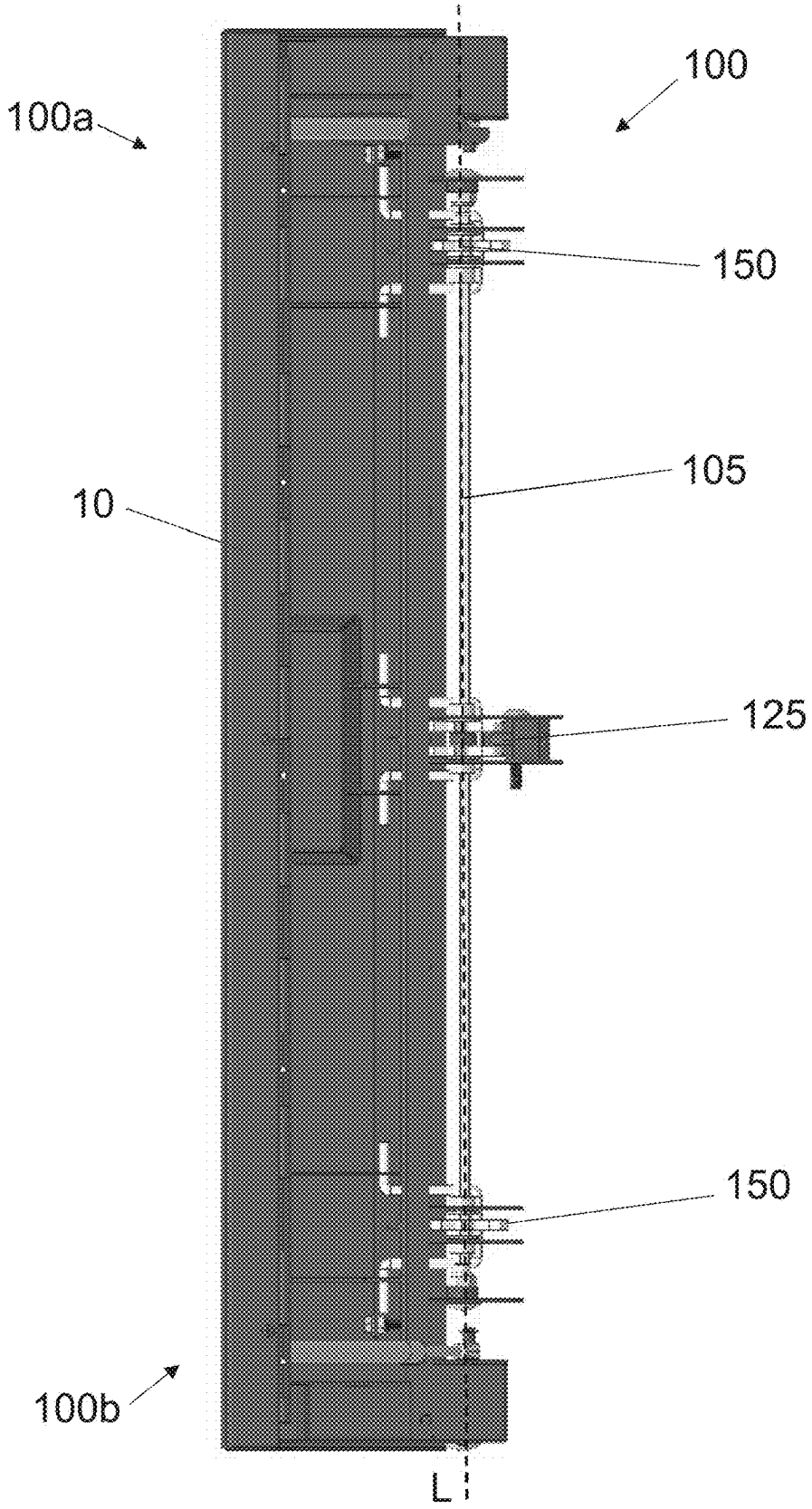
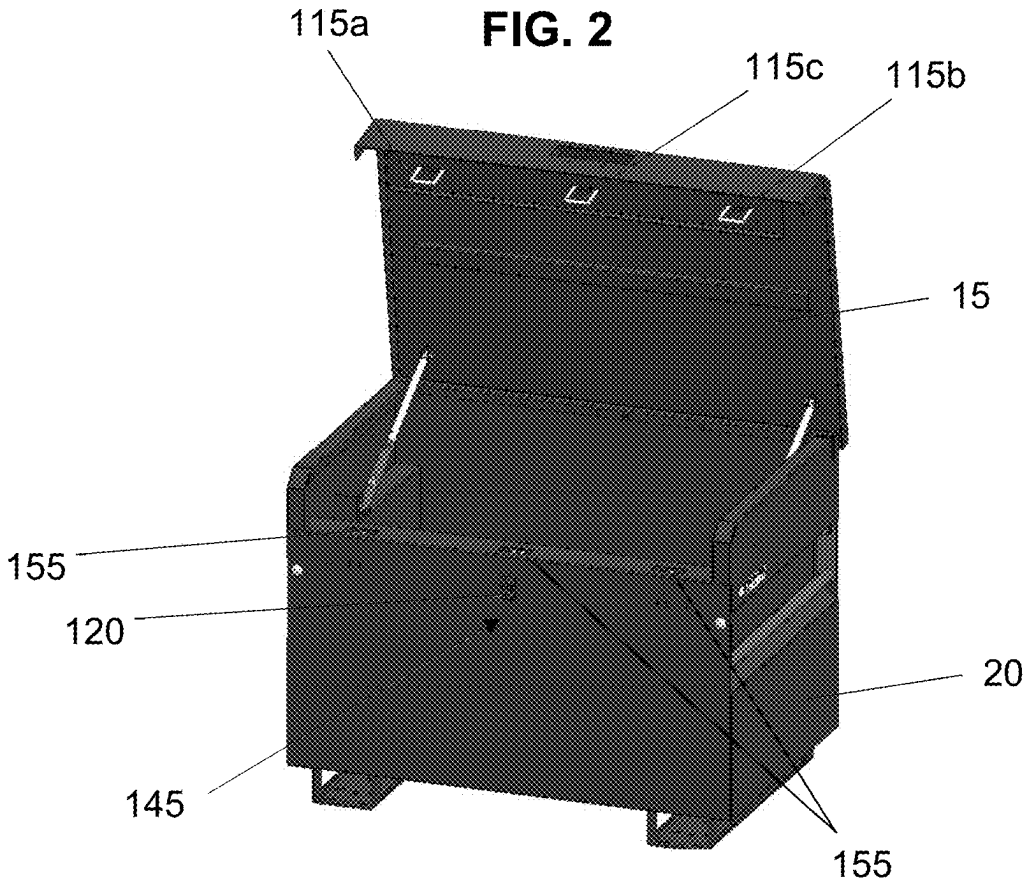


FIG. 1

FIG. 2



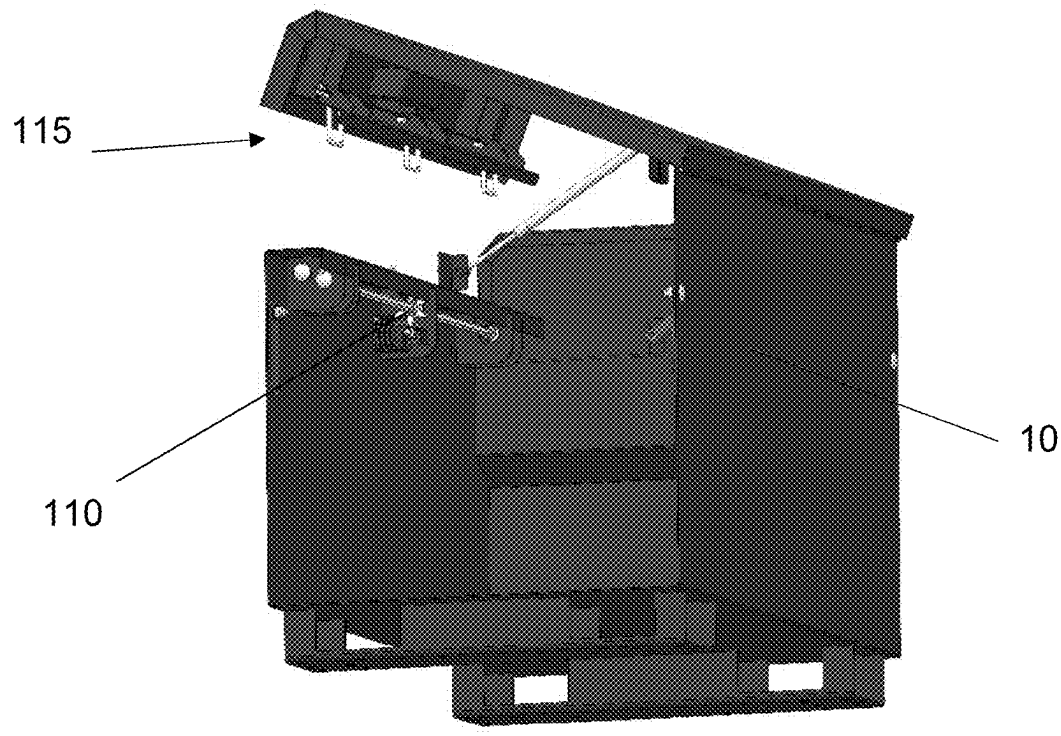


FIG. 3

FIG. 4A

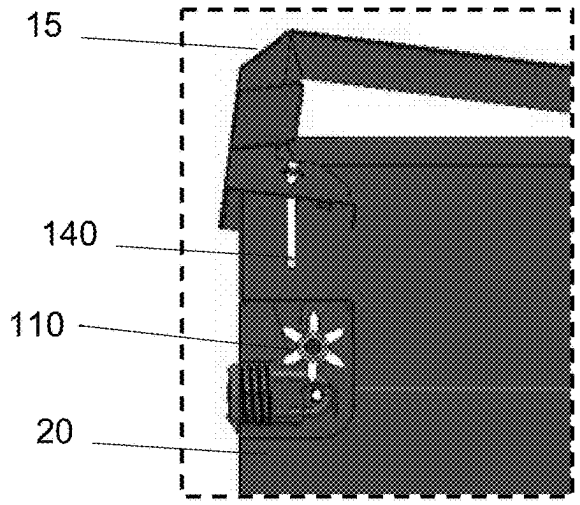
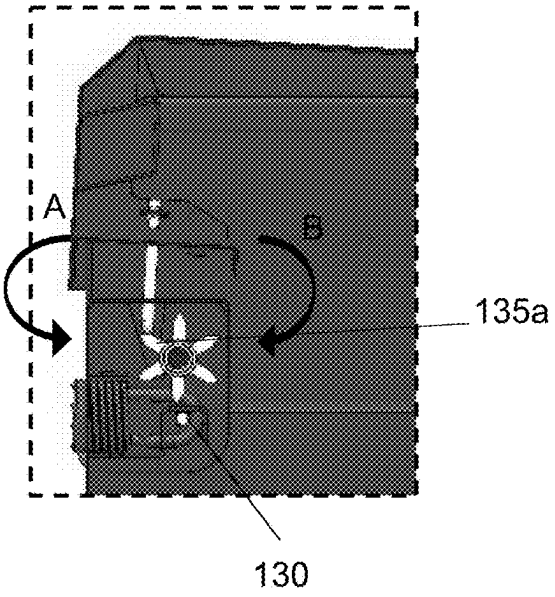


FIG. 4B



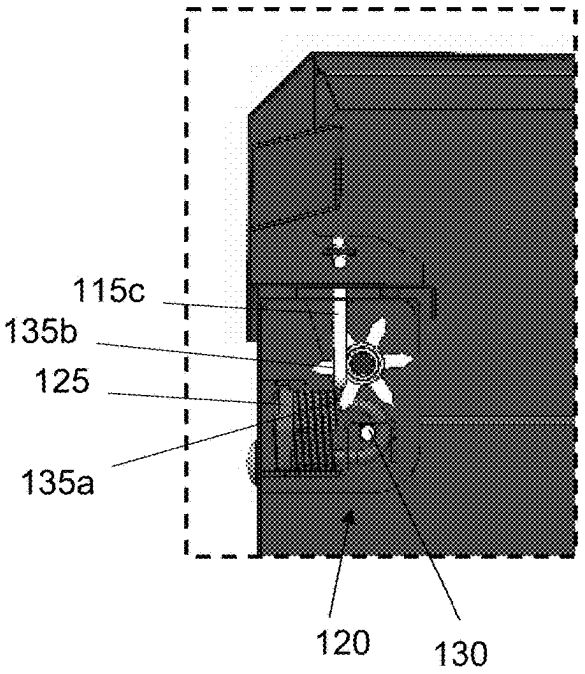


FIG. 4C

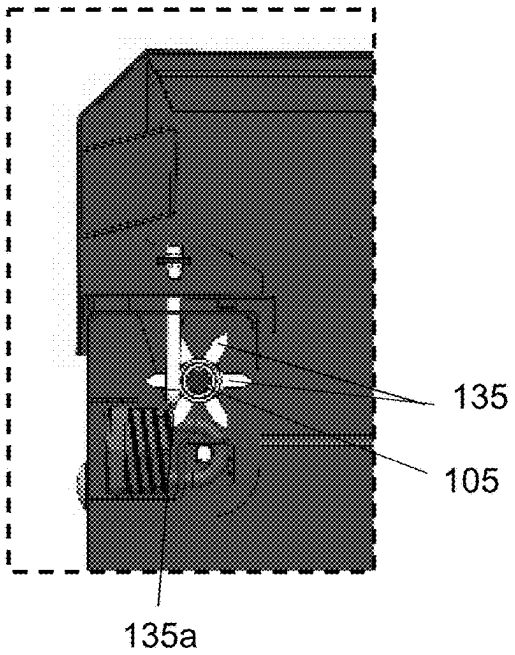
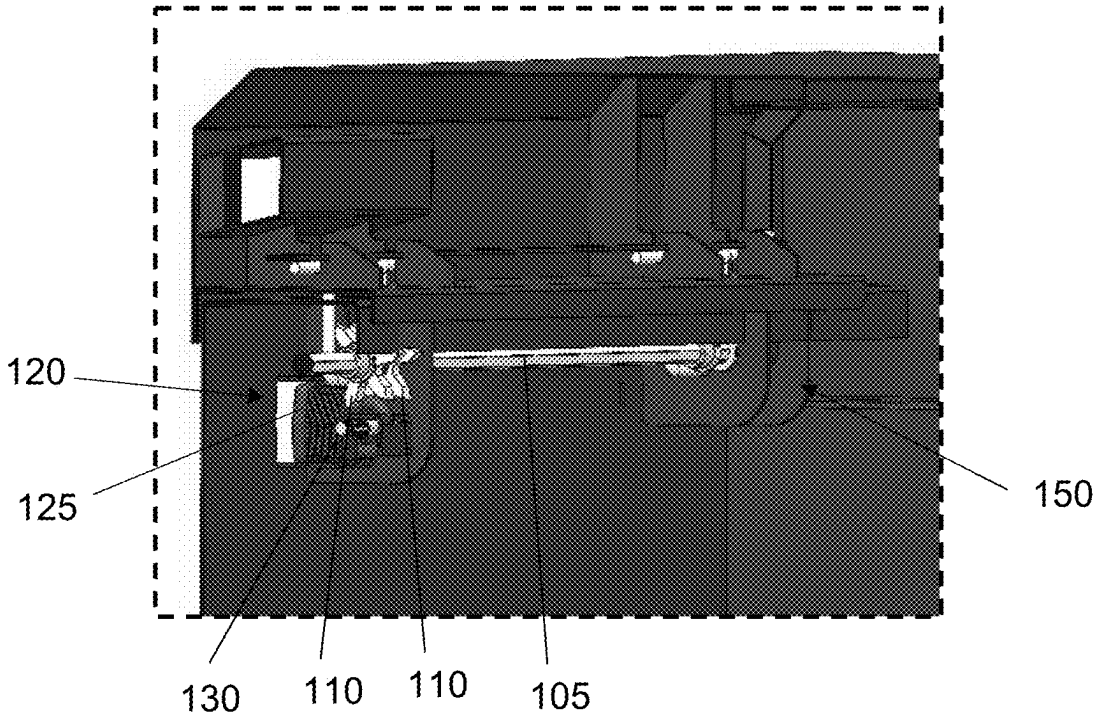


FIG. 4D

FIG. 5


120
125
130
110
110
105
150

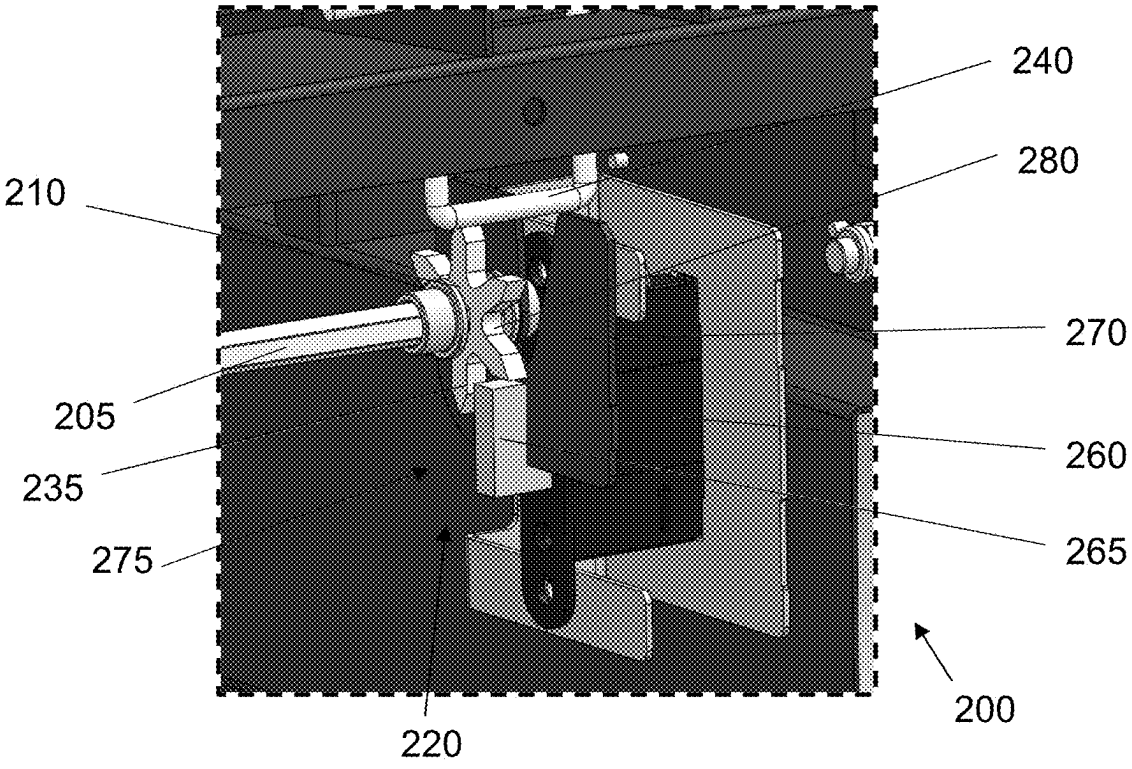
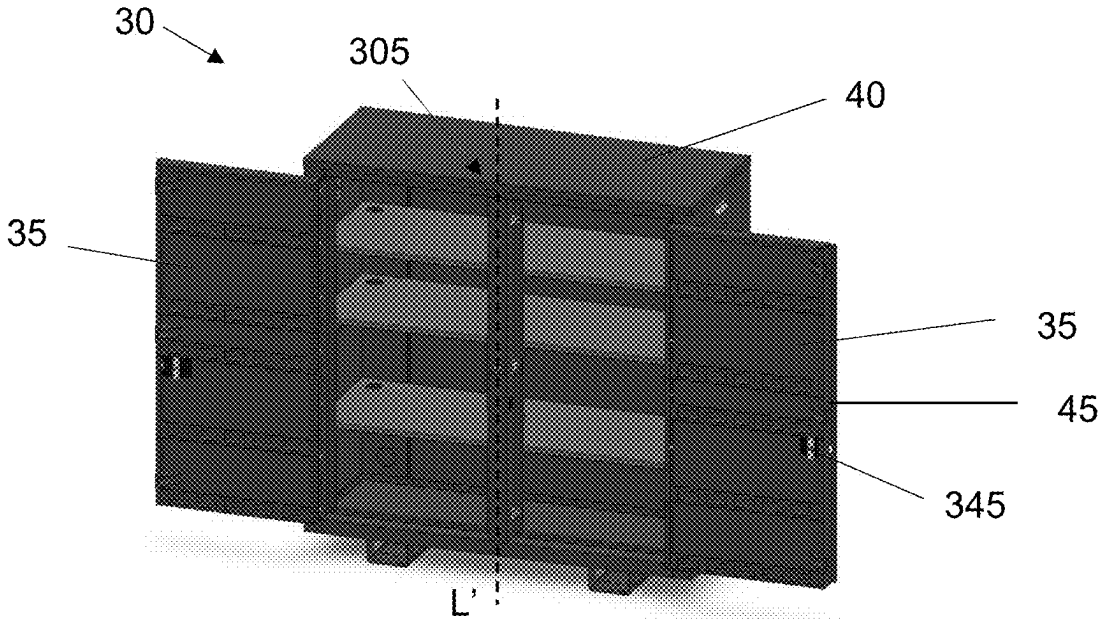

240
280
210
270
205
260
235
265
275
220
200

FIG. 6

FIG. 7



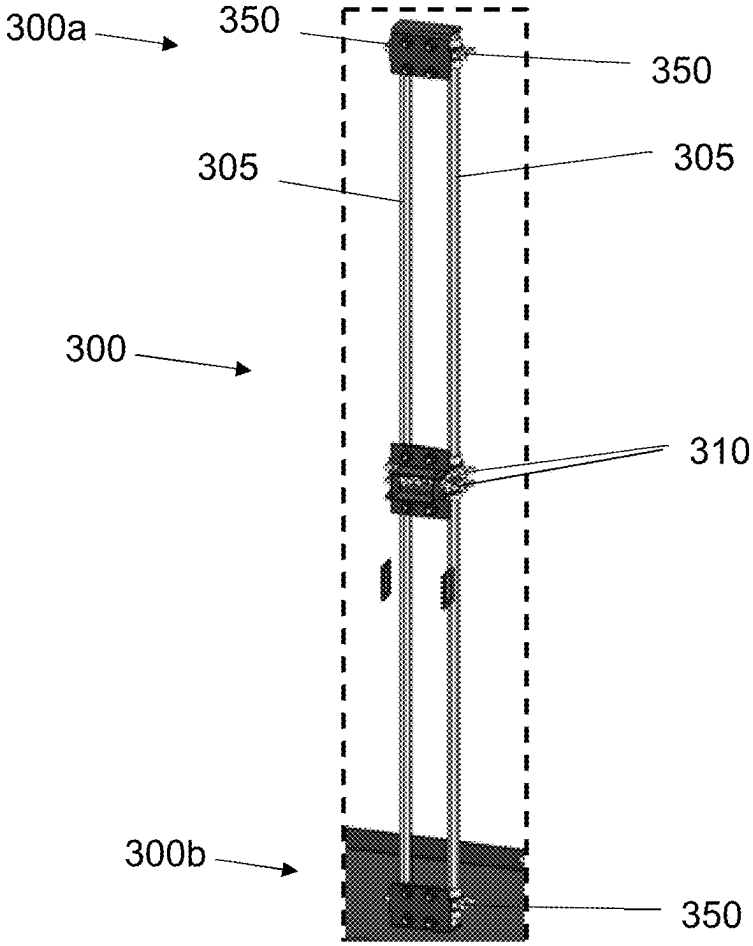
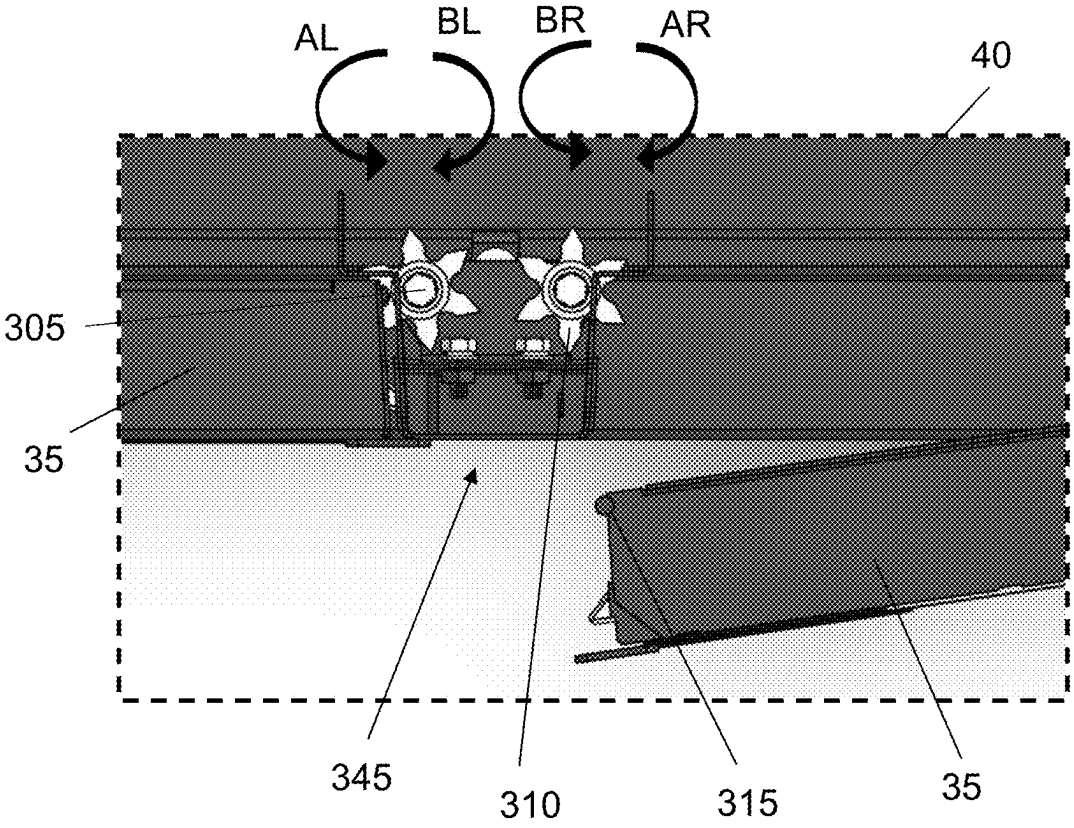


FIG. 8

FIG. 9A



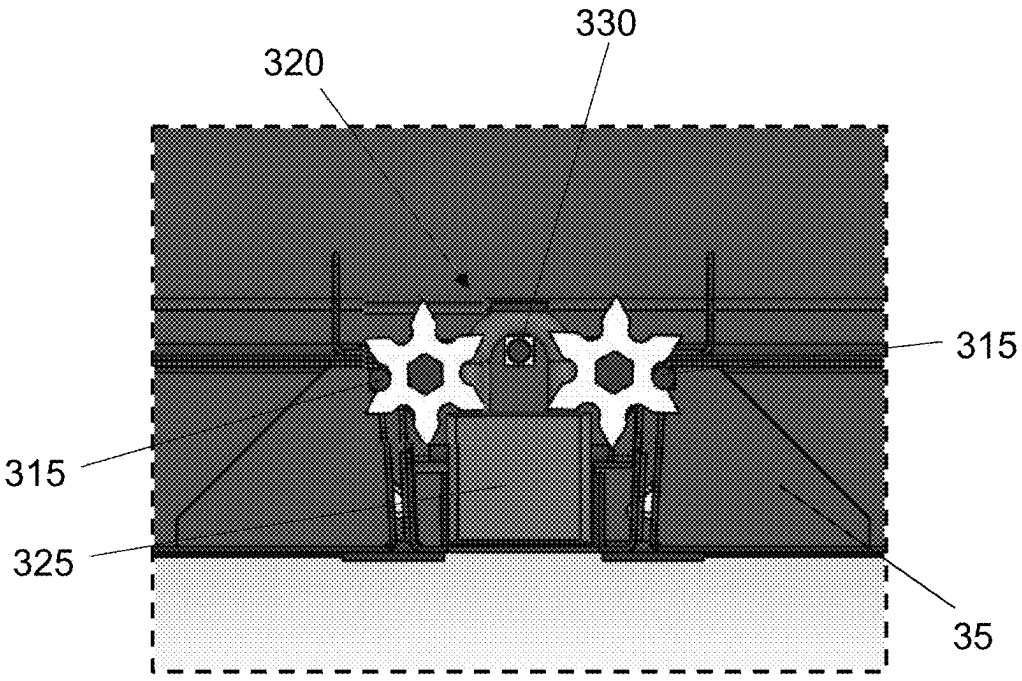


FIG. 9B

FIG. 10

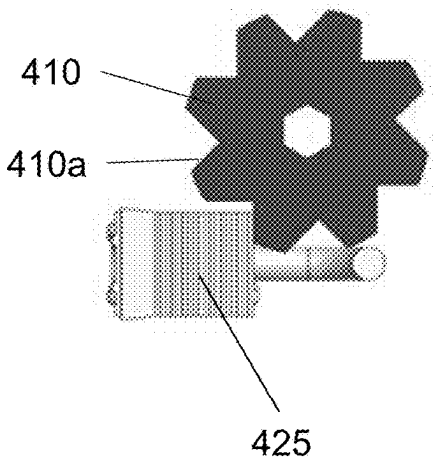


FIG. 11

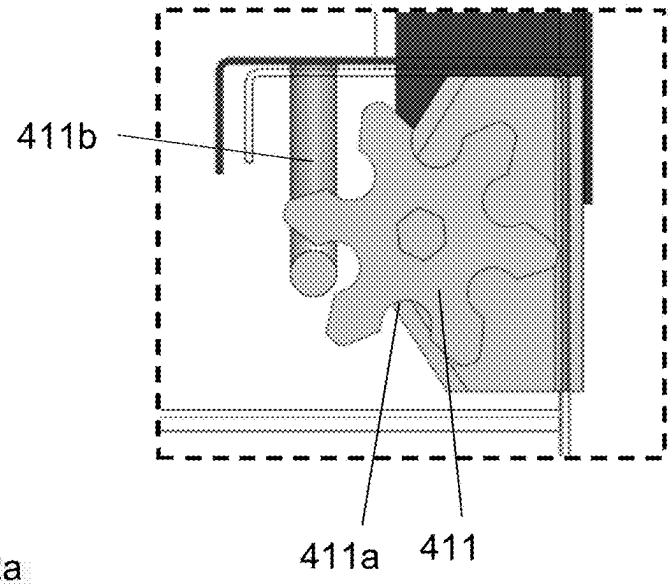


FIG. 12

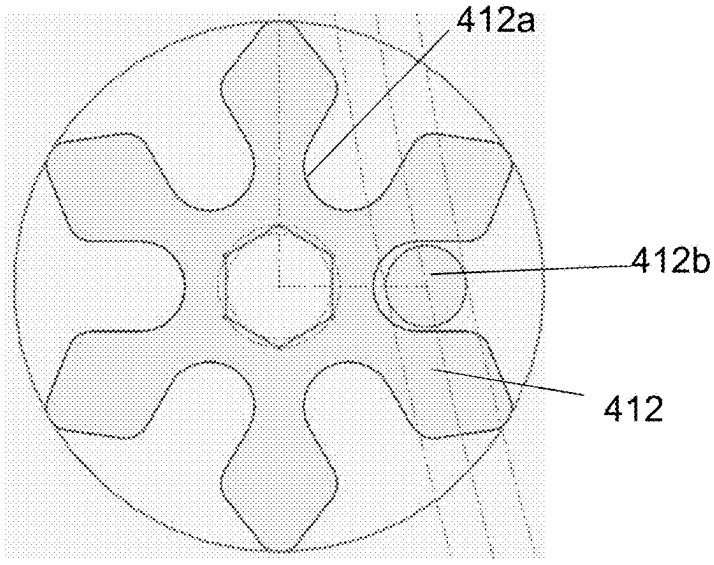


FIG. 13

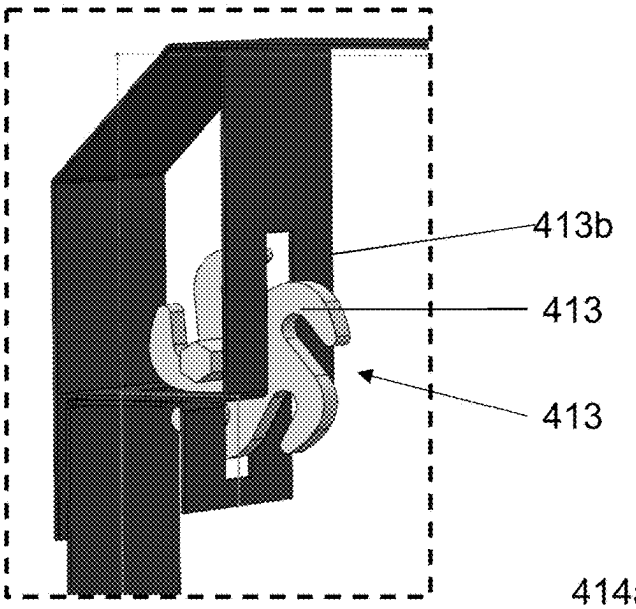


FIG. 14

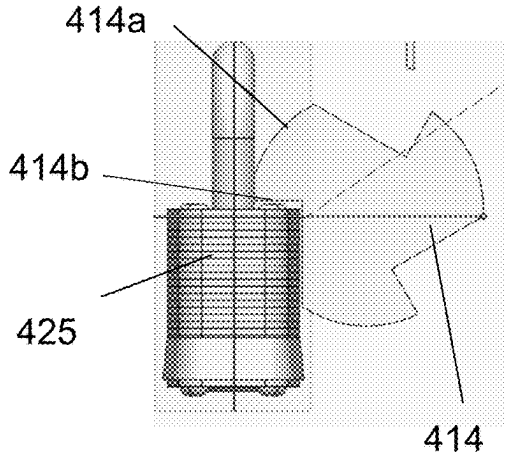
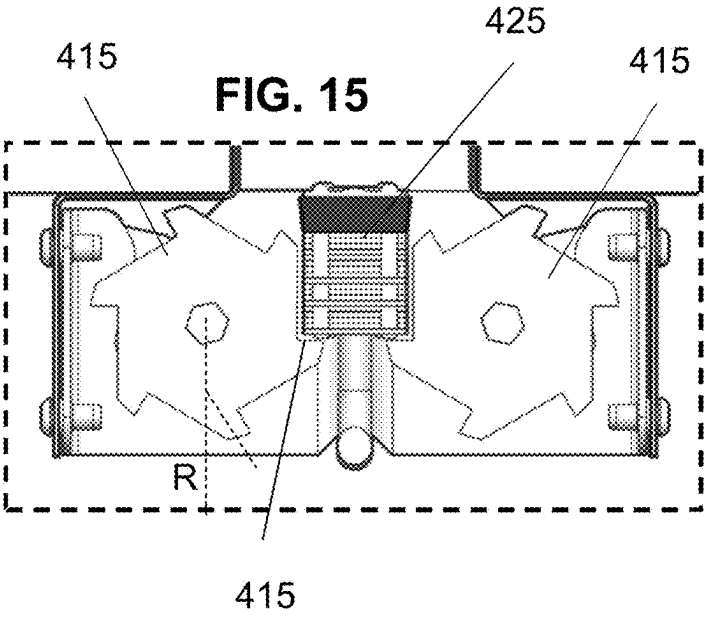


FIG. 15



LOCKING MECHANISM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This continuation application claims priority benefit from International Application No. PCT/GB2023/051463 filed on Jun. 5, 2023, which claimed priority from Great Britain Application No. 2211899.6 filed Aug. 15, 2022, which are both incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

[0002] The present invention relates to a locking mechanism for a container. The present invention also relates to a container comprising a locking mechanism.

BACKGROUND OF THE INVENTION

[0003] Typically, a mortice lock is used to fasten a door, a cabinet or a container, such as a toolbox, such that the contents of the container cannot be accessed without the corresponding key.

[0004] Security of the container to be locked is crucial to prevent unauthorised access to its contents.

[0005] However, complex locking mechanisms requiring multiple user inputs to lock the door or container can be difficult to use and require more user time to operate. Additionally, such locking mechanisms lack compatibility with standard locking devices owned by the user.

[0006] Objects and aspects of the present claimed invention seek to alleviate at least these noted problems as disclosed by the prior art.

SUMMARY OF THE INVENTION

[0007] According to a first aspect of the invention, there is provided a locking mechanism for a container, the locking mechanism comprising; a rotatable member configured to rotate about its longitudinal axis; at least one primary engaging member fixed to the rotatable member and configured to rotate about the longitudinal axis of the rotatable member; at least one retainable member configured to be retained by the at least one primary engaging member when the locking mechanism is in an engaged configuration; and a blocking member receiving portion located adjacent the at least one primary engaging member and configured to receive a blocking member when the locking mechanism is in an engaged configuration, wherein when a blocking member is received in the blocking member receiving portion, rotation of the at least one primary engaging member about the longitudinal axis of the rotatable member is inhibited and the at least one retainable member is retained by the at least one primary engaging member.

[0008] In this way, there is provided a secure locking mechanism with improved ease of operation. Advantageously, a single actuation point can be provided thereby increasing the ease and speed with which a user can unlock and lock an object fitted with the locking mechanism, such as a container. A blocking member of any suitable type can be provided by the user, allowing the user to select the most appropriate lock for the application. Further, the user can replace or change the blocking member as desired, such as to replace old or damaged padlocks or employ a combination lock with a new unlocking code.

[0009] Additionally, the user is not required to undertake a complex series of actions to actuate the locking mechanism. Instead, the user locks or unlocks the blocking member received on the blocking member receiving portion to secure or release the object fitted with the locking mechanism.

[0010] Preferably, the at least one primary engaging member comprises a plurality of projections, wherein any one of the plurality of projections is configured to retain the at least one retainable member when the locking member is in the engaged configuration. In this way, as the rotatable member rotates, the angle of rotation required before the at least one retainable member is retained by a projection of the at least one primary engaging member is reduced. Namely, a smaller rotation of the rotatable member is not required for the at least one retainable member to engage with a projection and become retained by the at least one primary engaging member.

[0011] The engaged configuration is understood to be the configuration wherein the locking member is ready to receive a blocking member such that when the blocking member is received on the blocking member receiving portion, the locking mechanism prevents opening of the container.

[0012] In some embodiments, the plurality of projections comprises two projections. More preferably, the plurality of projections comprises at least three projections. Alternatively, the plurality of projections comprises at least six projections.

[0013] Preferably, the blocking member receiving portion is configured to receive at least one of; a padlock, a combination lock or a deadbolt of a mortice lock. In embodiments where the blocking member receiving portion is configured to receive a deadbolt of a mortice lock, the blocking member receiving portion comprises a guide plate for guiding the deadbolt into abutment with the at least one primary engaging member. In embodiments where the blocking member receiving portion is configured to receive a deadbolt of a mortice lock, the locking mechanism comprises a mortice lock unit comprising a deadbolt.

[0014] In embodiments where the blocking member receiving portion is configured to receive a padlock or a combination lock, the blocking member receiving portion comprises a receiving bar with a longitudinal axis parallel to the longitudinal axis of the rotatable member. In this way, both the longitudinal axis of the rotatable member and the receiving bar are parallel to the ground, in use. Such a configuration is envisaged to be particularly advantageous when the locking mechanism is provided in a 'single door application', such as on a box with a single lid or on a container with a single door.

[0015] Alternatively, the blocking member receiving portion comprises a receiving bar with a longitudinal axis perpendicular to the longitudinal axis of the rotatable member. In this way, the longitudinal axis of the rotatable member is perpendicular to the ground and the receiving bar is parallel to the ground. Such a configuration is envisaged to be particularly advantageous when the locking mechanism is provided in a 'two door application', such as on a cabinet.

[0016] In some embodiments, the at least one primary engaging member comprises a pair of primary engaging members spaced from each other along the rotatable member. Preferably, the spacing of the pair of primary engaging

members along the rotatable member is from 2 mm to 30 mm. More preferably, the spacing of the pair of primary engaging members along the rotatable member is from 5 mm to 20 mm. Preferably, the pair of primary engaging members are a mirrored pair.

[0017] Preferably, the at least one retainable member comprises a plurality of retainable members and the locking mechanism further comprises at least one secondary engaging member fixed to the rotatable member and configured to rotate about the longitudinal axis of the rotatable member, the at least one secondary engaging member configured to engage the at least one retainable member when the locking mechanism is in an engaged configuration.

[0018] In some embodiments, the at least one secondary engaging member comprises a symmetrical cam. In some embodiments, the at least one secondary engaging member is identical to the at least one primary engagement member.

[0019] In some embodiments, the at least one retainable member comprises three, five or seven retainable members. Preferably, the at least one retainable member comprises three retainable members. Preferably, the at least one retainable member comprises a first retainable member located at a first end of the locking mechanism and a second retainable member located at a second end of the locking mechanism. Preferably, the at least one retainable member further comprises a central retainable member located at the midpoint of the locking mechanism. In this way, retainable members are equally spaced along the locking mechanism and substantially uniform security is provided along the length of the locking mechanism. It is understood that a greater number of retainable members may be more appropriate for applications wherein the rotatable member is longer or when increased security is desired.

[0020] Preferably, the number of at least one secondary engaging members is equal to n−1 the number of at least one retainable members. Preferably, the central retainable member is configured to be retained by the at least one primary engaging member when the locking mechanism is in an engaged configuration. Preferably, the first retainable member and second retainable member are configured to be retained by the at least one secondary engaging member when the locking mechanism is in an engaged configuration.

[0021] In select embodiments, the locking mechanism comprises at least one secondary blocking member receiving portion located adjacent the at least one secondary engaging member and configured to receive a blocking member when the locking mechanism is in an engaged configuration. In this way, a multi-point locking mechanism is provided. It is understood that this configuration is undesirable in applications wherein the user wishes to reduce the time spent engaging with the locking mechanism.

[0022] Preferably, the at least one primary engaging member is configured to rotate in a retaining direction and in an opposing releasing direction, wherein in the retaining direction the at least one primary engaging member is urged further into engagement with the at least one retainable member and in the opposing releasing direction the at least one primary engaging member is urged out of engagement with the at least one retainable member; wherein when the locking mechanism is moved from a disengaged position to the engaged position, the at least one retainable member urges the at least one primary engaging member in the retaining direction and when the locking mechanism is moved from the engaged position into the disengaged position, the at least one retainable member urges the at least one primary engaging member in the releasing direction. For example, the retaining direction may be clockwise about the rotatable member and the opposing releasing direction may be anticlockwise about the rotatable member or vice versa.

[0023] It is envisaged that the force urging the at least one primary engaging member to rotate in the retaining direction and/or the releasing direction may be a user force coupled to the at least one retainable member. In some embodiments, the at least one retainable member is fixed to the lid of a container and when the user lowers the lid the at least one primary engaging member is urged further into engagement with the at least one retainable member. Additionally, when the user raises the lid of a container, the at least one primary engaging member is urged out of engagement with the at least one retainable member.

[0024] In another embodiment, the at least one retainable member is fixed to the doors of a container and when the user closes the doors, the at least one primary engaging member is urged further into engagement with the at least one retainable member. Additionally, when the user opens the doors of the container, the at least one primary engaging member is urged out of engagement with the at least one retainable member.

[0025] In some embodiments, the plurality of projections are uniformly spaced about the at least one primary engaging member. In some embodiments, the at least one primary engaging member is rowel shaped. Alternatively, the plurality of projections are a plurality of hooks. In some embodiments, the plurality of projections are curved projections. Preferably, the plurality of curved projections are identical and project in either the retaining direction or the releasing direction, when fixed to the rotatable member. In some embodiments, the at least one primary engaging member is snowflake shaped. In some embodiments, each projection of the plurality of projections is snail shaped. Namely, each projection comprises a straight edge connected to a curved edge.

[0026] Preferably, each projection of the plurality of projections comprises an abutting portion complementary to a portion of the at least one retainable member and configured to abut the at least one retainable member when the locking mechanism is in an engaged configuration. In this way, the abutting portion aids retention of the at least one retainable member in the at least one primary engaging member. In some embodiments, the abutting portion comprises a groove complementary to a blocking member. In some embodiments, the abutting portion comprises a groove complementary to the at least one retainable member. In some embodiments, the abutting portion comprises a slot complementary to the at least one retainable member. In some embodiments, the abutting portion comprises a flat surface configured to abut a blocking member mounted to the blocking member receiving portion.

[0027] Preferably, the rotatable member is fixed in the direction of the longitudinal axis. Namely, the rotatable member can rotate about its longitudinal axis but is not configured to slide in either direction parallel to the longitudinal axis.

[0028] According to a second aspect of the invention, there is provided a container comprising the locking mechanism of the first aspect of the present invention.

[0029] Preferably, the container is one of the following: a box such as a chest, storage box, site box or toolbox; a piano

box; a cabinet; a cupboard; a shipping container; a hazardous goods store; a walk-in storage container; or a room such that the locking mechanism locks an opening to the room.

[0030] Preferably, the at least one retainable member is located in a first area of the container and the at least one primary engaging member is located in a second area of the container. Preferably, the first area of the container is one of; a lid, a door or a pair of doors. Preferably, the second area of the container is the container body comprising an enclosable volume for storing the contents of the container.

[0031] Preferably, the second area of the container comprises at least one retainable member guide configured to guide the at least one retainable member into the second area of the container when the at least one primary engaging member is urged further into engagement with the at least one retainable member.

[0032] Preferably, the elongate member is located parallel to a free edge of the second area. For example, the elongate member may be located parallel to the free edge of the container door or lid. In this way, the at least one primary engagement member is configured to rotate towards and away from the free edge of the container, in the retaining and releasing directions.

[0033] Preferably, the container comprises a guiding aperture configured to guide the blocking member onto the receiving bar. Further, access to the blocking member receiving portion is provided by the guiding aperture. Preferably, the guiding aperture is located on a front face of the container. For example, the front face may be the front face of the body of a container or the doors of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the disclosure and together with the detailed description herein, serve to explain the principles of the disclosure. It is emphasized that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion. The drawings are only for purposes of illustrating preferred embodiments and are not to be construed as limiting the disclosure.

[0035] FIG. **1** depicts a front view of a first embodiment of a locking mechanism according to the first aspect of the invention, the locking mechanism shown in the engaged position, in accordance with an aspect of the present disclosure;

[0036] FIG. **2** depicts a perspective view of the locking mechanism of FIG. **1**, the locking mechanism shown in a disengaged position, in accordance with an aspect of the present disclosure;

[0037] FIG. **3** depicts a further perspective view of the locking mechanism of FIG. **1**, the locking mechanism shown in a disengaged position, in accordance with an aspect of the present disclosure;

[0038] FIG. **4**A depicts a side view of the locking mechanism of FIG. **1**, the locking member shown in a disengaged position, in accordance with an aspect of the present disclosure;

[0039] FIGS. **4**B and **4**C depict a side view of the locking mechanism of FIG. **1**, the locking mechanism shown being urged from a disengaged position to the engaged position, in accordance with an aspect of the present disclosure;

[0040] FIG. **4**D depicts a side view of the locking mechanism of FIG. **1**, the locking member shown in the engaged position, in accordance with an aspect of the present disclosure;

[0041] FIG. **5** depicts a perspective view of the primary engaging member of FIG. **1**, in accordance with an aspect of the present disclosure;

[0042] FIG. **6** depicts a perspective view of a second embodiment of a locking mechanism in accordance with the first aspect of the present invention, the locking mechanism comprising a mortice lock, in accordance with an aspect of the present disclosure;

[0043] FIG. **7** depicts a perspective view of a third embodiment of the locking mechanism of the first aspect of the present invention, in accordance with an aspect of the present disclosure;

[0044] FIG. **8** depicts a perspective view of the pair of rotatable members of the locking mechanism of FIG. **7**, in accordance with an aspect of the present disclosure;

[0045] FIG. **9**A depicts a top view of the locking mechanism of FIG. **7**, the locking mechanism being in a disengaged configuration, in accordance with an aspect of the present disclosure;

[0046] FIG. **9**B depicts a top view of the locking mechanism of FIG. **7**, the locking mechanism is in the engaged configuration, in accordance with an aspect of the present disclosure; and

[0047] FIGS. **10-15** depict various alternative embodiments of the primary engagement member of the locking mechanism of FIGS. **1** to **9**B, in accordance with an aspect of the present disclosure.

DETAILED DESCRIPTION FOR CARRYING OUT THE INVENTION

[0048] With reference to FIGS. **1-5**, a first embodiment of a locking mechanism **100**, in accordance with the first aspect of the invention, fitted to a container **10** is illustrated. In this first embodiment, the locking mechanism **100** is shown in a 'single door application' wherein the container **10** comprises a single lid **15** and a container body **20** comprising an enclosable volume for storing the contents of the container **10**. In this embodiment, the container **10** is a site storage box. The lid **15** is configured to be opened and closed in the standard manner, wherein when the lid **15** is closed, a portion of the lid **15** abuts the container body **20**.

[0049] The locking mechanism **100** comprises an elongate rotatable member **105** comprising a rod with a hexagonal cross-section. The rotatable member **105** is configured to rotate in both directions about its longitudinal axis L.

[0050] The locking mechanism **100** further comprises a pair of primary engaging members **110** fixed to the rotatable member **105** and configured to rotate about the longitudinal axis L of the rotatable member **105**. The pair of primary engaging members **110** are spaced from each other along the rotatable member **105** such that there is a gap between them.

[0051] The locking mechanism **100** further comprises three retainable members **115** comprising a first retainable member **115***a*, a second retainable member **115***b* and a central retainable member **115***c*. The first retainable member **105***a* is located at a first end **100***a* of the locking mechanism **100**, the second retainable member **105***b* is located at a second end **100***b* of the locking mechanism **100** and the central retainable member **105***a* is located at the midpoint

between the first end **105***a* and second end **105***b*. The three retainable members **115** are located on the free edge of the lid **15** of the container **10**.

[0052] The central retainable member **115***c* is configured to be retained by the pair of primary engaging members **110** when the locking mechanism **100** is in an engaged configuration.

[0053] The locking mechanism **100** further comprises a blocking member receiving portion **120** located adjacent the pair of primary engaging members **110**. The blocking member receiving portion **120** is configured to receive a blocking member, such as a padlock **125**, when the locking mechanism **100** is in an engaged configuration. In this way, the blocking member receiving portion **120**, and subsequently the padlock **125**, are located centrally on the locking mechanism **100**, improving access to the padlock **125**. The blocking member receiving portion **120** comprises a cylindrical receiving bar **130** with a longitudinal axis parallel to the longitudinal axis L of the rotatable member **105**. The cylindrical receiving bar **130** is fixed to the container body **20** of the container **10** and has a diameter less than the gap between the shackle and body of the padlock **125**, such that the padlock **125** can be hooked onto, and thereby retained on, the receiving bar **130** with a clearance fit.

[0054] When the locking mechanism **100** is in the engaged configuration, the pair of primary engaging members **110** are located between the central retainable member **115***c* and the receiving bar **120**.

[0055] Each primary engaging member **110** comprises six projections **135** uniformly spaced about the primary engaging member **110** such that each primary engaging member **110** is rowel shaped. The pair of primary engaging members **110** are an identical, mirrored pair and are fixed to the rotatable member **105** such that each projection **135** of a primary engaging member **110** is aligned with a corresponding projection **135** on the other primary engaging member **110**. In this way, when looking along the longitudinal axis L of the rotatable member **105** at the pair of primary engaging members **110**, the distal primary engaging member **110** is obscured behind the proximal primary engaging member **110**, as illustrated in FIG. **4**.

[0056] Each of the six projections **135** comprises an abutting portion complementary to an abutting end **140** of the central retainable member **115***c* and configured to abut the abutting end **140** of the central retainable member **115***c* when the locking mechanism **100** is in an engaged configuration. Each abutting portion comprises a depression complementary to the abutting end **140** of the central retainable member **115***c*.

[0057] The pair of primary engaging members **110** are configured to rotate in a retaining direction A and in an opposing releasing direction B about the longitudinal axis L of the rotatable member **105**. In FIGS. **4**A-**4**D, the retaining direction A is anti-clockwise and the releasing direction B is clockwise. In retaining direction A, the pair of primary engaging members **110** are urged further into engagement with central retainable member **115***c*. In the releasing direction B the pair of primary engaging members **110** are urged out of engagement with the central retainable member **115***c*.

[0058] As illustrated in FIGS. **4**A-**4**D, the user can move the lid **15** from an open to a closed position against the container body **20**. The action of closing the lid **15** brings the abutting end **140** of the central retainable member **115***c* into contact with a first projection **135***a* of each of the pair of primary engaging members **110**, illustrated in FIG. **4**B. The central retainable member **115***c* provides a force to these first projections **135***a* such that the pair of primary engaging members **110** and the rotatable member **105** are urged to rotate in the retaining direction A.

[0059] Located adjacent to the first projection **135***a*, in the releasing direction B, is a second projection **135***b*. As the pair of primary engaging members **110** are urged in the retaining direction A, the second projection **135***b* abuts the abutting end **140** of the central retainable member **115***c*. When the lid **15** is fully closed against the body, as illustrated in FIG. **4**C, the central retainable member **115***c* is located in the abutting portion of the first projection **135***a* and the second projection **135***b*.

[0060] The pair of primary engaging members **110** are spaced apart such that the shackle of the padlock **125** can be located on the receiving bar **130** between the pair of primary engaging members **110**. The user is guided by a guiding aperture **145** located in the front wall of the container **10**, the guiding aperture **145** guiding the shank of the padlock **125** to a position between the pair of primary engaging members **110**. In this way, rotation of the pair of primary engaging members **110** and rotatable member **105** is not inhibited by the shackle of the padlock **125** when the shackle is retained on the receiving bar **130**, as illustrated in FIGS. **4**A and **4**B. When the lid **15** is shut, the user can close and lock the padlock **125**, thereby bringing the body of the padlock **125** towards the shackle. It is understood that other blocking members may not comprise an extending and contracting function, and therefore the user would only attach the blocking member to the blocking member receiving portion **120** after the lid **15** of the container **10** was closed if they wished to lock the container **10**.

[0061] The locking mechanism **100** is located within a casing of the container **10** such that when the locking mechanism **100** is in the engaged position, access to the locking mechanism **100** is restricted to the guiding aperture **145** only.

[0062] When the padlock **125** is closed on the receiving bar **130**, rotation of the primary engaging members **110** and rotatable member **105** in the releasing direction B is inhibited. As illustrated in FIG. **4**D, the first projection **135***a* abuts the body of the padlock **125** and when the user attempts to open the lid **15** of the container **10**, rotation of the primary engaging members **110** is inhibited.

[0063] Abutment of the first projection **135***a* against the padlock **125** provides a force inhibiting opening of the lid **15** of the container **10**. Removal of the padlock **125** from the receiving bar **130** is inhibited without first unlocking the padlock **125**. As such, unauthorised access to the contents of the container **10** is inhibited when the locking mechanism **100** is in the engaged position and the padlock **125** is locked to the blocking member receiving portion **120**.

[0064] When the lid **15** is closed, the central retainable member **115***c* is removably retained by the pair of primary engaging members **110** and the locking mechanism **100** is in an engaged configuration, as illustrated in FIGS. **4**C and **4**D. When the central retainable member **115***c* is not retained by the pair of primary engaging members **110**, such as when the lid **15** is partially or fully open, as illustrated in FIGS. **4**A and **4**B, the locking mechanism **100** is in a disengaged configuration.

[0065] When the user unlocks and removes the padlock **125** from the receiving bar **130**, rotation of the primary

engaging members **110** and rotatable member **105** in the releasing direction B is no longer inhibited by abutment of the first projection **135***a* against the padlock **125**. The locking mechanism **100** is thereby free to move from the engaged configuration to a disengaged configuration.

[0066] In the reverse process, when the lid **15** is opened by the user, the central retainable member **115***c* urges the pair of primary engaging members **110** in the releasing direction A. Both the pair of primary engaging members **110** and the rotatable member **105** are free to rotate in the releasing direction A and the central retainable member **115***c* is thereby released from abutment with the pair of primary engaging members **110**. The user may freely open and close the lid **15** until the locking mechanism **100** is returned to the engaged configuration and the padlock **125** is reattached and locked to the receiving bar **130**.

[0067] Any of the six projections **135** may act as the first projection **135***a*, and the second projection **135***b* will inherently be any adjacent projection **135** in the releasing direction B. In this way, additional rotation of the primary engaging members **110** such that a designated first projection **135***a* which abuts the central retainable member **115** is not required.

[0068] The locking mechanism **100** further comprises two secondary engaging members **150**, each secondary engaging member **150** fixed to the rotatable member **105** and configured to rotate about the longitudinal axis L of the rotatable member **105**. In this embodiment, the secondary engaging members **150** are identical to each primary engaging member **110** of the pair of primary engaging members **110**. In a similar manner as outlined above in relation to the central retainable member **115***c* and the pair of primary engaging members **110**, one secondary engaging member **150** is configured to engage the first retainable member **115***a* when the locking mechanism **100** is in an engaged configuration and the other secondary engagement member **150** is configured to engage the second retainable member **115***b* when the locking mechanism **100** is in an engaged configuration. The secondary engaging members **150** are also configured to rotate in retaining direction A and in opposing releasing direction B about the longitudinal axis L of the rotatable member **105**.

[0069] As the primary engaging members **110** and the secondary engaging members **150** are aligned on the rotatable member **105**, if rotational motion of only one of the primary engaging members **110** or secondary engaging members **150** is inhibited, then rotational movement is inhibited for all primary engaging members **110** and secondary engaging members **150**.

[0070] The container body **20** comprises three retainable member guides **155** configured to guide the retainable members **115** into the container body **20** when lid **15** is closed and the pair of primary engaging members **110** are urged into or further into engagement with the retainable members **115**. A retainable member guide **155** is located in each of the first end **100***a*, second end **100***b* and midpoint between the first end **105***a* and second end **105***b* of the locking mechanism **100**. Each retainable member guide **155** comprises an aperture, and access to each retainable member **115** is inhibited as, in the engaged configuration, each retainable member **115** is located within the container body **20**.

[0071] In the following description similar numerals will be used for similar parts of further embodiments of the locking mechanism invention **100**.

[0072] With reference to FIG. **6**, a second embodiment of the locking mechanism **200** is illustrated. In this embodiment, the locking mechanism **200** comprises a mortice lock **260** comprising a deadbolt **265** and the blocking member receiving portion **220** is configured to receive the deadbolt **265**. The locking mechanism **200** of the second embodiment omits a receiving bar. The blocking member receiving portion **220** instead comprises a deadbolt receiving aperture **270** configured to receive a deadbolt **265**. The deadbolt **265** may be drawn into and out of the deadbolt receiving aperture **270**, for example when a user turns the corresponding key in the mortice lock **260**.

[0073] When the deadbolt **265** is located within the deadbolt receiving aperture **270**, rotation of the primary engaging members **210** and rotatable member **205** in the releasing direction is inhibited due to abutment of a projection **235** against the deadbolt **265**. In a similar manner to the locking mechanism **100** of the first embodiment of the invention, unauthorised access to the contents of the container is inhibited unless the user has the corresponding key to the mortice lock **260**.

[0074] The locking mechanism **200** further comprises a guide plate **270** configured to guide the deadbolt **265** into the deadbolt receiving aperture **275**.

[0075] FIG. **6** illustrates each abutting portion **280** of the six projections **235** comprising a curved depression complementary to the abutting end **240** of the central retainable member. Each abutting portion **280** is located at the base of each projection **235**.

[0076] With reference to FIGS. **7-9**, a third embodiment of a locking mechanism **300**, in accordance with the first aspect of the locking mechanism **300** is fitted to a cabinet **30**. In this third embodiment, the locking mechanism **300** is shown in a 'two door application' wherein the cabinet **30** comprises two doors **35** and a cabinet body **40** comprising an enclosable volume for storing the contents of the cabinet **30**. In this embodiment, the cabinet **30** is a worksite storage cabinet. Both doors **35** are configured to be opened and closed in the standard manner, wherein when each door **35** is closed, a portion of the door **35** abuts the cabinet body **40**.

[0077] The locking mechanism **300** of the third embodiment is similar to the locking mechanism **100** of the first embodiment. Differences between the two embodiments will be outlined herein. Unless otherwise described the locking mechanism **300** of the third embodiment operates in the manner described in the first embodiment of the locking mechanism invention **100**.

[0078] The locking mechanism **300** comprises a mirrored pair of rotatable members **305** of equal length arranged parallel to one another. A rotatable member **305** is fixed to the cabinet body **40** at the location where each door **35** abuts the cabinet body **40**. The longitudinal axis L' is parallel to a free edge **45** of each door. In this embodiment, the rotatable member **305** is substantially equal to the length of the free edge **45** of the door **35**. The locking mechanism **300** of FIG. **8** is shown in the engaged configuration, wherein both doors **35** of the cabinet **30** are closed. In the engaged configuration, the pair of rotatable members **305** are aligned.

[0079] The locking mechanism **300** comprises four secondary engaging members **350**, two secondary engaging members **350** located on each rotatable member **305**. A

secondary engaging member **350** of each rotatable member **305** is located in the first end **300***a* of the locking mechanism **300**. In a similar manner, the other secondary engaging member **350** of each rotatable member **305** is located in the second end **300***b* of the locking mechanism **300**.

[0080] The locking mechanism **300** comprises two mirrored pairs of primary engaging members **310**, a pair of primary engaging members **310** located on each rotatable member **305**. In this way, each rotatable member **305** comprises a pair of primary engaging members **310** and is configured in substantially the same manner as the rotatable member **105** and primary engaging members **110** of the embodiment of FIGS. **1** to **5**. Each pair of primary engaging members **310** is located at the midpoint between the first end **300***a* and second end **300***b*.

[0081] Each door **35** comprises a retainable member **315** comprising a continuous elongate bar. Each elongate bar extends the length of the door **35**. The elongate bar is rotational loose to aid retention of the retainable member **315** on the primary engaging members **310**. In some embodiments, the elongate bar is not continuous and is only located adjacent each primary engaging member **310** and secondary engaging member **350**. In such embodiments, the elongate bar extends to first end **300***a* and second end **300***b* of the locking mechanism **300**. The primary engaging members **310** are configured to rotate in a retaining direction and in an opposing releasing direction about the longitudinal axis L of the rotatable member **305**. In FIGS. **9**A and **9**B, the left-hand pair of primary engaging members **310** have a retaining direction AL and a releasing direction BL and the right-hand pair of primary engaging members **310** have a retaining direction AR and a releasing direction BR. In the retaining directions AL, AR, the pairs of primary engaging members **110** are urged further into engagement with the retainable member **315**. In the releasing directions BL, BR, the pairs of primary engaging members **110** are urged out of engagement with the retainable member **315**. In this way, each rotatable member **305** is a mirrored pair of the other.

[0082] The blocking member receiving portion **320** comprises a receiving bar **330** with a longitudinal axis perpendicular to the longitudinal axis L' of the pair of rotatable members **305**. In this way, the longitudinal axis L' of each of the pair of rotatable members **305** is perpendicular to the ground and the receiving bar **330** is parallel to the ground when the cabinet **30** is placed in normal use on the ground.

[0083] The user can attach a padlock **325** to the receiving bar **330**, such that rotation of the primary engaging members **310** is inhibited by the body of the padlock **325** when the padlock **325** is locked.

[0084] Each door **35** comprises a casing configured to encase a portion of the locking mechanism **300** to prevent damage to or interference with the locking mechanism **300**. Access to the blocking member receiving portion **320** is provided by a guiding aperture **345** configured to guide the padlock **325** into the correct location on the receiving bar **330**. In some embodiments, the plurality of projections are uniformly spaced about the at least one primary engaging member. In some embodiments, the at least one primary engaging member is rowel shaped. Alternatively, the plurality of projections are a plurality of hooks. In some embodiments, the plurality of projections are curved projections. Preferably, the plurality of curved projections are identical and project in either the retaining direction or the releasing direction, when fixed to the rotatable member **305**. In some embodiments, the at least one primary engaging member is snowflake shaped. In some embodiments, each projection of the plurality of projections is snail shaped. Namely, each projection comprises a straight edge connected to a curved edge.

[0085] Preferably, each projection of the plurality of projections comprises an abutting portion complementary to a portion of the at least one retainable member and configured to abut the at least one retainable member when the locking mechanism is in an engaged configuration. In this way, the abutting portion aids retention of the at least one retainable member in the at least one primary engaging member. In some embodiments, the abutting portion comprises a groove complementary to a blocking member. In some embodiments, the abutting portion comprises a groove complementary to the at least one retainable member. In some embodiments, the abutting portion comprises a flat surface configured to abut a blocking member **425** mounted to the blocking member receiving portion.

[0086] With reference to FIG. **10**, there is illustrated an alternative embodiment of a primary engaging member **410** according to the first aspect of the invention. For ease of illustration, the blocking member **425** of each of FIGS. **10**, **14** and **15** is assigned the same reference numeral, although it is understood that the blocking member **425** used may be any suitable shape or size blocking member, such as a padlock.

[0087] The primary engaging member **410** comprises eight projections and each projection has an abutting portion comprising a flat surface **410***a* configured to abut the blocking member **425** mounted to the blocking member receiving portion (not pictured).

[0088] With reference to FIG. **11**, there is illustrated a further embodiment of a primary engaging member **411** according to the first aspect of the invention. The primary engaging member **411** comprises six projections and is snowflake shaped. Each projection has an abutting portion comprising a semi-circular groove **411***a* complementary to retainable member **411***b*.

[0089] With reference to FIG. **12**, there is illustrated a further embodiment of a primary engaging member **412** according to the first aspect of the invention. The primary engaging member **412** of FIG. **12** is similar to the primary engaging member **411** of FIG. **11**. The groove **412***a* comprises a half-stadium shape to aid retention of the retainable member **412***b* in the groove **412***a*.

[0090] With reference to FIG. **13**, there is illustrated a further embodiment of a primary engaging member **413** according to the first aspect of the invention. The five projections are uniformly spaced about the primary engaging member **410** of FIG. **10** and each projection is curved. The curved projections are identical and project in the retaining direction, when fixed to the rotatable member **105**, **205**, **305**. The abutting portion of each projection comprises a slot **413***a* complementary to the retainable member **413***b*.

[0091] With reference to FIG. **14**, there is illustrated a further embodiment of a primary engaging member **414** according to the first aspect of the invention. The three projections are snail shaped. Namely, each projection comprises a leading curved edge **414***a* which increases in radius from a straight edge **414***b* which extends along a radius of the primary engaging member **411**. The straight edge **414***b*

is comprises a flat surface configured to abut a blocking member **425** mounted to the blocking member receiving portion (not pictured).

[0092] With reference to FIG. **15**, there is illustrated a further embodiment of two primary engaging members **415** according to the first aspect of the invention, the primary engaging members **415** shown in the 'two door application', such as on a cabinet. Each primary engaging member **415** comprises six projections protruding at an angle to the radius R of the primary engaging member **415**. Each abutting portion comprises a flat surface **415***a* configured to abut a blocking member mounted to the blocking member receiving portion.

[0093] As may be recognized by those of ordinary skill in the art based on the teachings herein, numerous changes and modifications may be made to the above-described and other embodiments of the present disclosure without departing from the scope of the disclosure. The components of the locking mechanism as disclosed in the specification, including the accompanying abstract and drawings, may be replaced by alternative component(s) or feature(s), such as those disclosed in another embodiment, which serve the same, equivalent or similar purpose as known by those skilled in the art to achieve the same, equivalent or similar results by such alternative component(s) or feature(s) to provide a similar function for the intended purpose. In addition, the locking mechanism may include more or fewer components or features than the embodiments as described and illustrated herein. For example, the components and features of FIGS. **1-15** may be used interchangeably and in alternative combinations as would be modified or altered by one of skill in the art. Specifically, locking mechanisms **100**, **200** and **300** may be used in alternative combinations as would be modified or altered by one of skill in the art. Accordingly, this detailed description of the currently preferred embodiments is to be taken in an illustrative, as opposed to limiting of the disclosure.

[0094] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the disclosure. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has", and "having"), "include" (and any form of include, such as "includes" and "including"), and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method or locking mechanism that "comprises," "has," "includes," or "contains" one or more steps or elements possesses those one or more steps or elements but is not limited to possessing only those one or more steps or elements. Likewise, a step of a method or an element of a locking mechanism that "comprises," "has," "includes," or "contains" one or more features possesses those one or more features, but is not limited to possessing only those one or more features. Furthermore, a locking mechanism or structure that is configured in a certain way is configured in at least that way but may also be configured in ways that are not listed.

[0095] The disclosure has been described with reference to the preferred embodiments. It will be understood that the architectural and operational embodiments described herein are exemplary of a plurality of possible arrangements to provide the same general features, characteristics, and general system operation. Modifications and alterations will occur to others upon a reading and understanding of the preceding detailed description. It is intended that the disclosure be construed as including all such modifications and alterations

What is claimed is:

1. A locking mechanism for a container, the locking mechanism comprising;

a rotatable member configured to rotate about its longitudinal axis;

at least one primary engaging member fixed to the rotatable member and configured to rotate about the longitudinal axis of the rotatable member;

at least one retainable member configured to be retained by the at least one primary engaging member when the locking mechanism is in an engaged configuration; and

a blocking member receiving portion located adjacent the at least one primary engaging member and configured to receive a blocking member when the locking mechanism is in an engaged configuration,

wherein when a blocking member is received in the blocking member receiving portion, rotation of the at least one primary engaging member about the longitudinal axis of the rotatable member is inhibited and the at least one retainable member is retained by the at least one primary engaging member.

2. The locking mechanism of claim **1**, wherein the at least one primary engaging member comprises a plurality of projections,

wherein any one of the plurality of projections is configured to retain the at least one retainable member when the locking member is in the engaged configuration.

3. The locking mechanism of claim **2**, wherein the at least one primary engaging member is rowel shaped.

4. The locking mechanism of claim **2**, wherein the plurality of projections are a plurality of hooks.

5. The locking mechanism of claim **2**, wherein each projection of the plurality of projections comprises an abutting portion complementary to a portion of the at least one retainable member and configured to abut the at least one retainable member when the locking mechanism is in an engaged configuration.

6. The locking mechanism of claim **1**, wherein the blocking member receiving portion is configured to receive at least one of; a padlock, a combination lock or a deadbolt of a mortice lock.

7. The locking mechanism of claim **6**, wherein the blocking member receiving portion comprises a receiving bar with a longitudinal axis parallel to the longitudinal axis of the rotatable member.

8. The locking mechanism of claim **6**, wherein the blocking member receiving portion comprises a receiving bar with a longitudinal axis perpendicular to the longitudinal axis of the rotatable member.

9. The locking mechanism of claim **1**, wherein the at least one primary engaging member comprises a pair of primary engaging members spaced from each other along the rotatable member.

10. The locking mechanism of claim **8**, wherein the spacing of the pair of primary engaging members along the rotatable member is from 5 mm to 20 mm.

11. The locking member of claim **8**, wherein the pair of primary engaging members are a mirrored pair.

12. The locking mechanism of claim **1**, wherein the at least one retainable member comprises a plurality of retainable members and the locking mechanism further comprises at least one secondary engaging member fixed to the rotatable member and is configured to rotate about the longitudinal axis of the rotatable member, the at least one secondary engaging member is configured to engage the at least one retainable member when the locking mechanism is in an engaged configuration.

13. The locking mechanism of claim **1**, wherein the at least one primary engaging member is configured to rotate in a retaining direction and in an opposing releasing direction,

wherein in the retaining direction the at least one primary engaging member is urged further into engagement with the at least one retainable member and in the opposing releasing direction the at least one primary engaging member is urged out of engagement with the at least one retainable member;

wherein when the locking mechanism is moved from a disengaged position to the engaged position, the at least one retainable member urges the at least one primary engaging member in the retaining direction and when the locking mechanism is moved from the engaged position into the disengaged position, the at least one retainable member urges the at least one primary engaging member in the releasing direction.

14. A container comprising the locking mechanism of claim **1**.

15. The container of claim **14**, wherein the at least one retainable member is located in a first area of the container and the at least one primary engaging member is located in a second area of the container.

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