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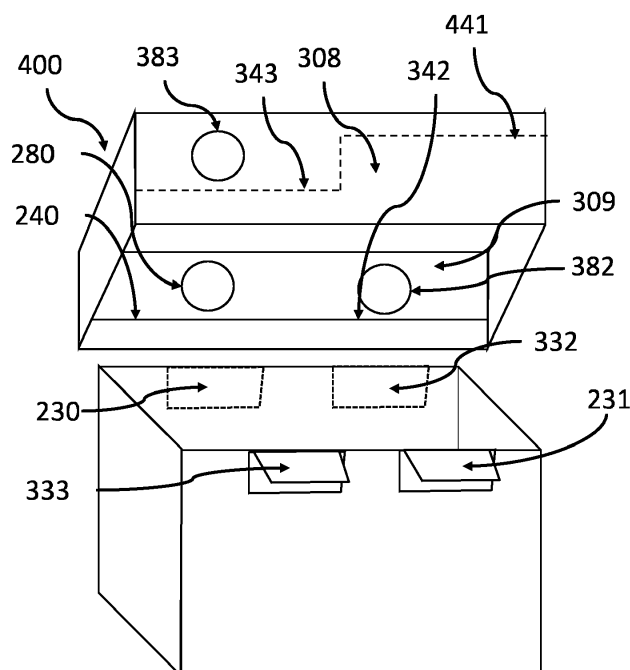
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(54) CONTAINER WITH LOCKABLE LID

(57) A box with a sidewall structure, a reversible lid (400) with top and flanks, and a lock. At least a portion of the flanks covers at least a portion of the sidewall structure when the box is locked. The lock has an active actuator (230) moveable from a locking to an opening position by applying pressure. The active actuator is connected to the portion of the sidewall structure and abuts against a locking tab (240) of the lid when in the

locking position. The flanks comprise an actuation area (280) to displace the active actuator by applying the pressure. The box comprises a passive actuator (231) paired to the active actuator. The paired actuators are 180 degrees from each other around the central axis. The passive actuator is inactivated by an inactivation configuration of the lid located at 180 degrees from the locking tab around the central axis.

**FIG. 4**

Description

BACKGROUND OF THE INVENTION

[0001] This invention generally relates to containers comprising a box, a lid for the box, and a lock to maintain the lid in a closed position. In order for the lock to be operative, the lid may have to be placed in a specific position. Lid misplacement onto the box may prevent locking, or render locking permanent, preventing unlocking.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002]

FIG. 1A-C illustrates an example container or consumer product.

FIG. 2 illustrates another example container or consumer product.

FIG. 3 illustrates another example container or consumer product.

FIG. 4 illustrates another example container or consumer product.

FIG. 5 illustrates another example container or consumer product.

FIG. 6 illustrates another example container or consumer product.

FIG. 7 illustrates another example container or consumer product.

FIG. 8 illustrates another example container or consumer product.

FIG. 9 illustrates another example container or consumer product.

FIG. 10 illustrates another example container or consumer product.

FIG. 11 illustrates an example method to operate an example locked container or an example locked consumer product.

FIG. 12A-D illustrates example blanks.

DETAILED DESCRIPTION OF THE INVENTION

[0003] A lid is an important structural element of a container as it participates in protecting a content of the container from external conditions, and permits controlling the access to such content. This disclosure focuses on a reversible lid. A reversible lid should be understood as a lid which may be placed on a box to close the box in at least two different orientations. Such a lid may for example take a generally rectangular or oval shape, in which case such lid may be placed on a box in at least two different orientations, whereby such two different orientations correspond to a rotation of the lid by 180 degrees in relation to a central axis of the top of the lid. In some examples, such a reversible lid may be placed on a box to close the box in no more than two different orientations.

[0004] In cases of a reversible lid comprising a lock, the lock may have a non-symmetrical structure, for example in order to be adapted to the asymmetrical configuration of an adult human hand, such that the lock may function as expected in one orientation but may be dysfunctional in another orientation of the reversible lid. The present case aims at resolving such a situation.

[0005] In this disclosure, the container comprises a box. A box should be understood as a generally parallelepiped, barrel shaped, cylindrical, oval or cubical three dimensional object defining a cavity. The use of parallelepiped boxes may facilitate storage and transportation by permitting piling up boxes in a space efficient manner. In some examples, a box may be a parallelepiped provided with some rounded, tapered trapezium or chamfered edges. The box according to this disclosure comprises a base, a sidewall structure and an opening opposite the base. A base according to this disclosure should be understood as a surface on which the box may lie when placed on a supporting surface such as a shelf or a floor. In some examples, the base is flat. In some examples, the base is rectangular. In some examples, the base is oval. In some examples, the base has an embossed profile standing in or out in relief. The sidewall structure according to this disclosure should be understood as extending from the base, and connecting the base to the opening, or to a transition piece between the sidewall structure and the opening. It should be understood that the connection of the base to the opening may include one or more transition pieces in addition to a sidewall. In some examples, such a transition piece may be glued or otherwise attached to the sidewall structure. In some examples, the sidewall structure is perpendicular to the base. In some examples, the base is rectangular and has four sides, four sidewalls forming the sidewall structure extending perpendicular from the base, each sidewall being rectangular, each side wall being connected by a sidewall side to a side of the base, and by two other sidewall sides to two others of the four sidewalls. In some examples the base is oval and the sidewall structure forms a generally cylindrical barrel shaped wall extending from the base in a direction normal or perpendicular to the base. In some examples, sidewalls have a shape corresponding to one of a square, a rectangle, a trapeze, a polygon, a section of a sphere, a section of an ovoid, or a section of an ellipsoid. The opening according to this disclosure should be understood as a complete or partial aperture providing access to a content of the box. In some examples, the opening faces the base. In some examples, the opening has a surface of less than the surface of the base. In some examples, the opening has a surface larger than the surface of the base in order to provide improved access, for example using sidewalls extending from the base at angle of more than 90 degrees from the base. In some examples, the opening is provided after removal of a tamper proof feature, for example comprising a perforated piece to be removed at first use or a tamper evident

sticker locking a lid to the box. In some examples a tamper evident sticker is glued on the lid and on the box, whereby the tamper evident sticker should be broken, torn or perforated at first opening to indicate to a consumer that the container has not been tampered with before purchase. This tamper evident sticker may for example be in paper or in plastic. In some examples, the opening is placed on a top panel of the box, the top panel of the box facing, i.e. opposite, the base of the box, the top panel of the box being separated from the base of the box by at least the sidewall structure, the top panel of the box being generally coplanar with the base of the box. In some examples, the opening is rectangular. In some examples, the opening is rectangular with rounded edges. In some examples, the opening is round or oval. In some examples, the opening is a permanent opening. In some examples, the opening is a reclosable opening. Examples of a reclosable opening comprise openings reclosable by a single flap, or a reclosable opening reclosable through a spout like structure, for example a spout like structure comprising a main flap which, in a reclosed position, would cover the opening, and side elements which, when the opening is open, link the main flap with sides of the opening.

[0006] The container comprises a lid for the box. The lid according to this disclosure should be understood as an element permitting to repeatedly close or open the opening of the box. The lid may be disconnected and separated from the box, for example to provide an improved access to the content of the box. The lid according to this disclosure comprises a top and flanks. It should be understood that the lid is aimed at covering the opening of the box when the lid is in a closed position. In some examples, the top of the lid is rectangular. In some examples the top of the lid is hexagonal, octagonal, polygonal or oval, structures such as oval being for example approximated by multiplying a number of flanks. In some examples, the lid comprises beveled edges. In some examples, the top of the lid is rectangular with rounded edges. It should be understood that while being named "top", the top of the lid may be positioned in different orientations. The lid comprises flanks. It should be understood that the flanks according to this disclosure are elements connected to the top of the lid and extending from the top of the lid in order to engage the sidewall structure of the box, each flank having an extension along a corresponding sidewall or sidewall structure section. The flanks participate in placing the top of the lid onto the opening. In some examples, the flanks extend perpendicularly from the top of the lid. In some examples, the flanks surround an entire perimeter of the top of the lid. In some examples, the flanks partially surround an entire perimeter of the top of the lid, a portion of the top of the lid being flankless. At least a portion of the flanks covers at least a portion of the sidewall structure of the box when the lid is in the closed position. The box and lid cooperate to participate in fulfilling the role of the container to store, transport and facilitate access to the content of the con-

tainer.

[0007] Due to the lid being in this disclosure a reversible lid, the top is substantially 180 degrees symmetrical around a central axis normal to the top of the lid. In some examples, the central axis is parallel to the flanks. In some examples, the top is rectangular, the central axis passing through the center of the rectangle. In some examples, the top is oval, the central axis passing through the center of the oval. Substantially should be understood as within 10%, preferably within 5%, of a measure concerned, taking into account manufacturing tolerances for example. A non-substantial angular variation would thereby be a variation of less than 18 degrees (5% of 180 degrees), preferably of less than 9 degrees.

[0008] The container according to this disclosure comprises a lock. The lock is to repeatedly maintain the lid in a closed or open position. A lock should be in this disclosure understood as a mechanism providing appropriate closure and protection of a content of the box, as well as preventing or reducing the likelihood of an accidental opening. The lock according to this disclosure is to maintain the lid in a closed position. It should be understood that the lock according to this disclosure is expected to function under normal use of the container. It should be understood that the lock may not fulfill its function when for example unusual use is made of the container, or when the container is under unusual conditions.

[0009] The lock comprises a specific active actuator moveable from a locking position to an opening position by applying an actuation pressure onto the specific active actuator when the lid is in the closed position. An example specific active actuator is a mechanical structure submitted to a movement upon actuation by an outside force or actuation pressure, such movement leading to the opening of the lock when such movement takes place. In some examples, the specific active actuator is resilient and has a default position, such default position corresponding to the lid remaining closed, a resilience being vanquished by an outside force or actuation pressure in order to open the lid. In some examples, the specific active actuator is resilient in that the specific active actuator comprises a flexible element, such as a flap for example, the flexible element having a default position corresponding to the lid remaining closed, the flexible element being pressed to open the lid, the flexible element springing back to the default position when releasing pressure. It should be understood that a pressure is generated by the application of a force onto a surface. Example specific active actuators have at least two positions being the opening position and the locking position, whereby the opening position corresponds to a position permitting opening of the lid, the locking position preventing opening of the lid to protect the content from humidity or extreme temperature, for example, or reducing the possibility of an accidental opening of the lid.

[0010] The specific active actuator is connected to the specific portion of the sidewall structure covered by at least a portion of the flanks of the lid when the lid is in the

closed position, the specific active actuator abutting against a corresponding locking tab of the lid when in the locking position, the specific active actuator being for example maintained away from the locking tab when in the opening position, the specific active actuator being displaceable by the actuation pressure by an unlocking displacement distance in a direction normal (i.e. perpendicular) to the specific portion of the sidewall structure. The connection to the specific portion may for example be a fold line at an end of a sidewall away (or distal) from the base. The connection of the actuator to the specific portion of the sidewall structure is due to the actuator participating in locking or unlocking the specific portion of the sidewall structure from the portion of the lid covering the specific portion of the sidewall structure, thereby permitting selectively releasing the lid from the box. The lid comprises a locking tab. A locking tab should be understood as a mechanical element which interlocks with the active actuator. In some examples the locking tab extends away from part of the lid and may be in the form of a bulge, a ridge, an embossment or an additional material layer sticking out of the lid and towards the specific portion of the sidewall structure such that the active actuator may abut against the tab when in the locking position to prevent separating the specific portion of the sidewall structure from the lid in the area of the active actuator. In some examples, the locking tab is comprised in the lid itself, the locking tab being for example formed by an aperture in a flank of the lid. Abutment according to this disclosure should be understood as a contact between the active actuator or part of the active actuator and the corresponding locking tab, such contact preventing opening of the lid. In some examples the active actuator is maintained away from the locking tab by pressure when in the opening position, in order to release the locking tab. Such release of the locking tab permits opening the lid. Displacement or movement of the active actuator from the locking to the opening position is by application on the active actuator of the actuation pressure or force such that the actuator is displaced by a distance sufficient to suppress contact of the actuator with the locking tab, such distance corresponding to the displacement distance, in a direction normal to the specific portion of the sidewall structure. Such force or pressure may also comprise a minor component which may be parallel to the sidewall structure, due to the fact that the force or pressure may be applied by a finger of a human adult hand which does not necessarily align force completely perfectly. The actuation is however triggered by a component of such force or pressure being normal to the portion of the sidewall structure. Such presence requirement of a component normal to the portion of the sidewall structure in order to unlock the lock participates in the role of the lock avoiding an accidental opening, for example in absence of such normal force component, whereas desired opening would take place by a consumer "pushing" the active actuator and applying the unlocking force or pressure permitting opening of the lid.

[0011] In order to provide precision in locating a finger appropriately, the flanks comprise a specific actuation area, the actuation area facing the specific active actuator. The fact that such actuation area faces the actuator indeed permits locating either the thumb or one or more of the other fingers on exactly the area on which a lock opening force should be applied. The specific actuation area should be understood as defining a localised discontinuity on the flanks, whereby a user or consumer may perceive such discontinuity in order to correctly locate the thumb or one or more other fingers. Such discontinuity may comprise one or more of an actuation aperture, an actuation flap, an actuation slit, an actuation membrane, or tactile elements comprised in or applied to a surface of the flank such as embossments, debossments, surface texturing, buttons or the like. In some examples, the actuation area or the specific portion comprises a visual indication indicating the location of the actuation area. In some examples whereby the actuation area is an aperture, the specific portion may comprise a visual indication visible through the aperture, respectively apertures, when the lid is closed. The visual indication may be printed on an external surface of the flanks and may comprise one or more arrows or one or more areas printed in a striking colour or a specific text providing instructions such as "push here to open" for example, or a combination of any of these indications. The specific actuation area is configured to permit displacing the specific active actuator from the locking position to the opening position by applying the actuation pressure at the specific actuation area when the lid is in the closed position. In order to appropriately place the thumb or one or more other fingers, the actuation area can in some examples span less than 8 cm² and more than 0.2 cm² in order to reduce or avoid lack of precision in finger placement, and, on the other hand, avoid that the specific actuation area be so small that it would result difficult to locate for a user or consumer. In some examples, the actuation area has a circular shape in order to ease positioning. Other shapes may be considered such as, for example, elliptical, oval, square, triangular, square with rounded corners, triangular with rounded corners, other polygonal shapes or other polygonal shapes with rounded corners.

[0012] In some examples, an actuation area spans less than 8 cm² and more than 0.2 cm², each actuation area defining a centroid; each centroid being separated from the top of the lid by less than 5 cm and by more than 0.5 cm; each centroid being separated from a distal end of the corresponding flank by more than 0.5 cm; and the top of the lid spans less than 13 cm and more than 6 cm along a direction normal to the specific portion at the centroid, in particular at the centroid of a second actuation area when present. Complying with such combined conditions was found particularly suited to reaching all the actuation areas with a single adult hand at the same time.

[0013] The box comprises a specific passive actuator

connected to a second portion of the sidewall structure. A passive actuator should be understood as having characteristics equal to or similar to an active actuator, except that the passive actuator does not participate in locking the box, while an active actuator does participate in such locking. In fact, the specific passive actuator is connected to a second portion of the sidewall structure so that it may serve as an active actuator if the reversible lid would be placed in an alternative, reversed, position. The specific passive actuator and the specific active actuator are indeed paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position. In other words, considering a reversible lid having a first placement position and a second placement position different from the first position, both positions permitting repeatable closing and opening of the box, a given actuator is an active actuator in the first lid position and the same given actuator is a passive actuator in the second lid position. An actuator in fact becomes a passive actuator according to this disclosure due to the specific passive actuator being inactivated by a specific inactivation configuration of the lid when the lid is in a closed position, the specific inactivation configuration and the locking tab corresponding to the specific active actuator being substantially symmetrically located at 180 degrees from each other around the central axis.

[0014] Figures 1A-C illustrate an example container 100. Such example container is illustrated closed in Figure 1A, open in Figure 1B, and illustrated in Figure 1C as a cross section view along a plane P, following direction V normal to the plane P, illustrated in Figure 1A.

[0015] Example container 100 comprises a box 101, a reversible lid 102 for the box, and a lock 103 to maintain the lid in a closed position, the box comprising a base 104, a sidewall structure 105 and an opening 106 opposite to the base, the lid comprising a top 107 and flanks 108, the top covering the opening, whereby the top is substantially 180 degrees symmetrical around a central axis CA normal to the top, whereby at least a portion of the flanks covers at least a specific portion 150 of the sidewall structure of the box when the lid is in the closed position, the lock comprising a specific active actuator 130 moveable from a locking position to an opening position by applying an actuation pressure AP onto the specific active actuator when the lid is in the closed position, whereby the specific active actuator 130 is connected to the specific portion 150 of the sidewall structure, whereby the specific active actuator abuts against a corresponding locking tab 140 of the lid when in the locking position, the specific active actuator being displaceable by the actuation pressure by an unlocking displacement distance in a direction normal to the specific portion of the sidewall structure, whereby the flanks comprise a specific actuation area 180, the actuation area facing the specific active actuator, the specific actuation area being configured to permit displacing the specific active actuator from the locking position to the

opening position by applying the actuation pressure AP at the specific actuation area 180 when the lid is in the closed position, the box comprising a specific passive actuator 131 connected to a second portion 151 of the sidewall structure, the specific passive actuator 131 and the specific active actuator 130 being paired to be substantially symmetrically located at 180 degrees from each other around the central axis CA when the lid is in the closed position, whereby the specific passive actuator is inactivated by a specific inactivation configuration of the lid when the lid is in the closed position, the specific inactivation configuration and the locking tab (corresponding to the specific active actuator) being substantially symmetrically located at 180 degrees from each other around the central axis. One should note that plane P intersects the passive and active actuators for illustration purposes, the central axis being comprised in plane P.

[0016] As illustrated in Figures 1A-C, the top of the lid and the sidewall structure of the box define in this example an oval shape, such that reversibility of the lid results in the possibility to close the lid in one of two different manners, aligning a major axis of the lid along a direction MA and a major axis of the box at 0 degrees or at 180 degrees around the central axis, the major axis intersecting a minor axis of the lid along a direction MI, the minor axis being shorter than the major axis, directions MI and MA being perpendicular to and intersecting central axis CA when the container is closed. While the sidewall structure of the box comprises two functionally equivalent actuators 130 and 131, one of such actuators, actuator 130 in the Figures 1A-C, becomes the active actuator due to the fact that it cooperates with the locking tab 140 and the actuation area 180 of the lid, while the other actuator, actuator 131 in the Figures 1A-C, gets inactivated by the specific inactivation configuration of the lid. In this example, the inactivation configuration corresponds to an absence of locking tab at 180 degrees of the central axis from the locking tab, the inactivation configuration being in this example obtained through a continuous internal flank side facing and extending beyond the passive actuator, preventing locking of such passive actuator whereby, depending on whether such continuous internal flank contacts or not the actuator, such continuous internal flank side facing and extending beyond the passive actuator either generates pressure, by contact, on the specific passive actuator when the lid is in the closed position, or prevents contact with the specific passive actuator, in both cases preventing locking by abutment. As will be illustrated through other examples, other types of inactivation configurations may be provided.

[0017] Such a configuration permits placing the lid either as illustrated, or in a reversed position (not illustrated here) whereby the actuator 131 would face locking tab 140 and become the active actuator, whereas the actuator 130 would, in turn, face the inactivation configuration and become the passive actuator. The lock would

thereby be functional regardless of the orientation of the reversible lid, in this case with a single lock feature 103.

[0018] Figure 2 illustrates an example container 200 illustrated open.

[0019] Example container 200 comprises a box 201, a reversible lid 202 for the box, and a lock 203 to maintain the lid in a closed position, the box comprising a base 204, a sidewall structure 205 and an opening 206 opposite to the base, the lid comprising a top 207 and flanks 208, the top covering the opening, whereby the top is substantially 180 degrees symmetrical around a central axis CA normal to the top, whereby at least a portion of the flanks covers at least a specific portion 250 of the sidewall structure of the box when the lid is in the closed position, the lock comprising a specific active actuator 230 moveable from a locking position to an opening position by applying an actuation pressure onto the specific active actuator when the lid is in the closed position, whereby the specific active actuator 230 is connected to the specific portion 250 of the sidewall structure, whereby the specific active actuator abuts against a corresponding locking tab 240 of the lid when in the locking position, the locking tab being represented in dashed line due to being placed inside of the corresponding lid flank in this illustrated configuration, the locking tab 240 being for example produced by folding back of a lid flank panel (see for example the lid blanks described in Figures 12B or 12C), the specific active actuator being displaceable by the actuation pressure by an unlocking displacement distance in a direction normal to the specific portion of the sidewall structure, whereby the flanks comprise a specific actuation area 280, the actuation area facing the specific active actuator, the specific actuation area being configured to permit displacing the specific active actuator from the locking position to the opening position by applying the actuation pressure at the specific actuation area 280 when the lid is in the closed position, the box comprising a specific passive actuator 231 connected to a second portion 251 of the sidewall structure, the specific passive actuator 231 being in this illustration represented in dashed line due to being located at the back of the box 201, the specific passive actuator 231 and the specific active actuator 230 being paired to be substantially symmetrically located at 180 degrees from each other around the central axis CA when the lid is in the closed position, whereby the specific passive actuator is inactivated by a specific inactivation configuration of the lid when the lid is in the closed position, the specific inactivation configuration and the locking tab corresponding to the specific active actuator being substantially symmetrically located at 180 degrees from each other around the central axis.

[0020] As illustrated in Figure 2, the top of the lid and the sidewall structure of the box define in this example a rectangular and non-square shape, such that reversibility of the lid results in the possibility to close the lid in one of two different manners, aligning a major axis of the lid and a major axis of the box at 0 degrees or at 180 degrees

around the central axis, the major axis of the box and of the lid being along a direction MA intersecting a minor axis of the rectangle along direction MI, the minor axis being shorter than the major axis, the minor and major axis intersecting the central axis CA and being perpendicular to the central axis CA when the container is closed, the minor and major axis being in this case perpendicular to each other and parallel to respective lid flanks. While the sidewall structure of the box comprises two functionally equivalent actuators 230 and 231, one of such actuators, actuator 230 in the Figure 2, becomes the active actuator due to the fact that it cooperates with the locking tab 240 and the actuation area 280 of the lid, while the other actuator, actuator 231 in the Figure 2, gets inactivated by the specific inactivation configuration of the lid. In this example, the inactivation configuration corresponds to an absence of a locking tab at 180 degrees of the central axis from the locking tab, the inactivation configuration being in this example obtained through a continuous internal flank side facing and extending beyond the passive actuator, preventing locking of such passive actuator. As will be illustrated through other examples, other types of inactivation configurations may be provided.

[0021] Such a configuration permits placing the lid either as illustrated, or in a reversed position (not illustrated here) whereby the actuator 231 would face locking tab 240 and become the active actuator, whereas the actuator 230 would, in turn, face the inactivation configuration and become the passive actuator. The lock would thereby be functional regardless of the orientation of the reversible lid, in this case with a single lock feature 203.

[0022] Figure 3 illustrates an example container 300. Such container comprises features similar to features already discussed for example in the context of Figure 2 and numbered using the same reference numerals. In this example, the container 300 comprises an additional pair of active actuators 332 and 333, the lid of the container comprising for each such additional pair of active actuators respective additional locking tabs 342 and 343 and respective additional actuation areas 382 and 383, each additional active actuator of the pair being paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position, the respective additional locking tabs being substantially symmetrically located at 180 degrees from each other around the central axis. While not illustrated here, more such additional pairs of actuators may be provided together with respective additional locking tabs and additional actuation areas. One should note that in this example, locking tabs 342 and 240 share a same sidewall and are obtained using a single tab extended to face both respective active actuators 230 and 332. Locking tabs may also be provided as independent locking tabs corresponding to a single active actuator, as represented locking tab 343 for example. A container provided with one or more such additional pair of active actuators requires simultaneous operation of the

different lock elements, each lock element corresponding to a respective active actuator, each lock element being for example operated with a different finger, for example a different finger of a same adult hand.

[0023] Example container 300 comprises a single additional pair of active actuators, whereby a specific flank 308 comprises one of the respective additional actuation areas, such respective additional actuation area 383 being a single actuation area of the specific flank 308. Such a configuration may be particularly suited to operating the lock using a single adult hand, the single actuation area 383 being operated by a thumb of the single adult hand and the other actuation areas 382 and 280 being simultaneously operated by two other fingers of the same adult hand to unlock the container. In some examples, in order to centre a lock comprising such single additional pair of active actuators, the single actuation area of the specific flank is located off-centre of the specific flank as represented in Figure 3. In some examples, for example as represented in Figure 3, the single actuation area 383 of the specific flank is located on the left hand side of the specific flank from the point of view of an observer of the specific flank when the box sits upright with the lid in the closed position, for example in order to ease a single handed operation of the lock by a right handed person by centring of the hand onto the lid. In some example, such as the example represented in Figure 3, the lid comprises a flank 309 opposite to the specific flank, such opposite flank comprising the specific actuation area 280 and the additional actuation area 382 paired with the single actuation area 383 of the specific flank. In some examples, not illustrated in this Figure 3, the single actuation element may be located centered, in other words substantially centered along a major axis. Such central location would avoid accidentally pressing the single actuation element with a thumb of an adult hand lifting the closed container by holding the lid, such lifting taking intuitively place by centering the palm of the hand on lid, the thumb being thereby off centered and away from the single actuation element during such lifting.

[0024] Figure 4 illustrates an example container 400. Such container comprises features similar to features already discussed for example in the context of Figure 2 or in the context of Figure 3 and numbered using the same reference numerals. In this example container 400, the inactivation configuration comprises an extended tab 441, such extended tab extending from a distal end of a lid flank, along an internal side of the flank, and towards the top of the lid, and extending beyond a reach of the corresponding actuator 231, the extended tab 441 preventing abutment of the actuator 231 and thereby inactivating actuator 231 and turning such actuator 231 into a passive actuator, the extended tab producing a continuous internal extended tab surface facing and extending beyond the passive actuator, preventing locking of such passive actuator whereby, depending on whether such continuous extended tab contacts or not the actuator,

such continuous internal extended tab surface facing and extending beyond the passive actuator either generates pressure, by contact, on the specific passive actuator when the lid is in the closed position, or prevents contact with the specific passive actuator, in both cases preventing locking by abutment.

[0025] Figure 5 illustrates an example container 500. Such container is similar to container 400. In this case however, the extended tab 441 is replaced by a cutout 541 which forms in this case the inactivation configuration which prevents contact with the specific passive actuator.

[0026] Figure 6 illustrates an example container 600. Such container comprises features similar to features already discussed for example in the context of Figure 2 and numbered using the same reference numerals. In this example, the container 600 comprises an additional pair of passive 631 and active 630 actuators, the container comprising for each such additional pair of passive and active actuators a respective additional inactive configuration and a respective additional locking tab, each additional passive actuator and active actuator being paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position, the respective inactivation configuration and locking tab being substantially symmetrically located at 180 degrees from each other around the central axis. In this example, the locking tab corresponding to the additional active actuator 630 is formed by a folded back flank portion 240 which forms both the locking tab of the specific active actuator 230 and of the additional active actuator 630. In this example, the inactivation configuration corresponding to the additional passive actuator 631 is formed by a continuous internal flank side facing and extending beyond the passive actuator 631, such continuous internal flank forming both the inactivation configuration of the specific passive actuator 231 and of the additional active actuator 631. In this examples, a flank comprises all active actuators and no passive actuators, whereby the opposite flank comprises all passive actuators and no active actuators Further additional pairs of passive and active actuators may be provided.

[0027] Figure 7 illustrates an example container 700. Such container comprises features similar to features already discussed for example in the context of Figure 2 and numbered using the same reference numerals. In this example, the container 700 comprises an additional pair of passive 731 and active 730 actuators, the container comprising for each such additional pair of passive and active actuators a respective additional inactive configuration and a respective additional locking tab, each additional passive actuator and additional active actuator being paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position, the respective additional inactivation configuration and additional locking tab being substantially symmetrically located at 180

degrees from each other around the central axis. In this example, the locking tab corresponding to the additional active actuator 730 is formed by a folded back flank portion 740 which forms solely the locking tab of the additional active actuator 730. In this example, the inactivation configuration corresponding to the additional passive actuator 731 is formed by extended tab 741 similar to extended tab 441 described in the context of Figure 4. In this example, opposite lid flanks comprise a same number of passive and active actuators. Further additional pairs of passive and active actuators may be provided.

[0028] As illustrated in a number of examples, each actuator comprises a dedicated flap. In some other examples, some actuators may share a same flap, in particular actuators located on a same side wall. When sharing a same flap, flap flexibility may require applying pressure simultaneously at the different actuators corresponding to the shared flap in order to unlock such actuators.

[0029] Figure 8 illustrates an example container 800. Such container comprises features similar to features already discussed for example in the context of Figure 4 and numbered using the same reference numerals. In this example, the lid of the container comprises a transversal support element 890 extended from a first end 891 of the support element to a second end 892 of the support element along the direction normal to the specific portion 850, whereby the specific active actuator 230 is connected to the specific portion 850 of the sidewall structure, the transversal support element being attached or integrated to the top of the lid, whereby the specific portion 850 is located between the first end 891 and the specific actuation area 280 when the lid is in the closed position, the first end being separated from the specific actuation area by a clearance of less than 1cm and of more than 0.5 mm along the direction normal to the specific portion. This support element permits improving the transmission of a feedback force when pinching the lid with a single adult hand for example. The support element also permits reinforcing the lid structure and the lock structure whereby a part of the sidewall structure slides between the flanks and the support element when the lid is closed. The specific clearance dimension permit pinching the support element when pinching the lid, thereby enabling a direct force feedback in addition to the feedback taking place through the top of the lid itself. One should note that while the support is represented as having a triangular profile or triangular cross section, other profiles or cross sections may be provided while fulfilling the function of the support element. Such a transversal support element is described for example in EP22167961.6, filed on April 12, 2022, incorporated hereby by reference.

[0030] Figure 9 illustrates an example container 900 comprising a double transversal support element in order to provide support across a broader area, such double transversal support element comprising two apexes se-

parated by a distance D1 along a direction parallel to the top of the lid and perpendicular to the direction normal to the specific portion 850, whereby the distance D1 is for example comprised between 50% and 150% of a distance D2 separating centroids of actuation areas such as actuation areas 280 and 382 sharing a same flank. Such transversal support element is described for example in EP23159560.4, filed on March 2, 2023, incorporated hereby by reference.

[0031] Figure 10 illustrates an example container 1000 comprising features similar to features already described hereby and carrying the same reference numeral such as a specific active actuator 230, a specific passive actuator 231, an additional pair of active actuators 332 and 333 and an additional pair of active 630 and passive 631 actuators. In this example, a single adult hand could operate the lock by pressing with thumb active actuator 333 sharing a first flank with passive actuators 231 and 631, such first flank carrying a single actuation area corresponding to active actuator 333 and by simultaneously pressing with three other fingers of the same adult hand active actuators 230, 332 and 630 sharing a same flank opposite to the first flank.

[0032] In some examples, the container comprises a plurality of adjacent actuation areas having respective centroids separated by more than 1cm and by less than 12cm along a direction parallel to the top of the lid and tangential to the sidewall structure, in order to permit operating the corresponding active actuators with fingers of a same adult hand other than the thumb. In some examples, the container comprises a plurality of adjacent actuation areas having respective centroids separated by more than 1.5cm and by less than 9cm along a direction parallel to the top of the lid and tangential to the sidewall structure. In some examples, the container comprises a plurality of adjacent actuation areas having respective centroids separated by more than 1.5cm and by less than 5cm along a direction parallel to the top of the lid and tangential to the sidewall structure.

[0033] In some examples, containers as hereby described are integrated in a consumer product, the consumer product comprising a detergent product and a container according to any of the examples hereby described, whereby the box comprises the detergent product and whereby the container is preferably a cardboard or paperboard container.

[0034] A consumer product should in this disclosure be understood as a product which is provided, among others, to end consumers. Such consumer products may for example be available for purchase in supermarkets and end consumers may store such consumer products in their homes. Consumer products may be provided in large quantities and should thereby be designed taking environmental concerns into account. Consumer products should also be designed taking transportation to a retail store into account. Consumer products should also be designed taking on the shelf storage in a retail store into account. Consumer products should also be

designed taking transportation from a retail store to a consumer home into account. Consumer products should also be designed taking storage at a private end consumer home into account. Consumer products should also be designed taking use of the consumer product at a private end consumer home into account. Consumer products should also be designed taking disposal into account.

[0035] The consumer product according to this disclosure comprises a detergent product. Detergent products should be understood in this disclosure as products comprising a surfactant. Detergent products may also comprise a bleach or other ingredients. Example detergent product compositions are described in more detail herein. In some examples, the detergent product comprises unit dose detergent pouches, preferably water-soluble unit dose detergent pouches, more preferably flexible water-soluble unit dose detergent pouches. Example unit dose detergent pouches are described in more detail herein.

[0036] In some examples, the consumer product comprises at least one water-soluble unit dose article and the container. The consumer product can be sold 'as is', in other words the consumer product is the item that the consumer picks up from the shelf. Alternatively, the consumer product could be housed as one unit of a multi-component product. For example, more than one consumer product could be housed within an outer package and the multiple packaged consumer products sold together in a single purchase. The consumer product may comprise aesthetic elements, for example shrink sleeves or labels attached to the container. Alternatively, the container may be coloured or printed with aesthetic elements or informative print such as usage instructions.

[0037] In some examples a water-soluble unit dose article comprises at least one water-soluble film orientated to create at least one-unit dose internal compartment, wherein the at least one-unit dose internal compartment comprises a detergent composition. The water-soluble film and the detergent composition are described in more detail below. In some examples the consumer product comprises at least one water-soluble unit dose article, in some cases at least two water-soluble unit dose articles, in some cases at least 10 water-soluble unit dose articles, in some cases at least 20 water-soluble unit dose articles, in some cases at least 30 water-soluble unit dose articles, in some cases at least 40 water-soluble unit dose articles, in some cases at least 45 water-soluble unit dose articles. A water-soluble unit dose article is in some examples in the form of a pouch. A water-soluble unit dose article comprises in some examples a unitary dose of a composition as a volume sufficient to provide a benefit in an end application. The water-soluble unit dose article comprises in some examples one water-soluble film shaped such that the unit-dose article comprises at least one internal compartment surrounded by the water-soluble film. The at least one compartment comprises a cleaning composition. The water-soluble film is sealed

such that the cleaning composition does not leak out of the compartment during storage. However, upon addition of the water-soluble unit dose article to water, the water-soluble film dissolves and releases the contents of the internal compartment into the wash liquor. The unit dose article may comprise more than one compartment, at least two compartments, or at least three compartments, or at least four compartments, or even at least five compartments. The compartments may be arranged in superposed orientation, i.e. one positioned on top of the other. Alternatively, the compartments may be positioned in a side-by-side orientation, i.e. one orientated next to the other. The compartments may be orientated in a 'tyre and rim' arrangement, i.e. a first compartment is positioned next to a second compartment, but the first compartment at least partially surrounds the second compartment, but does not completely enclose the second compartment. Alternatively, one compartment may be completely enclosed within another compartment. In some examples the unit dose article comprises at least two compartments, one of the compartments being smaller than the other compartment. In some examples the unit dose article comprises at least three compartments, two of the compartments may be smaller than the third compartment, and in some examples the smaller compartments being superposed on the larger compartment. The superposed compartments are in some examples orientated side-by-side. In some examples each individual unit dose article may have a weight of between 10g and 40g, or even between 15g and 35g. The water-soluble film may be soluble or dispersible in water. Prior to being formed into a unit dose article, the water-soluble film has in some examples a thickness of from 20 to 150 micron, in other examples 35 to 125 micron, in further examples 50 to 110 micron, in yet further examples about 76 micron. Example water soluble film materials comprise polymeric materials. The film material can, for example, be obtained by casting, blow-moulding, extrusion or blown extrusion of the polymeric material. In some examples, the water-soluble film comprises polyvinyl alcohol homopolymer or polyvinyl alcohol copolymer, for example a blend of polyvinylalcohol homopolymers and/or polyvinylalcohol copolymers, for example wherein the polyvinyl alcohol copolymers are selected from sulphonated and carboxylated anionic polyvinylalcohol copolymers especially carboxylated anionic polyvinylalcohol copolymers, for example the water-soluble comprises a blend of a polyvinylalcohol homopolymer and a carboxylated anionic polyvinylalcohol copolymer, or alternatively a blend of polyvinyl alcohol homopolymers. Alternatively the polyvinyl alcohol in the water-soluble film consists of an anionic polyvinylalcohol copolymer, especially a carboxylated polyvinylalcohol copolymer. In some examples water soluble films are those supplied by Monosol under the trade references M8630, M8900, M8779, M8310. In some examples the film may be opaque, transparent or translucent. The film may comprise a printed area. The area of print may be achieved using techniques such as

flexographic printing or inkjet printing. The film may comprise an aversive agent, for example a bittering agent. Suitable bittering agents include, but are not limited to, naringin, sucrose octaacetate, quinine hydrochloride, denatonium benzoate, or mixtures thereof. Example levels of aversive agent include, but are not limited to, 1 to 5000ppm, 100 to 2500ppm, or 250 to 2000ppm. The water-soluble film or water-soluble unit dose article or both may be coated with a lubricating agent. In some examples, the lubricating agent is selected from talc, zinc oxide, silicas, siloxanes, zeolites, silicic acid, alumina, sodium sulphate, potassium sulphate, calcium carbonate, magnesium carbonate, sodium citrate, sodium triphosphate, potassium citrate, potassium triphosphate, calcium stearate, zinc stearate, magnesium stearate, starch, modified starches, clay, kaolin, gypsum, cyclodextrins or mixtures thereof.

[0038] In some examples the container comprises a first part, wherein the first part comprises a first compartment in which the at least one water-soluble unit dose article is contained. In some examples the first compartment comprises at least two water-soluble unit dose articles. The first compartment may comprise between 1 and 80 water-soluble unit dose articles, between 1 and 60 water-soluble unit dose articles, between 1 and 40 water-soluble unit dose articles, or between 1 and 20 water-soluble unit dose articles. The volume of the first compartment may be between 500ml and 5000ml, in some examples between 800ml and 4000ml.

[0039] In some examples the detergent product comprises a detergent composition. The detergent composition may be a laundry detergent composition, an automatic dishwashing composition, a hard surface cleaning composition, or a combination thereof. The detergent composition may comprise a solid, a liquid or a mixture thereof. The term liquid includes a gel, a solution, a dispersion, a paste, or a mixture thereof. The solid may be a powder. By powder we herein mean that the detergent composition may comprise solid particulates or may be a single homogenous solid. In some examples, the powder detergent composition comprises particles. This means that the powder detergent composition comprises individual solid particles as opposed to the solid being a single homogenous solid. The particles may be free-flowing or may be compacted. A laundry detergent composition can be used in a fabric hand wash operation or may be used in an automatic machine fabric wash operation, for example in an automatic machine fabric wash operation. Example laundry detergent compositions comprise a non-soap surfactant, wherein the non-soap surfactant comprises an anionic non-soap surfactant and a non-ionic surfactant. In some examples, the laundry detergent composition comprises between 10% and 60%, or between 20% and 55% by weight of the laundry detergent composition of the non-soap surfactant. Example weight ratio of non-soap anionic surfactant to nonionic surfactant are from 1:1 to 20:1, from 1.5:1 to 17.5:1, from 2:1 to 15:1, or from 2.5:1 to 13:1. Example

non-soap anionic surfactants comprises linear alkylbenzene sulphonate, alkyl sulphate or a mixture thereof. Example weight ratio of linear alkylbenzene sulphonate to alkyl sulphate are from 1:2 to 9:1, from 1:1 to 7:1, from 1:1 to 5:1, or from 1:1 to 4:1. Example linear alkylbenzene sulphonates are C₁₀-C₁₆ alkyl benzene sulfonic acids, or C₁₁-C₁₄ alkyl benzene sulfonic acids. By 'linear', we herein mean the alkyl group is linear. Example alkyl sulphate anionic surfactant may comprise alkoxylated alkyl sulphate or non-alkoxylated alkyl sulphate or a mixture thereof. Example alkoxylated alkyl sulphate anionic surfactant comprise an ethoxylated alkyl sulphate anionic surfactant. Example alkyl sulphate anionic surfactant may comprise an ethoxylated alkyl sulphate anionic surfactant with a mol average degree of ethoxylation from 1 to 5, from 1 to 3, or from 2 to 3. Example alkyl sulphate anionic surfactant may comprise a non-ethoxylated alkyl sulphate and an ethoxylated alkyl sulphate wherein the mol average degree of ethoxylation of the alkyl sulphate anionic surfactant is from 1 to 5, from 1 to 3, or from 2 to 3. Example alkyl fraction of the alkyl sulphate anionic surfactant are derived from fatty alcohols, oxo-synthesized alcohols, Guerbet alcohols, or mixtures thereof. In some examples, the laundry detergent composition comprises between 10% and 50%, between 15% and 45%, between 20% and 40%, or between 30% and 40% by weight of the laundry detergent composition of the non-soap anionic surfactant. In some examples, the non-ionic surfactant is selected from alcohol alkoxylate, an oxo-synthesised alcohol alkoxylate, Guerbet alcohol alkoxylates, alkyl phenol alcohol alkoxylates, or a mixture thereof. In some examples, the laundry detergent composition comprises between 0.01% and 10%, between 0.01% and 8%, between 0.1% and 6%, or between 0.15% and 5% by weight of the liquid laundry detergent composition of a non-ionic surfactant. In some examples, the laundry detergent composition comprises between 1.5% and 20%, between 2% and 15%, between 3% and 10%, or between 4% and 8% by weight of the laundry detergent composition of soap, in some examples a fatty acid salt, in some examples an amine neutralized fatty acid salt, wherein in some examples the amine is an alkanolamine for example selected from monoethanolamine, diethanolamine, triethanolamine or a mixture thereof, in some examples monoethanolamine. In some examples, the laundry detergent composition is a liquid laundry detergent composition. In some examples the liquid laundry detergent composition comprises less than 15%, or less than 12% by weight of the liquid laundry detergent composition of water. In some examples, the laundry detergent composition is a liquid laundry detergent composition comprising a non-aqueous solvent selected from 1,2-propanediol, dipropylene glycol, tripropyleneglycol, glycerol, sorbitol, polyethylene glycol or a mixture thereof. In some examples, the liquid laundry detergent composition comprises between 10% and 40%, or between 15% and 30% by weight of the liquid laundry detergent com-

position of the non-aqueous solvent. In some examples, the laundry detergent composition comprises a perfume. In some examples, the laundry detergent composition comprises an adjunct ingredient selected from the group comprising builders including enzymes, citrate, bleach, bleach catalyst, dye, hueing dye, brightener, cleaning polymers including alkoxylated polyamines and polyethyleneimines, soil release polymer, surfactant, solvent, dye transfer inhibitors, chelant, encapsulated perfume, polycarboxylates, structurant, pH trimming agents, and mixtures thereof. In some examples, the laundry detergent composition has a pH between 6 and 10, between 6.5 and 8.9, or between 7 and 8, wherein the pH of the laundry detergent composition is measured as a 10% product concentration in demineralized water at 20°C. When liquid, the laundry detergent composition may be Newtonian or non-Newtonian. In some examples, the liquid laundry detergent composition is non-Newtonian. Without wishing to be bound by theory, a non-Newtonian liquid has properties that differ from those of a Newtonian liquid, more specifically, the viscosity of non-Newtonian liquids is dependent on shear rate, while a Newtonian liquid has a constant viscosity independent of the applied shear rate. The decreased viscosity upon shear application for non-Newtonian liquids is thought to further facilitate liquid detergent dissolution. The liquid laundry detergent composition described herein can have any suitable viscosity depending on factors such as formulated ingredients and purpose of the composition.

[0040] The container is preferably a cardboard or paperboard container.

[0041] Paperboard or cardboard is, mechanically speaking, a relatively flexible material, meaning that a wall of a container made of paperboard or cardboard may offer little resistance to getting bent under an external pressure. In some applications where resistance to getting bent and/or high tear resistance is of importance, a material different from paperboard or cardboard may be used. Materials different from paperboard or cardboard may however not be as straightforward to recycle. Such choice of material thereby results of a compromise. An objective of the present disclosure is to propose a container comprising a lid, whereby the inclusion of a reinforced lid corner leads to reinforcement of the whole container structure, permitting use of paperboard or cardboard in applications which would otherwise be compromised by using another material.

[0042] As the container according to this description may be shaped using folding machinery which is likely to be already in place at a manufacturing location, little or no additional capital is required at a manufacturing location to implement the structures according to this disclosure.

[0043] A lid, box or container according to this disclosure may be made from paper material wherein the paper material is for example selected from paperboard, cardboard, laminates comprising at least one paper board or cardboard layer. Paperboard or cardboard comprise cellulose fibre materials or a mixture thereof. The material

used to make the lid, box or container may comprise other ingredients, such as colorants, protective varnishes, surface enhancement coatings, barrier coatings, preservatives, recycled fibre materials, plasticisers, UV stabilizers, oxygen barriers, perfume barriers, and moisture barriers, or a mixture thereof. In some examples, in order to provide a desired tear resistance and strength, cellulose fibres lengths is in a range from 0.1 to 5mm, preferably from 1 to 3mm. In some examples, cellulose fibres are sourced from various sources such as virgin soft or hard woods, hemp, grass, corn, bagasse, sugarcane, bamboo and others, and/or from post producer or post-consumer recycled paper and cardboard.

[0044] The lid, box or container may comprise areas of external or internal printing. The lid, box or container may be made for example by cardboard making. Suitable lid, box or container manufacturing processes may include, but are not limited to, tube forming from a flat cardboard or paperboard sheet with a gluing step, folding, or a mixture thereof. The lid, box or container may be opaque or filter some specific wavelengths, for example to protect content from external light. In some examples the lid, box or container is constructed at least in part and in some specific examples in its entirety from paper-based material. By paper-based material, we herein mean a material comprising paper. Without wishing to be bound by theory, by 'paper' we herein mean a material made from a cellulose-based pulp. Paperboard may be made from a paper-based material having a thickness and rigidity such that it does not collapse under its own weight. While paperboard should be understood as comprising a single layer of material, cardboard should be understood as comprising a plurality of paper-based material layers. In some examples, the paper-based material comprises paperboard, cardboard, or a mixture thereof, wherein preferably, cardboard comprises paperboard, corrugated fiber-board, or a mixture thereof. Corrugated fiber-board comprises a series of flutes. Each flute can be understood to be a channel. The flutes run parallel to one another, with the flute direction being the direction travelled along each channel. The paper-based material may be a laminate comprising paper, cardboard, or a mixture thereof, wherein in some examples, cardboard comprises paperboard, corrugated fiber-board, or a mixture thereof, and in some examples at least another material. In some examples, the at least another material comprises a plastic material. In some examples, the plastic material comprises polyethylene, more specifically Low Density PolyEthylene (LDPE), polyethylene terephthalate, polypropylene, polyvinylalcohol or a mixture thereof. In some examples the plastic material comprises a copolymer from an ethylene starting monomer and vinyl alcohol, or EVOH. A barrier material may be used as the at least another material. The barrier material may be a biaxially orientated polypropylene, a metallised polyethylene terephthalate, or a mixture thereof. The at least another material may comprise a wax, a cellulose material, polyvinylalcohol, silica dioxide, casein based

materials, or a mixture thereof. In some examples, the paper-based laminate comprises greater than 50%, preferably greater than 85%, and more preferably greater than 95% by weight of the paper based laminate of fiber-based materials. In some examples, the barrier material may comprise plastic material having a thickness of between 10 micron and 60 micron. In some examples, the barrier material may comprise plastic material having a thickness of between 10 micron and 35 micron. The paper-based material may be a laminate. In some examples, the internal surface of a lid, box or container comprises paperboard, cardboard, or a mixture thereof, wherein, in specific examples, cardboard comprises paperboard, corrugated fiber-board and lamination of polyethylene, especially LDPE, or a mixture thereof, and, in some examples, the external surface of the lid, box or container or a combination thereof comprises the at least another material. Alternatively, the at least another material might also be laminated in-between two paper-based material layers such as the paperboard or cardboard layers as per this disclosure. Without wishing to be bound by theory this at least another material might act as a barrier for leaked liquid absorbed by the paper-based material facing the interior side of the lid, box or container, to prevent or reduce a contaminating flow through a wall of the lid, box or container. Other structures may be found efficient to avoid leakage from the content or to protect the content from external fluids, for example from a shower, a sink, or by handling the container or the lid with wet hands. Contamination of a wall of the lid, box or container might be unsightly to consumers or may contaminate the storage area. In some examples, the lid, box or container are made of a paper-based material comprising the at least another material laminated in between two corrugated fiberboard layers. In some examples, the material used for the lid, box or container comprises a core cardboard flute material sandwiched between two plain cardboard (or paperboard) layers and polyethylene laminate. A paperboard or cardboard layer according to this disclosure may be made from or comprise recycled material or recycled cellulose fibres. The external surface of the lid, box or container may comprise a coating or a varnish. Such a coating or varnish can help making a board repellent to water or help protecting a content such as an enclosed detergent composition from UV light. The coating or varnish could also help protecting the external surface of the lid, box or container from being contaminated by the content, for example an enclosed detergent composition, for example if leakage of a water-soluble unit dose detergent enclosing a liquid detergent composition would occur.

[0045] A coating or varnish on the internal surface can help to prevent the content to stick to the inner surface or prevent migration of inks, colorants, perfumes, non-ionics, oils, greases and other ingredients from the content into the board or inks or additives from the board onto the content. In some examples detergent resistant varnishes or coatings can be applied on areas exposed to the

contents.

[0046] Figure 11 illustrates an example method 1100 for operating a locked container or a locked consumer product according to any of the examples hereby described. Such example method 1100 comprises, in block 1101, unlocking of the container or consumer product by applying the actuation pressure on the specific active actuator through the specific actuation area. One should note that in some examples, the lock comprises one or more additional active actuators whereby unlocking of the container or consumer product would take place by applying the actuation pressure on such one or more additional active actuators through their corresponding actuation areas, doing so simultaneously for all active actuators, preferably using a single adult hand. Example method 1100 further comprises, in block 1102, in response to the first unlocking according to block 1101, rotating the lid of the open box 180 degrees in relation to the open box around the central axis. One should note that block 1102 is likely to take place without a user realising that they are actually rotating the lid, which is a reversible lid. A user may have opened the container according to block 1101 to access the container content and may for example have laid the lid on the floor, on a table or on a countertop surface, and may thereafter place the lid on the box to reclose the box without realizing that the placement of the lid gets inverted. If this occurs, the specific design of the containers according to this disclosure would turn into "passive actuators" actuators which otherwise may lock the container without possibility to reopen such container, or which otherwise may render unlocking difficult, for example due to actuation areas being located in a non-symmetrical manner on the lid whereas actuators would be located in a symmetrical manner on the box. Such lack of symmetry of actuation area placement on the lid would for example reflect the fact that a single human hand is by nature not symmetrical. Example method 1100 further comprises, in block 1103, in response to rotating the lid as per block 1102, reclosing the box, whereby the actuator acting during the first unlocking according to block 1101 as active actuator acts during the reclosing according to block 1103 as passive actuator, and whereby the actuator acting during the first unlocking as passive actuator acts during the reclosing as active actuator. Such role shift between passive and active actuators would also occur for additional actuators which are paired as active and passive actuator pairs. As illustrated for example in figures 3, 4 or 10, some additional actuators may indeed be paired to remain active regardless of the lid orientation (see actuator pair 332 and 333 for example).

[0047] In some example methods, whereby the example container comprises a single additional pair of active actuators, whereby a specific flank comprises one of the respective additional actuation areas, such respective additional actuation area being a single actuation area of the specific flank, whereby the lid of the example container comprises a flank opposite to the specific flank, such

opposite flank comprising the specific actuation area and an additional actuation area paired with the single actuation area of the specific flank, as illustrated for example in figures 3, 4, 5, 8 or 9, the actuation pressure on the single actuation area is applied by a thumb of an adult hand, whereby the actuation pressure on the specific actuation area and on the additional actuation area paired with the single actuation area of the specific flank is simultaneously applied by two fingers of the adult hand other than the thumb.

[0048] Figures 12A-D illustrate a combination of example blanks, in particular an example box blank 1210, a first example lid blank 1220, another example lid blank 1230, and a transversal support element lid blank 1240. Such example blanks are made using fluted cardboard having flutes running parallel to direction 1250. Example blank 1210 may for example be used to make a box as illustrated in any of figures 3 to 9. Example blanks 1220 or 1230 may for example be used to make a lid as illustrated in any of figures 4, 8 or 9 having different flank heights. Example lid blank 1240 may be used to make an example transversal support element as illustrated for example in figure 9.

[0049] Example combinations of a box blank and of a lid blank may indeed be provided, whereby the box blank is configured to be folded into the box of any of the above container examples, and whereby the lid blank is configured to be folded into the lid of any of the respective container examples.

[0050] An example box blank, such as example blank 1210, comprises one or more flap pairs corresponding to actuator pairs, whereby each flap pair comprises a first flap 230 in a first sidewall panel and a second flap 231 in a second sidewall panel of the box blank. Example blank 1210 is illustrated with the flaps being numbered corresponding to a possible box configuration, taking into account that such box configuration and distribution of active and passive actuators would depend on the lid orientation.

[0051] An example lid blank, such as either lid blank 1220 or lid blank 1230, comprises at least one inactivation configuration 441 and one or more locking tabs 240 (which in this example provides a double locking tab as illustrated in Figure 4 for example) and 343, and one or more actuation areas 280, 382 and 383, corresponding to the one or more locking tabs, whereby each inactivation configuration 441, each locking tab 240 and 343 and each actuation area is configured to respectively correspond to a respective flap 231, 230, 232 and 333 of the one or more flap pairs illustrated in blank 1210, the lid blank comprising a first flank panel, a top panel and a second flank panel separated in this order by parallel fold lines, the corresponding actuation areas being comprised in the flank panels, whereby the at least one inactivation configuration 441 and the corresponding locking tab are placed to be substantially symmetrically located at 180 degrees from each other around a central axis of the top of the lid when the lid is formed. The lid

blank further comprises flaps permitting holding the panels together.

[0052] In some examples, the lid blank is made from a multilayer material comprising the following layers, in this order: GD2 210 (95%), HPF 140 (85%), and BK 170 (0%), the GD 210 layer facing the outside of the container when the container is closed.

[0053] In some examples, the transversal support element is made from a single layer of GK 600 (0%).

[0054] In some examples, the box blank is made from a multilayer material comprising the following layers, in this order: GD2 210 (95%), HPF 140 (85%), W112 (95%), PE 15 (0%) and W 112 (95%), the GD 210 layer facing the outside of the container when the container is closed.

[0055] In the three paragraphs directly above, GD2 should be understood as Gestrichenen Duplex (a German classification codes for boards) corresponding to recycled board with a clay top coating for printing. HPF should be understood as High performance F-flute, a particularly resistant version of F-flute which forms in some examples a middle corrugated layer. BK should be understood as Bleached Kraft board, a robust and tear resistant virgin fibre board which is bleached for appearance and printing. W should be understood as a white liner. PE stands for polyethylene. The numbers 210, 140, 170 and 112 following the letter codes of the materials are weight in grams per square meter of material. Between brackets is the amount of recycled content.

[0056] The container may be made from rigid paperboard or cardboard material, flexible paperboard or cardboard material or a mixture thereof. In some examples, the layer material forming the box or the lid has a wall thickness of more than 300 microns and of less than 6mm per layer. In some examples, the layer material forming the box or the lid has a wall thickness of more than 1mm and of less than 2mm per layer. The container may be made from paper materials, bio-based material, bamboo fibres, cellulose fibres, cellulose based or fibre-based materials, or a mixture thereof. The container may be made from materials comprising recycled materials, for example recycled cellulose fiber-based materials. In some examples, the container is made from C (3.2mm) flute corrugated cardboard. In some examples, the container is made from double wall cardboard, in some examples made from double wall cardboard up to 5mm thick per double wall layer.

[0057] In some examples the flanks of the lid cover about 30% of the sidewall structure of the box, 30% corresponding in this case to a ratio between on one hand a height of the flanks in a direction normal to both the top of the lid and the base of the box and on the other hand the height of the sidewalls in the direction normal to both the top of the lid and the base of the box. In an example, the flanks completely surround the sidewalls around the opening. Such coverage of the flanks participates in ensuring lid placement, structural resiliency and protection of the content. In some examples, the flanks cover at least 50% of the sidewalls when the lid is in the closed

position. In some examples, the flanks cover at least 75% of the sidewalls when the lid is in the closed position. In some examples, the flanks cover at least 90% of the sidewalls when the lid is in the closed position. In some examples, the flanks cover 100% of the sidewalls when the lid is in the closed position. Increasing flank coverage increases robustness. In some examples, the flanks cover at most 90% of the sidewalls when the lid is in the closed position. In some examples, the flanks cover at most 80% of the sidewalls when the lid is in the closed position. In some examples, the flanks cover at most 70% of the sidewalls when the lid is in the closed position. Decreasing flank coverage can ease opening of the container by providing grip surface on both the lid and the box sidewalls. In some examples, a manufacturing process comprises providing different box sizes, for example boxes having a sidewall height of either 10cm, 11.5 cm, 13.5 cm or 16cm, whereby each box may be provided with a same lid fitting all box sizes provided, such as a lid having a flank height of 7 cm. In some examples, flank height is of more than 3cm. In some examples, flank height is of more than 5cm. In some examples, flank height is of more than 6cm. In some examples, flank height is of 9cm or more. In some examples, flank height is of 12cm or more. In some examples, sidewalls of the box have a sidewall height along a direction perpendicular to the base of 30 cm or more. In some examples, sidewalls of the box have a sidewall height along a direction perpendicular to the base of up to 40 cm.

[0058] In some examples, reinforced lid corners may be provided by folding a double layer, in which reinforced corners may comprise cut-out features such as described in pending patent application EP22214415.6 integrated hereby by reference.

[0059] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

[0060] Every document cited herein, including any cross referenced or related patent or application, is hereby incorporated herein by reference in its entirety unless expressly excluded or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

[0061] While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without depart-

ing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

Claims

1. A container comprising a box, a reversible lid for the box, and a lock to maintain the lid in a closed position, the box comprising a base, a sidewall structure and an opening opposite to the base, the lid comprising a top and flanks, the top covering the opening when the lid is in the closed position, whereby the top is substantially 180 degrees symmetrical around a central axis normal to the top, whereby at least a portion of the flanks covers at least a specific portion of the sidewall structure of the box when the lid is in the closed position, the lock comprising a specific active actuator moveable from a locking position to an opening position by applying an actuation pressure onto the specific active actuator when the lid is in the closed position, whereby the specific active actuator is connected to the specific portion of the sidewall structure, whereby the specific active actuator abuts against a corresponding locking tab of the lid when in the locking position, the specific active actuator being displaceable by the actuation pressure by an unlocking displacement distance in a direction normal to the specific portion of the sidewall structure, whereby the flanks comprise a specific actuation area, the actuation area facing the specific active actuator, the specific actuation area being configured to permit displacing the specific active actuator from the locking position to the opening position by applying the actuation pressure at the specific actuation area when the lid is in the closed position, the box comprising a specific passive actuator connected to a second portion of the sidewall structure, the specific passive actuator and the specific active actuator being paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position, whereby the specific passive actuator is inactivated by a specific inactivation configuration of the lid when the lid is in the closed position, the specific inactivation configuration and the locking tab corresponding to the specific active actuator being substantially symmetrically located at 180 degrees from each other around the central axis.
2. The container according to claim 1, whereby the container comprises one or more additional pair of active actuators, the container comprising for each such additional pair of active actuators respective additional locking tabs and respective additional actuation areas, each additional active actuator of each pair being paired to be substantially symme-

- trically located at 180 degrees from each other around the central axis when the lid is in the closed position, the respective additional locking tabs being substantially symmetrically located at 180 degrees from each other around the central axis. 5
3. The container according to the above claims, the container comprising a single additional pair of active actuators, whereby a specific flank comprises one of the respective additional actuation areas, such respective additional actuation area being a single actuation area of the specific flank. 10
 4. The container according to the above claim, whereby the single actuation area of the specific flank is located off-center of the specific flank. 15
 5. The container according to the above claim, whereby the single actuation area of the specific flank is located on the left hand side of the specific flank from the point of view of an observer of the specific flank when the box sits upright with the lid in the closed position. 20
 6. The container according to any of claims 3 to 5, whereby the lid comprises a flank opposite to the specific flank, such opposite flank comprising the specific actuation area and the additional actuation area paired with the single actuation area of the specific flank. 25
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 7. The container according to any of the above claims 1 or 2, whereby the container comprises one or more additional pair of passive and active actuators, the container comprising for each such additional pair a respective additional inactive configuration and a respective additional locking tab, each additional passive actuator and additional active actuator being paired to be substantially symmetrically located at 180 degrees from each other around the central axis when the lid is in the closed position, the respective additional inactivation configuration and respective additional locking tab being substantially symmetrically located at 180 degrees from each other around the central axis. 35
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 8. The container according to any of the above claims, whereby each inactivation configuration generates pressure on the specific passive actuator when the lid is in the closed position, or prevents contact with the specific passive actuator when the lid is in the closed position. 50
 9. The container according to any of the above claims, whereby each actuation element is an aperture. 55
 10. The container according to any of the above claims, whereby each actuator comprises a dedicated flap.
 11. The container according to any of the above claims, whereby the lid comprises a transversal support element extended from a first end of the support element to a second end of the support element along the direction normal to the specific portion, the support element being attached or integrated to the top of the lid, whereby the specific portion is located between the first end and the specific actuation area when the lid is in the closed position, the first end being separated from the specific actuation area by a clearance of less than 1cm and of more than 0.5 mm along the direction normal to the specific portion.
 12. The container according to any of the above claims, the container comprising a plurality of adjacent actuation areas having respective centroids separated by more than 1cm and by less than 12cm along a direction parallel to the top of the lid and tangential to the sidewall structure.
 13. A consumer product comprising a detergent product and a container according to any of the above claims, whereby the box comprises the detergent product and whereby the container is preferably a cardboard or paperboard container.
 14. A method to operate a locked container or a locked consumer product according to any of the above claims, the method comprising:
unlocking of the container or consumer product by applying the actuation pressure on the specific active actuator through the specific actuation area;
in response to the first unlocking, rotating the lid of the open box 180 degrees in relation to the open box around the central axis;
in response to rotating the lid, reclosing the box, whereby the actuator acting during the first unlocking as active actuator acts during the reclosing as passive actuator, and whereby the actuator acting during the first unlocking as passive actuator acts during the reclosing as active actuator.
 15. The method according to the above claim, whereby the container is according to claim 6, whereby the actuation pressure on the single actuation area is applied by a thumb of an adult hand, and whereby the actuation pressure on the specific actuation area and on the additional actuation area paired with the single actuation area of the specific flank is simultaneously applied by two fingers of the adult hand other than the thumb.
 16. A combination of a box blank and of a lid blank, whereby the box blank is configured to be folded into the box of any of the above container claims, and

whereby the lid blank is configured to be folded into the lid of any of the above container claims, whereby:

the box blank comprises one or more flap pairs corresponding to actuator pairs, whereby each flap pair comprises a first flap in a first sidewall panel and a second flap in a second sidewall panel of the box blank; and
the lid blank comprises at least one inactivation configuration and one or more locking tabs and one or more actuation areas corresponding to the one or more locking tabs, whereby each inactivation configuration, each locking tab and each actuation area is configured to respectively correspond to a respective flap of the one or more flap pairs, the lid blank comprising a first flank panel, a top panel and a second flank panel separated in this order by parallel fold lines, the corresponding actuation area(s) being comprised in the flank panels, whereby the at least one inactivation configuration and the corresponding one or more locking tabs of each pair are placed to be substantially symmetrically located at 180 degrees from each other around a central axis of the top of the lid when the lid is formed.

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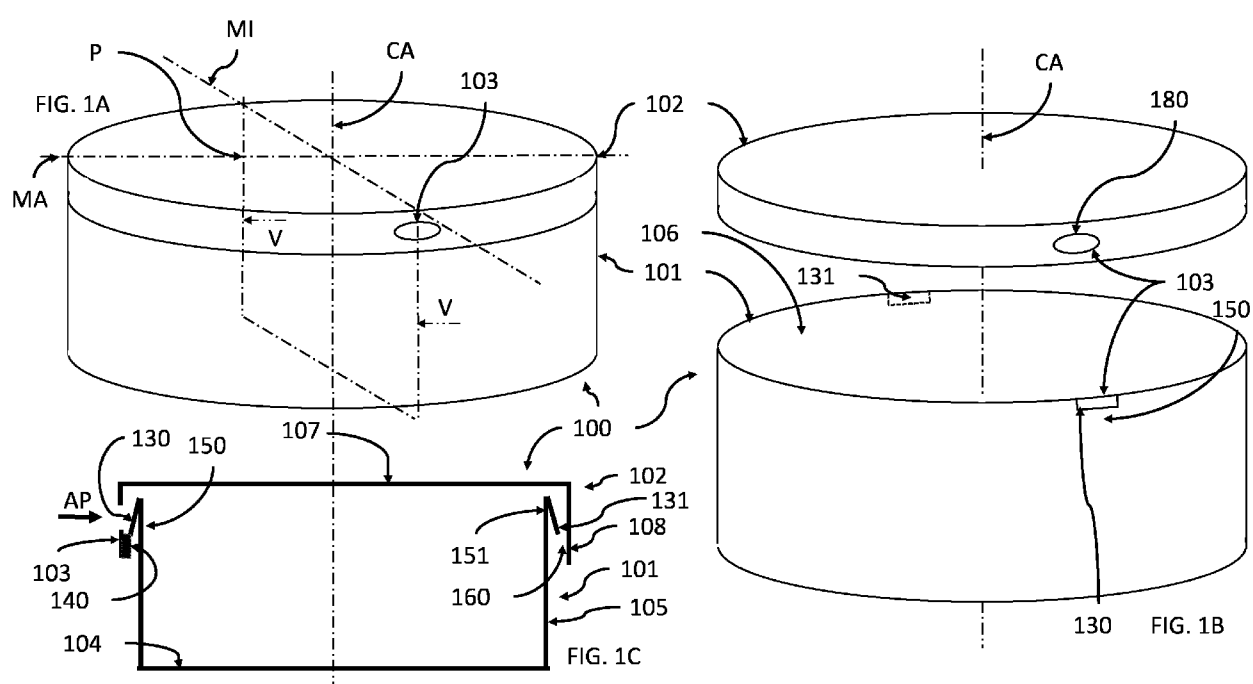
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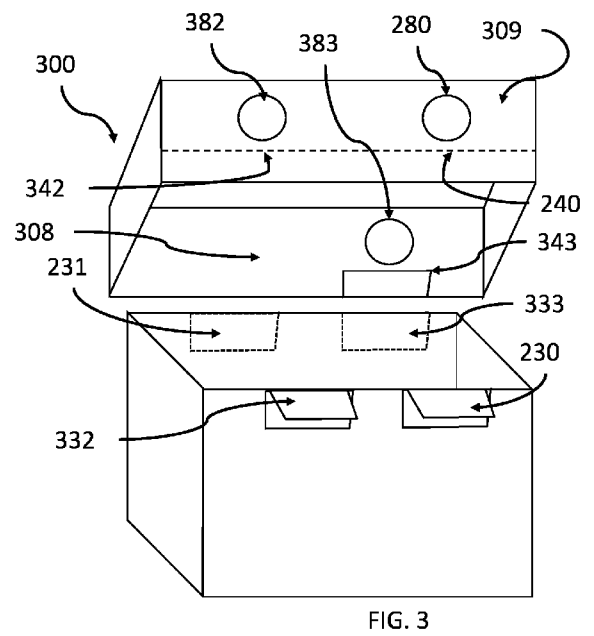
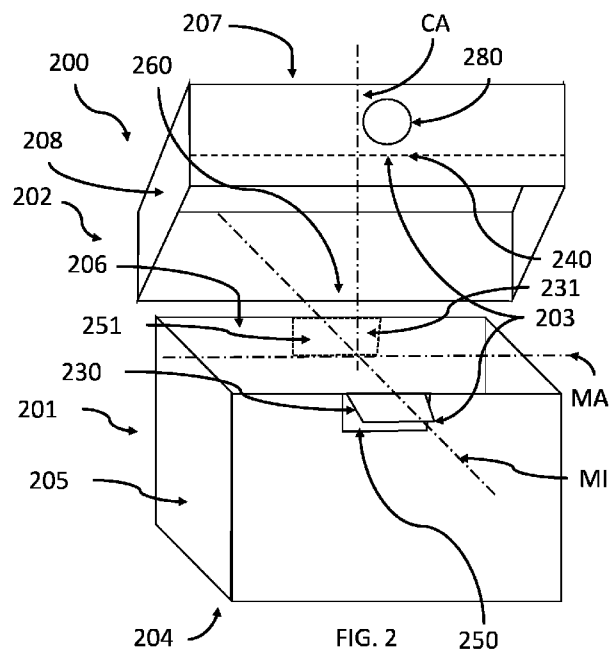
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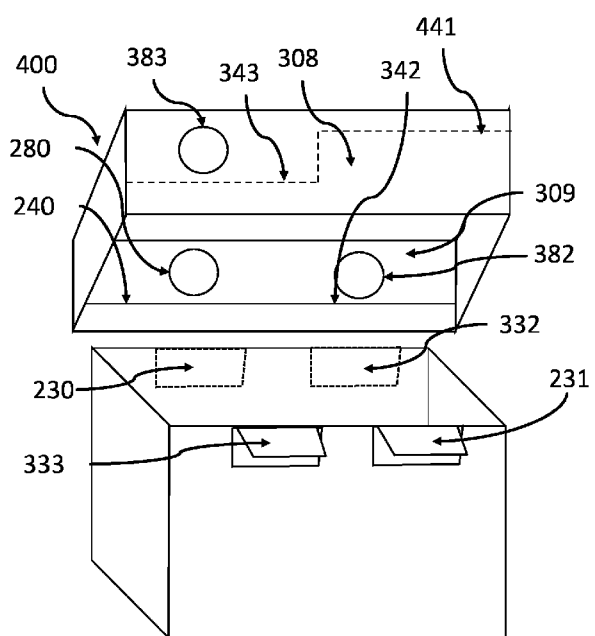


FIG. 4

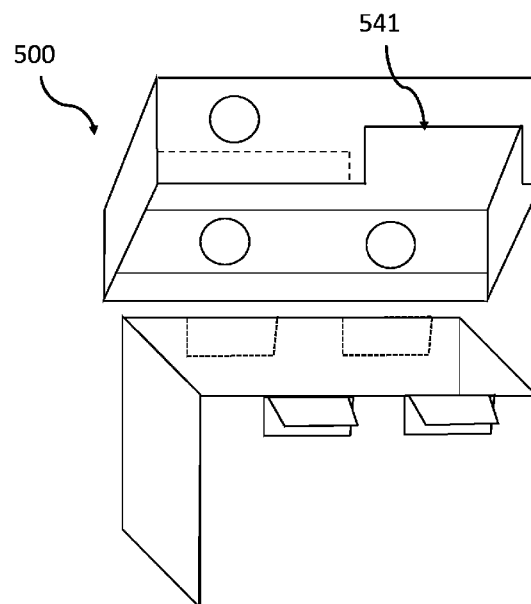


FIG. 5

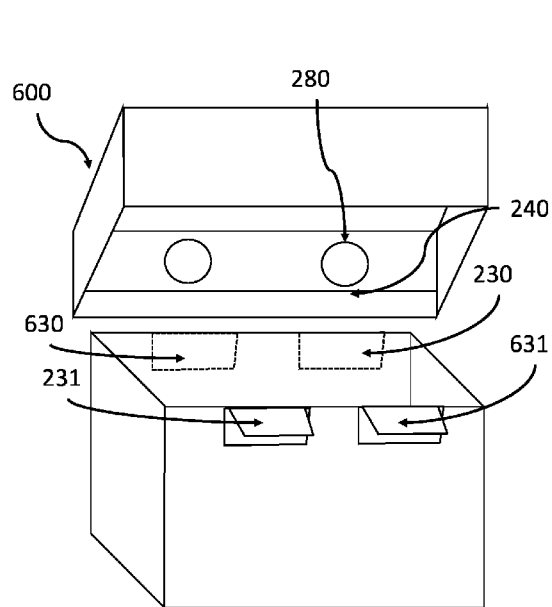


FIG. 6

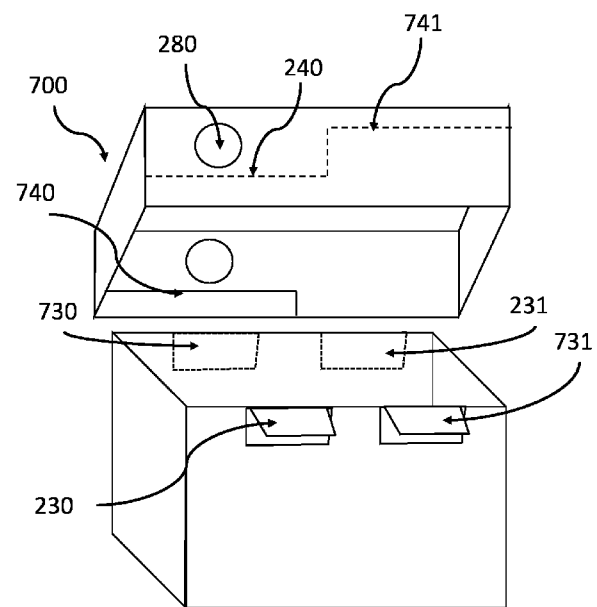


FIG. 7

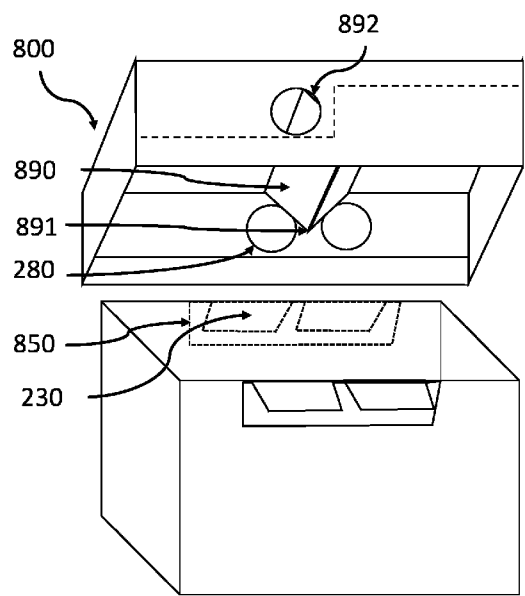


FIG. 8

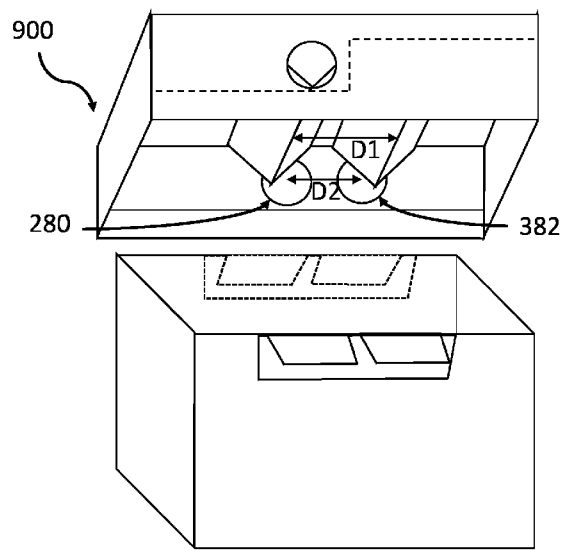


FIG. 9

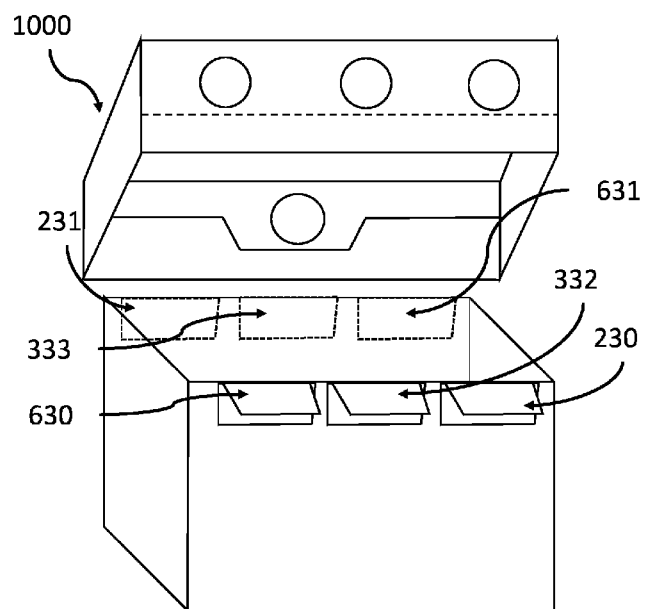


FIG. 10

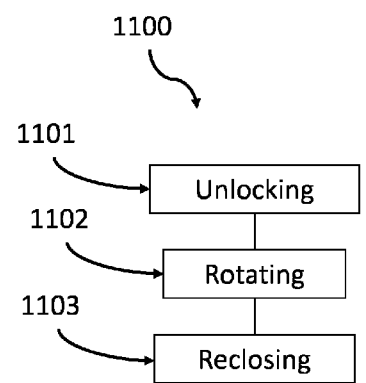
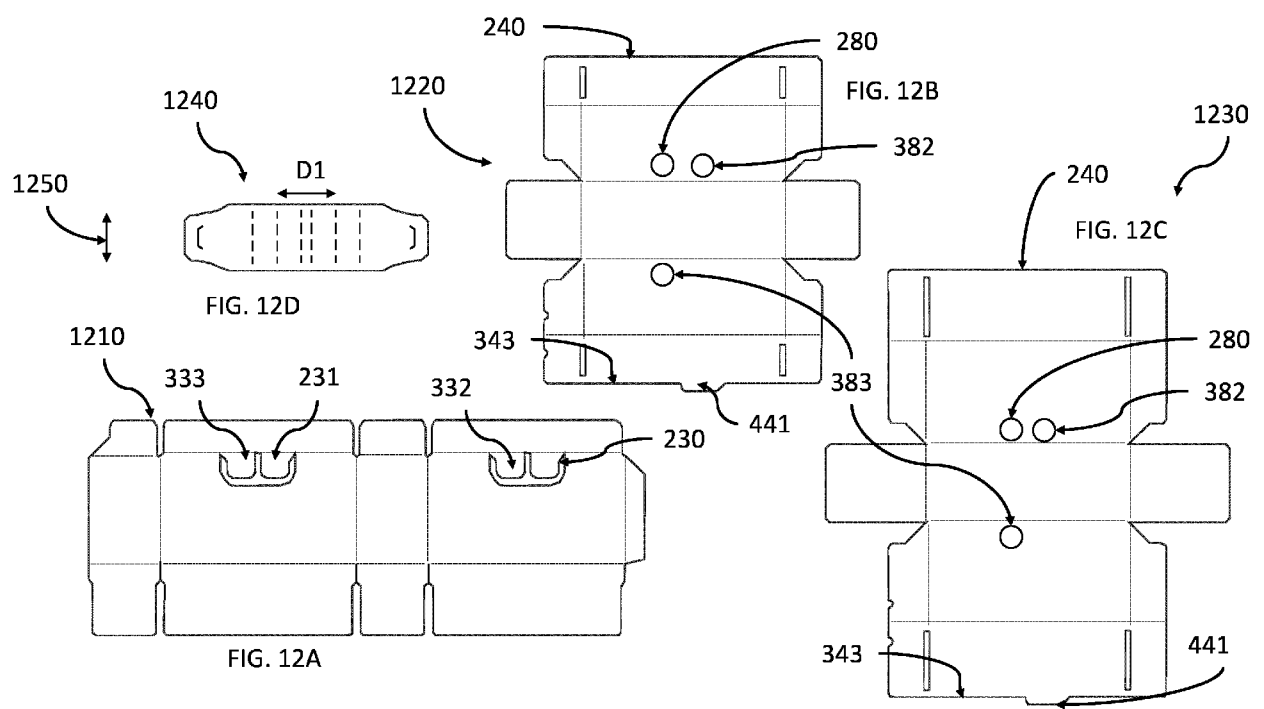


FIG. 11





EUROPEAN SEARCH REPORT

Application Number

EP 23 19 8196

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2022/173682 A1 (PROCTER & GAMBLE [US]) 18 August 2022 (2022-08-18) * figure 6 * -----	1-16	INV. B65D5/68 B65D43/02 B65D50/04
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		6 February 2024	Bridault, Alain
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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06-02-2024

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 23159560 [0030]
- EP 22214415 [0058]