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(54) **Titre : DISTRIBUTEUR RECHARGEABLE DESTINE A ETRE UTILISE AVEC UNE PILE DE MATERIAU EN FEUILLE**
(54) **Title: A REFILLABLE DISPENSER FOR USE WITH A STACK OF SHEET MATERIAL**

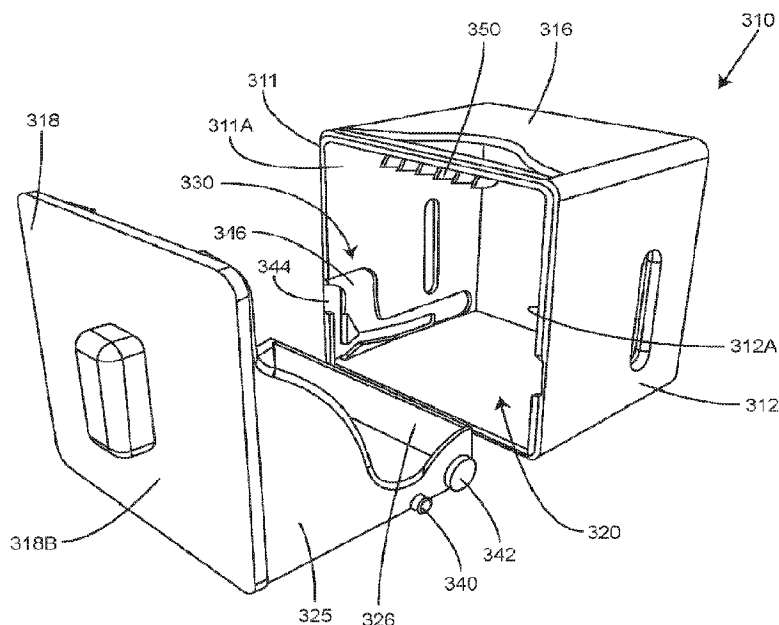


FIG. 5C

(57) **Abrégé/Abstract:**

A refillable dispenser for use with a stack of sheet material. The stack being switchable at least from a compressed state at which said stack is held compressed to a first volume by a compression arrangement, to an expanded state at which said stack has a second volume greater than said first volume. The dispenser comprises a housing defining a first space having a volume corresponding to the first volume for accommodating the stack at the compressed state and a second space including said first space and an expansion space, the second space having a volume corresponding to the second volume for accommodating the stack at the expanded state. The dispenser further comprises a releasing mechanism configured to engage with the compression arrangement to induce switching of the stack from said compressed state to said expanded state at the second space.



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A REFILLABLE DISPENSER FOR USE WITH A STACK OF SHEET MATERIAL

TECHNOLOGICAL FIELD

The present invention relates to the field of refillable sheet material dispensers and particularly, refillable dispensers for dispensing toilet paper, bath tissues, paper towels, or any other type of sanitary paper

BACKGROUND

The use of dispensers and dispensing devices for dispensing sheet materials, especially natural fabric and man-made fabric, is generally known. Examples of such sheet materials, e.g., dry sheets and moist sheets, can be found in bathrooms, toilets, kitchens, medical clinics, in cosmetic applications and the like. The sheet materials to be dispensed are typically provided in non-compressed packs, and conventional dispensers are typically dimensioned correspondingly to the respective stack to be used therein. The packs are typically provided wrapped, and needs to be unwrapped before being provided to the dispenser.

GENERAL DESCRIPTION

According to a first aspect of the presently disclosed subject matter, there is provided a refillable dispenser for use with a stack of sheet material, the stack being switchable at least from a compressed state at which the stack is held compressed to a first volume by a compression arrangement, to an expanded state at which the stack has a second volume greater than the first volume; said dispenser comprising:

- a housing defining a first space having a volume corresponding to the first volume for accommodating the stack at the compressed state and a second space including the first space and an expansion space, the second space having a volume corresponding to the second volume for accommodating the stack at the expanded state, and

- a releasing mechanism configured to engage with the compression arrangement to induce switching of the stack from the compressed state to the expanded state at the second space.

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As per a second aspect of the present disclosure, there is provided a refillable dispenser for use with a stack of sheet material, the stack being switchable at least from a compressed state at which the stack is held compressed to a first volume by a compression arrangement, to an expanded state at which the stack has a second volume greater than the first volume. The dispenser comprises:

- a housing configured to accommodate the stack at least at the expanded state, the housing having a stack inlet configured to facilitate introduction of the stack thereinto; and

- a guiding arrangement configured to guide the stack from the stack inlet into the housing

The dispenser according to the second aspect can further comprise a releasing mechanism configured to engage with the compression arrangement to induce switching of the stack from the compressed state to the expanded state at the second space.

The releasing mechanism can be mounted to said housing such that during the guiding of the stack from the stack inlet into the housing the compression arrangement is brought to engagement with the releasing mechanism to induce switching of the stack from the compressed state to the expanded state.

The examples detailed below can be associated with any one of the aspects presented above, independently, or in combination thereof.

The housing can be defined by side walls, a back wall, a top wall, a base wall and a front wall defining together a housing space therebetween to accommodate the stack in both the compressed state and the expanded state. The housing space can include the first space and the second space. The second space includes the first space and an additional expansion space, which can be adjacent the first space, configured to accommodate the additional volume which is added to the stack when said stack switches from its compressed state to its uncompressed state within the housing. As such, the second space of the housing has a volume that corresponds to the volume of the stack when the stack is in the expanded state.

The term “ wall” as recited throughout the specification and claims denotes to means of restricting and defining a volume, which are not necessarily a continuously spread matrix. The wall can partially extend between two adjacent walls, to an extent enabling it to prevent the stack from falling out therefrom, e.g., a wall containing holes,

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a half carved wall, lines or poles extending diagonally with respect to one another to form an X shape, etc.

The stack can be formed of a single folded sheet material, or of individual sheet materials disposed one above the other, and optionally interfolded one into the other to facilitate consecutive dispensing of the sheets from the stack, where after dispensing a single sheet, the consecutive sheet pops-out from the stack automatically to ease pulling thereof. The stack can be compressed after manufacturing to smaller dimensions, to facilitate cheaper and more environmental shipping thereof. The stack can be held compressed by the compression arrangement, which can be later on removed to enable dispensing of sheet material from the stack. In the compressed state, the stack has a first volume. In the expanded state, the stack has a second volume greater than the first volume. In absent of external disturbances, the stack can switch from the compressed state to the expanded state upon release of the compression arrangement. It is important to note that, at the compressed state of the stack, dispensing of sheet material from the stack is much more difficult than in the expanded state thereof, and can compromise the structure and intended use of the sheets, due to friction forces operating between the sheets or between one fold of the sheet to an adjacent other, and due to internal forces applied by the elastic nature of the sheets structure. Releasing the stack from the compression arrangement before inserting the stack to the dispenser can result in expansion of the stack in the hands of the user, which can induce scattering of the sheet material in the hand, optionally rendering the stack unsuitable for being received in the respective dispenser. Further, such scattering can cause discomfort for a user, an alteration of the folded stacked array so it will compromise smooth and reliable dispense of the sheet material, lack of hygiene as the sheet might fall and come in contact with non-sanitary surfaces such as bathroom floor, and waste of product. Therefore, it can be desirable to release the stack to its uncompressed state within the dispenser, and allow the stack to be expanded there to ease dispensing of sheet material therefrom.

The releasing mechanism, incorporated in the dispenser, is configured to engage with any suitable portion of the compression arrangement to induce releasing thereof, and thereby switching of the stack from its compressed state to the expanded state, within the restraining volume of the housing, within the dispenser, to prevent scattering of the stack outside the housing.

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The compression arrangement may comprise two or more portions configured to be separated at least at one side thereof to facilitate release of the compression arrangement from the stack. The engagement of the releasing mechanism with the compression arrangement can cause tearing or ripping or dismembering of the compression arrangement.

The compression arrangement may comprise a bridging area connected to each of the two or more portions in the compressed state of the stack and holding the two or more portions together prior to the separation thereof.

The bridging area may have a structure corresponding to a structure of the releasing mechanism.

Alternatively, the compression arrangement may be configured to release from the stack as a whole.

The refillable dispenser comprises an outlet configured to facilitate dispensing of the sheet material out from the housing therethrough.

The outlet can be provided at a suitable location for easing a user desiring to utilize the sheet material. The outlet can be disposed adjacent the expansion space of the housing, so that the folded sheets are easily dispensable when the stack is in the expanded state.

Particularly, the outlet can be formed in an upper portion of the dispenser, so that the sheets are being pulled from the top of the stack, thereby reducing friction of one sheet in another, or one fold of the sheet in an adjacent fold, during pulling. When the stack is oriented in an upright orientation, where the expansion space is disposed above the first space, adjacent the outlet, the weight of the stack is applied downwards on the last portion of the sheet to be dispensed, and not on the uppermost portion of the stack, i.e., on the first sheet to be dispensed, which can apply equal force to the weight, compromising its structural integrity.

The refillable dispenser further comprises a stack inlet formed in the housing configured to facilitate introduction of the stack to the housing space.

The stack inlet can be formed in one or more of the walls of the housing, and can have a portion positioned adjacent the bottom wall of the housing, opposite the outlet, to utilize the housing space to maximum and to provide even force distribution while the user inserts the stack into the dispenser. The dimensions of the stack inlet can be sufficient to allow the stack to pass therethrough, at least in its compressed state, for its introduction into the housing.

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Alternatively, one or more walls of the housing can be at least partially detachable so as to create or expose the stack inlet in the housing for introduction of stack into the housing.

The refillable dispenser may further comprise a guiding arrangement configured to guide the stack as the later travels from the inlet into the housing space. The guiding arrangement can comprise at least a track fixed to the housing, extending from an area of the inlet to an area of the first space. With this arrangement, the guiding arrangement can comprise a movable carrier configured to carry the stack along the track into the housing. The movable carrier can be received in the first space along with the stack in its compressed state, and have an open upper portion for allowing the stack to expand thereon into the expansion space. The carrier can be engageable with the track so as to travel therealong and move the stack to the first space in the housing.

For the stack to change states from the compressed state to the expanded state, the releasing mechanism can be mountable with respect to the housing such that it can engage the compression arrangement when the entire stack is received within the first space, or as soon as at least a portion of the stack is received within the first space. In that way, the releasing of the compression arrangement occurs not before the housing walls prevent the stack from being expanded outside the housing. According to a particular example, movement of the stack from the stack inlet to the second space, under guidance of the guiding arrangement, induces engagement of the releasing mechanism with the compression arrangement, which in turn induces switching of the stack from the compressed state to the expanded state at the second space. The releasing arrangement can be disposed, for instance, along the track, or thereabove, in an area with which the compression arrangement engages during traveling of the stack through the inlet. Such relationship between the guiding arrangement and the releasing mechanism can facilitate insertion of the stack into the housing, and releasing of the compression arrangement to induce expansion of the stack within the housing, in a single stroke or in a small number of actions, which can be beneficial for all users to ease the use in the dispenser, yet particularly to users with disabilities that are unable to use both hands.

The track can be a single track or two or more tracks, which can be formed aligned with one another on opposite walls of the housing to assist in stabilizing the carrier. The carrier can be engageable with the tracks by means of locomotive configurations such as wheels, grooves, suspension rails, magnetic rails, and the like.

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The guiding arrangement, and particularly the one or more tracks, can be arranged in a manner dictating a non-linear movement of the carrier, i.e., with the stack, into the housing, and particularly a zig zag movement in which the carrier, in its movement into the housing, is firstly brought towards one of the walls defining the inlet, and after brought away from that wall. Such arrangement can be beneficial when the releasing mechanism is disposed on that wall. The guiding arrangement may be configured to move the stack towards the releasing mechanism and away from the releasing mechanism while guiding the stack into the housing. When that wall is an upper wall of the housing, and the releasing mechanism is incorporated therein, the zig zag movement can facilitate controlled expansion of the stack towards that upper wall upon releasing of the releasing mechanism.

The guiding arrangement may comprise a plurality of protrusions on the carrier and a plurality of corresponding grooves in the inner surfaces of the side walls of the housing. The protrusions can be of different shapes and dimensions, and correspondingly, the grooves can be of different shape and dimensions. The protrusions are configured to be engaged with the grooves and travel therewithin. The non-linear path is created by the geometry and dimensions of the protrusions and the corresponding grooves.

The guiding mechanism may be a characteristic of the stack inlet that facilitates guiding of the stack into the housing. For instance, a shape of the stack inlet may correspond to the shape of the stack in the compressed state. The inlet may comprise a releasing mechanism near an inner periphery thereof, to engage with the compression arrangement when the stack is being introduced inside the housing through the inlet. The releasing mechanism restricts the movement of the compression arrangement, thereby results in change of the state of the stack to the expanded state in the second space inside the housing.

As per another embodiment of the second aspect of the present disclosure, a refillable dispenser comprises a housing, a releasing arrangement, and one or more compressing elements at the stack inlet. The compressing elements provides additional compression pressure to the already compressed stack while introducing the stack to the second space inside the housing, creating a space between the stack and the compression arrangement. The compressing elements may be a wheel, a polished protrusion, and the like.

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The releasing mechanism, while introducing the stack from the stack inlet, can engage the compression arrangement via the created space such that the releasing mechanism forms grips over the compression arrangement and restricts the movement of the compression arrangement while the stack moves to the second space, thereby facilitating release of the compression arrangement from the stack and inducing switching of the stack to its expanded state.

The releasing mechanism may take the form of a sharp wedge or teeth to remove the compression arrangement by tearing or ripping.

The releasing mechanism may take the form of a hook, a grasping arm, or clasps to remove the compression arrangement as a whole.

Additionally, there may be different configuration for the releasing mechanism in the refillable dispenser of the present disclosure. As per one embodiment of a third aspect of the present disclosure, the front wall of the refillable dispenser comprises the releasing mechanism. The front wall can be configured to displace with respect to the housing to cover and uncover the stack inlet for introduction of the stack in the space defined by the housing. The releasing mechanism can be mounted to the front wall, such that during covering of the inlet by the front wall, the releasing mechanism engages the compression arrangement. The front wall can further comprise protrusions at a bottom portion thereof, the protrusions being configured to engage with corresponding grooves formed in the housing to facilitate displacement of the front wall.

The releasing mechanism can be provided at an inner surface of the front wall such that a downwards displacement of the front wall causes engagement of the releasing mechanism to a suitable portion of the compression arrangement of the stack. This action can release the compression arrangement, thereby inducing switching of the state of the stack from the compressed state to the expanded state, when the housing is closed, i.e., when the inlet is covered by the front wall.

The releasing mechanism may further include a pressure protrusion configured to engage with the compression arrangement so as to alter the elasticity thereof, thereby increasing the ease of engagement of the portion of the compression arrangement with the releasing mechanism.

The releasing mechanism may further be configured to engage with the compression arrangement at the bridging area of the compression arrangement.

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As per another embodiment of the third aspect of the present disclosure, a refillable dispenser comprises a housing configured to accommodate a stack in the compressed state and the expanded state. The compression arrangement of the stack can comprise a relieve mechanism that may be partially attached to the uppermost sheet material of the stack.

The stack can be placed in the housing such that the relieve mechanism is accessible by a user and the user can apply a pulling force to the relieve mechanism in order to release the compression arrangement, thereby inducing switching of the stack from the compressed state to the expanded state. The releasing mechanism can be a pulling tab, a perforated ripping slit and/or a compressing sleeve with at least partially glued ends provided at a suitable portion of the stack. In such case, the housing can include a slit or an opening via which a user can reach the releasing mechanism and induce expansion of the stack within the housing.

A refillable dispenser according to the present disclosure can comprise a panel attached to the outer surface of the front wall. The panel may be generally parallel to the outer surface of the front wall and integrally attached to the front wall so as to be displaced along with the front wall. The panel can be attached to the outer surface in such a manner to provide a gap therebetween. The gap is arranged to allow sheet materials dispensed from the stack to pass therethrough and allow a user to access the sheet material by applying a downward force thereon.

A refillable dispenser according to the present disclosure can further comprise a mounting arrangement configured to facilitate mounting of the dispenser to an external element. The mounting arrangement can include mounting brackets, screw arrangement, Velcro mechanism, and hanging supports, i.e., cylindrical hanging supports suitable for hanging on a conventional toilet roll holder. Alternatively, the dispenser can be mountable on a flat surface, such as a tabletop, or to be coupled with a designated bracket.

A refillable dispenser according to the present disclosure can further comprise a peek-hole that allows a user to examine the contents inside the dispenser and evaluate how much sheet material is left therein.

A refillable dispenser according to the present disclosure can further comprise a stopping element rotatable about a hinge to prevent sheet material dropping back into the space of the housing while the sheet material is being dispensed out of the housing. The

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stopping element may be a telescopic arm, an arm having a substantially heavy weight, or an arm made of elastic material.

In a refillable dispenser according to the present disclosure, a platform for introducing the stack is integrated with a guiding arrangement.

A refillable dispenser according to the present disclosure can further include a port in the housing to remove the compression arrangement after the latter has been released from the stack, optionally due to engagement with the releasing mechanism.

A refillable dispenser according to the present disclosure can further include one or more provisions to increase hygienic conditions for a user utilizing the dispenser.

According to another aspect of the present disclosure, there is provided a pack of sheet material for use with a refillable dispenser. The pack comprises:

- at least one stack of sheet material in the form of a Zig-Zag folded strip being switchable at least from a compressed state at which said stack has a first volume to an expanded state at which said stack has a second volume greater than said first volume; and

- a compression arrangement configured to hold said stack at said compressed state, and be released to facilitate expansion of said stack to said expanded state.

According to another aspect of the present disclosure, there is provided a kit comprising a refillable dispenser and at least one stack at its compressed state, the stack being held in the compressed state by a compression arrangement.

The kit can be usable in places where dispensing of sheet material is required for hygienic purposes, such as, in bathrooms, toilets, kitchens, medical clinics, in cosmetic applications, and logistical sites and the like.

The present invention overcomes the drawbacks of the existing dispensing devices by eliminating the need of handling unwrapped sheets outside the dispenser and facilitating the expansion of the stack of sheet material in a designated space inside the dispenser. In addition, by using the compressed stack of sheet material with a dispenser according to the present invention, major environmental benefit such as reduced transportation emission is gained as compressed sheet material articles are used for hygiene and sanitary purposes which require less volume for transportation. Especially in a changing reality in which more sanitary paper is used at home by consumers, and ongoing COVID quarantines which increase the volume of last mile shipping.

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A releasing mechanism enables more reliable and precise engagement for releasing the compression arrangement, which enables less material to be used to manufacture the compression arrangement, as undesired motions done by a user are mitigated by the incorporated mechanisms presently disclosed.

The present inventions enhances the handling of a relatively light and thin material such as a sanitary paper that demands more controlled motions and hand maneuverability from a user, as former inventions demanded from a more challenged parts of the population, such as elderly, people with disabilities and small children.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to better understand the subject matter that is disclosed herein and to exemplify how it may be carried out in practice, embodiments will now be described, by way of non-limiting examples only, with reference to the accompanying drawings, in which:

Fig. 1A is a perspective view of a refillable dispenser for use with a stack of sheet material in accordance with one embodiment of a first aspect of the subject matter of the present application.

Fig. 1B is a side view of the dispenser as that in FIG. 1A, with the stack in a compressed state and the side walls of the dispenser being shown as transparent for the purpose of illustration.

Fig. 1C is a side view of the dispenser as that in FIG. 1A, with the stack in an expanded state and the side walls of the dispenser being shown as transparent for the purpose of illustration.

Fig. 2A is a side view of a stack of sheet material in a compressed state.

Fig. 2B is a perspective view of a stack of sheet material in a compressed state.

Fig. 2C is a side view of the stack of sheet material of Fig. 2A, in an expanded state.

Fig. 2D is a perspective view of a stack of sheet material of Fig. 2B, in an expanded state.

Fig. 2E is a perspective view of a stack of sheet material showing a bridging area.

Fig. 3 is a perspective view of a refillable dispenser for use with a stack of sheet material in accordance with one embodiment of a second aspect of the subject matter of the present application.

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Fig. 4 is a perspective view of a refillable dispenser for use with a stack of sheet material in accordance with another embodiment of a second aspect of the subject matter of the present application.

Figs. 5A-5C illustrate various views of the dispenser of Fig. 4, with the front wall being shown as separated for the purpose of illustration.

Figs. 6A-6F illustrate various stages of introducing a stack of sheet material in the dispenser of Fig. 4.

Fig. 7A illustrate a mechanism to prevent sheet material from dropping into the housing, in accordance with one example of the subject matter of the present application, the mechanism being shown separated from the dispenser for the purpose of illustration.

Figs 7B-7D illustrate various states of the mechanism of Fig. 7A attached to the dispenser.

Fig. 8A illustrates a close-up view of a mounting arrangement for the dispenser, in accordance with one example of the subject matter of the present application.

Fig. 8B illustrates the dispenser mounted to an external member.

Figs 9A-9B illustrate perspective views of a refillable dispenser for use with a stack of sheet material in accordance with another embodiment of a second aspect of the subject matter of the present application.

Fig. 10A illustrates a perspective view of a refillable dispenser for use with a stack of sheet material in accordance with one embodiment of a third aspect of the subject matter of the present application.

Fig. 10B illustrates a perspective view of the dispenser of Fig. 10A, with the front wall displaced with respect to the housing of the dispenser.

Fig. 11A illustrates a perspective view of the dispenser of Fig. 10A, with the front wall being shown as separated for the purpose of illustration.

Fig. 11B illustrates a perspective view of the dispenser of Fig. 10B, with the front wall displaced with respect to the housing of the dispenser by means of a displacing mechanism.

Fig. 11C illustrates a perspective view of the dispenser of Fig. 10A, with a sheet material being dispensed from the dispenser.

Figs. 12A-12B illustrate the dispensers of Figs. 11A-11B, in accordance with another embodiment of the third aspect of the subject matter of the present application.

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Fig. 13A illustrates a perspective view of a refillable dispenser for use with a stack of sheet material in accordance with another embodiment of a third aspect of the subject matter of the present application.

Fig. 13B illustrates a perspective view of the dispenser of Fig. 13A, with the front wall being shown as separated for the purpose of illustration.

DETAILED DESCRIPTION OF EMBODIMENTS

FIGS. 1A-1C illustrate a refillable dispenser 100 for use with a stack of sheet material 10, in accordance with one embodiment of a first aspect of the subject matter of the present application. According to the illustrated embodiment, the dispenser 100 comprises a housing 110 configured to accommodate the stack of sheet material 10 therewithin. The housing 110 includes a back wall 111, a front wall 112, side wall 113, 114, a top wall 115, and base wall 116 assembled together to form the housing 110. In some examples, the walls of the housing 110 can be assembled integrally to form the housing 110, with one or more walls being provided with an inlet opening to allow insertion of stack 10 into the housing 110. In other examples, one or more of the walls of the housing 110 can be at least partially detachable so as to allow insertion of the stack 10 into the housing 110.

The housing 110 defines a space S therewithin to accommodate the stack 10, in a compressed state of the stack 10 as well as in an expanded state of the stack 10. An example of a stack of sheet material for use with the dispenser 100, and the compressed and the expanded states of the stack, is described below with reference to Fig. 2A-2D.

Fig. 2A-2B illustrate the stack 10 in a compressed state thereof while Figs. 2C-2D illustrates the stack 10 in an expanded state thereof, as per one example of the subject matter of the present application. As seen in Figs. 2A-2B, the stack 10 is formed of folded sheet material 15 that are held compressed by a compression arrangement 20. In the compressed state of the stack 10, the stack 10 has a height H1, a width W1, and a length L1, which define a first volume V1 of the stack 10 in the compressed state. The compression arrangement 20 is configured to hold the stack 10 at the compressed state to the first volume V1. The compression arrangement 20 is further configured to be released, optionally upon engagement with a releasing mechanism (not shown). The release of the compression arrangement 20 allows the stack 10 to switch from the compressed state (as in Figs. 2A-2B), to the expanded state (as in Figs. 2C-2D).

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In the expanded state of the stack 10, the stack 10 has a height H2, a width W2, and a length L2, which define a second volume V2 greater than the first volume V1 of the stack 10 in the compressed state. The second volume V2 may be greater than the first volume V1 because one or more of the dimensions of the stack in the expanded state are greater than those in the compressed state. In an example, the height H2 of the stack 10 in the expanded state is greater than the height H1 of the stack 10 in the compressed state, while the length L1, L2 and the width W1, W2 remain constant, so that the stack is expanding between the upper and lower walls of the housing, and optionally is being prevented from further expanding by the fixed distance between the upper and lower walls. As seen in Figs. 2C-2D, the compression arrangement 20 is no longer holding the stack 10 in the compressed state, i.e., the compression arrangement 20 is released from the stack 10. The release of the compression arrangement 20 facilitates expansion of the stack 10 to the expanded state thereof.

The compression arrangement 20 comprises two or more portions 22, 24, that are configured to be separated at least at one side thereof to facilitate release of the compression arrangement 20 from the stack 10. In an example, prior to the separation of the two or more portions 22, 24, i.e., when the stack 10 is held compressed to the first volume V1 by the compression arrangement 20, the two or more portions 22, 24 are connected directly with each other and are separated to facilitate release of the compression arrangement 20 from the stack 10. The compression arrangement 20 can optionally include a ripping area 28 at which the compression arrangement engages with a releasing mechanism to cause separation of the two or more portions 22, 24, thereby facilitating release of the compression arrangement 20 from the stack 10. The ripping area 28 can be provided at any suitable portion of the compression arrangement 20 that allows easy engagement with a releasing mechanism.

In another example, the two or more end portions 22, 24 are connected to a bridging area. Fig. 2E illustrates an example of a bridging area 26 connected to each of the two or more portions 22, 24 in the compressed state of the stack 10, i.e., the bridging area holds the two or more portions 22, 24 together prior to the separation thereof. In the illustrated example, the bridging area 26 has a structure corresponding to a structure of a releasing mechanism. Such an arrangement allows easy engagement with the releasing mechanism to facilitate separation of the two or more portions 22, 24, and thus, to facilitate release of the compression arrangement from the stack 10.

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Whilst the example illustrated in Figs 2A-2D illustrate the compression arrangement being configured to be released from the stack 10 by separation of the two or more portions 22, 24, in an alternative example, the compression arrangement 20 is also configured to be released from the stack 10 without separation of the two or more portions 22, 24. In such an example, the compression arrangement 20 is released from the stack as a whole by a releasing mechanism, for instance, during insertion of the stack 10 into the housing 110 of the dispenser 100. It is appreciated that the stack 10 and the compression arrangement 20 can be of any shape size, characteristics, and/or configuration so as to be inserted into a dispenser and engage with a releasing mechanism of the dispenser.

The folded sheet material 15 of the stack 10 comprise a single sheet folded in a zig-zag fold. In some examples, the folded strip can be constituted by single sheets of material folded one into the other in a pop-out arrangement. The folded sheets of material can be arranged to form the stack 10 in such a manner that one of the multiple sheets being dispensed from the dispenser 100 by a user makes the next sheet of the multiple sheets available to the user for dispensing. In an example, the stack 10 of sheet material can be one stack of a plurality of stacks to be used with the dispenser 100. In another example, the stack 10 of sheet material can form a part of a pack of sheet material for use with the dispenser 100. The pack can further comprise additional stacks of sheet material, each comprising sheet material in the form of a folded strip and each being held to a compressed state by a respective compression arrangement. Each of the stacks of the pack are configured to switch from the compressed state to an expanded state upon release of the respective compression arrangement therefrom, rendering the stack to switch from the compressed state to the expanded state.

Referring again to Figs 1A-1C, the housing 110 defines a first space S1 having a volume that corresponds to the volume of the stack 10 when the stack 10 is in the compressed state, i.e., the volume V1 of the stack 10. The housing 110 is thus configured to accommodate the stack 10 at its compressed state. The housing 110 defines a second space S2 that includes the first space S1 and an expansion space SE. The second space S2 of the housing 110 has a volume that corresponds to the volume of the stack 10 when the stack 10 is in the expanded state, i.e., the volume V2 of the stack 10. The housing 110 is thus configured to accommodate the stack 10 at its expanded state as well, with the expansion space SE allowing the stack 10 to switch from the compressed state to the expanded state thereof.

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The dispenser 100 comprises a releasing mechanism 150 configured to engage with the stack 10, particularly with the compression arrangement 20 of the stack 10. The engagement of the releasing mechanism 150 induces the switching of the stack 10 from its compressed state to the expanded state at the second space S2. As best seen in Fig. 1C, the stack 10 is in the expanded state thereof and the stack 10 is expanded to the expansion space SE.

The engagement of the releasing mechanism 150 with the compression arrangement 20 causes a tearing or ripping of the compression arrangement 20, thereby releasing the compression arrangement 20 from the stack 10. The ripping of the compression arrangement 20 is such that two or more portions of the compression arrangement 20 are separated at least at one side thereof, facilitating the release of the compression arrangement 20 from the stack 10.

When the stack 10 has switched to the expanded state, the folded sheet material forming the stack 10 reaches the top wall of the dispenser and is rendered available to a user for dispensing from the dispenser 100. The dispenser 100 comprises an outlet 120 configured to facilitate dispensing of the sheet material therethrough out from the housing 110 of the dispenser 100. The outlet 120 can be provided at a suitable location for ease of a user desiring to utilize the sheet material. The outlet 120 is disposed adjacent the expansion space SE of the housing 110 so that the folded sheets are easily dispensable when the stack 10 is in the expanded state thereof. The outlet 120 can be disposed, for instance, at a top wall and/or a front wall of the dispenser 100.

The dispenser 100 further comprises a stack inlet 130 configured to facilitate introduction of the stack 10 to space inside the housing 110, for instance, to the first space S1 and/or the second space S2. The stack inlet 130 is formed in the housing 110 of the dispenser 100. In some examples, the stack inlet 130 can be formed in one or more of the walls of the housing, the dimensions of the stack inlet 130 being sufficient to allow the stack 10 to pass therethrough for its introduction into the housing 110. In some examples, one or more walls of the housing 110 can be at least partially detached so as to create or expose the stack inlet 130 in the housing 110 for introduction of stack 10 into the housing 110. The stack 10 can be directly introduced into the first or second space of the housing 110 by a user through the stack inlet 130. Alternatively, a guiding arrangement (not shown) can be provided to the housing 110 so as to facilitate introduction of the stack 10 into the housing 110.

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The dispenser 100 further comprises a mounting arrangement 140 configured to facilitate mounting of the dispenser 100 at a location where dispensing of the folded sheets from the stack 10 is desired. According to non-limiting examples, the mounting arrangement 140 can include mounting brackets, screw arrangement, Velcro mechanism, and hanging supports.

Fig. 3 illustrates a refillable dispenser 200 for use with a stack of sheet material 10, in accordance with one embodiment of a second aspect of the subject matter of the present application. The dispenser 200 includes all other components described above and an additional guiding arrangement 210. The guiding arrangement 210 is configured to guide the stack 10 as the stack 10 travels from the stack inlet 130 of the housing 110 into the second space S2 of the housing 110. The guiding arrangement 210 comprises one or more tracks 212 fixed to the housing 110, such as at the base wall of the housing 110 as seen in Fig. 3, extending at least from an area of the inlet 130 of the housing 110 to an area of the second space S2 of the housing 110. It is appreciated that the tracks 212 can be disposed at an internal side of the side walls in addition to, or alternate to, being disposed on the base wall. The guiding arrangement 210 comprises a carrier 214 engageable with the tracks 212 so as to move along and/or on the tracks 212 in and out of the housing 110. It is appreciated that in the present embodiment, the carrier 214 is engageable with the tracks 212 by means of locomotive configurations such as wheels, grooves, suspension rails, magnetic rails and the like.

The carrier 214 is configured to hold the stack 10 and travel along the rails 212 so as to carry the stack 10 from the outside of the housing 110 into the housing 110. That is, the guiding arrangement 210 is configured to guide the stack as the stack 10 travels at least from the inlet of the housing 100 into the second space S2 of the housing 110. The carrier 214 is provided with a tray 216 to hold the stack 10 being placed thereon while moving over the rails 212.

In the embodiment of Fig. 3, the releasing mechanism 150 is configured to be positioned with respect to the housing 110 such that the stack 10 engages with the releasing mechanism 150 while undergoing movement from the stack inlet 130 to the second space S2, i.e., the movement into the housing 110. The movement of the stack 10 to the second space S2 under guidance of the guiding arrangement 210 induces the engagement of the releasing mechanism 150 with the stack 10, and in particular, with the compression arrangement 20 of the stack 10. The engagement of the releasing mechanism

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150 with the compression arrangement 20 releases the compression arrangement 20 from the stack 10, inducing the switching of the stack 10 from its compressed state to the expanded state. The stack 10 thus switches to the expanded state thereof as the stack 10 is moving from the stack inlet 110 of the housing 110 to the second space S2 of the housing 110.

The releasing mechanism 150 is disposed along the track 212 so that the movement of the stack 10 under guidance of the guiding arrangement 210, i.e., movement of the carrier 214 along the track 212, induces the engagement of the releasing mechanism 150 with the compression arrangement 20 of the stack 10. Such engagement results in ripping or tearing of the compression arrangement 20 thereby inducing switching of the stack 10 to the expanded state thereof. The releasing mechanism can be any sharp cutting means, such as sharp wedge or teeth and the like. It is appreciated that the releasing mechanism 150 can engage with any suitable portion of the compressing arrangement 20. The portion of the compression arrangement 20 that will engage with the releasing mechanism 150 is dependent on the guiding arrangement 210 that guides the stack 10 into the housing 110. Whilst in the present embodiment the releasing mechanism 150 is illustrated as being disposed at an inner surface of the side wall of the housing 110, it is appreciated that the releasing mechanism can be disposed at any other location along the track 212 so as to induce engagement thereof with the compression arrangement 20 of the stack 10.

Fig. 4 illustrates a refillable dispenser 300 for use with a stack of sheet material 10, in accordance with another embodiment of the second aspect of the subject matter of the present application. The stack 10 is switchable from the compressed state to the expanded state thereof. As described with respect to Fig. 2, in the compressed state the stack 10 is held compressed to a first volume by the compression arrangement 20, and in the expanded state, the stack 10 has a second volume greater than the first volume.

The dispenser 300 comprises a housing 310 configured to accommodate the stack 10 in the compressed state and the expanded state of the stack 10. The housing comprises side walls 311, 312, a back wall 313, a top wall 316, and a base wall 317 (not visible in Fig. 4), and a front wall 318. In the embodiment of Fig. 4, at least the front wall 318 is partially detachable from the housing 310 to uncover a stack inlet 320 (best seen in Fig. 5C) of the housing 310, the stack inlet 320 being configured to facilitate introduction of the stack 10 therethrough into the housing 310. The housing 310 comprises a pulling arrangement 323 that allows a user to apply a pulling force so as to facilitate detachment

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of the front wall 318 from the housing 310. The housing 310 further comprises an outlet 322 configured to facilitate dispensing of folded sheet material of the stack 10 out of the housing 310 therefrom. The folded sheet material can be dispensed, for instance, by a user desiring to utilize the sheet material.

The housing 310 comprises a peek-hole 324 that allows a user to examine the contents inside the housing 310. In some examples, the peek-hole 324 allows a user to examine a remaining volume of the stack 10 inside the housing 310 and/or a remaining amount of the folded sheet material constituting the stack 10 inside the housing 310. The housing 310 further comprises a mounting arrangement 314 (visible in Fig. 5A) for mounting of the dispenser 300 at a desired location.

Attention is now directed to Figs. 5A-5C, which illustrate the housing 310 with the front wall 318 separated from the housing 310 to more clearly describe the stack inlet 320 for introduction of the stack 10 therethrough into the housing 310, and a guiding arrangement to carry out such introduction. The housing 310 includes a space S to accommodate the stack 10 in both the compressed state and the expanded state of the stack 10. The dispenser 300 includes a releasing mechanism 350 configured to engage with the stack 10, and particularly with the compression arrangement 20 of the stack 10 during the movement of the stack 10 into the housing 310 from the stack inlet 320. In the present embodiment, the releasing mechanism 350 is disposed at least partially inside the housing 310, at and/or adjacent the top wall 316 of the housing 310.

The engagement of the releasing mechanism 350 with the compression arrangement releases the compression arrangement 20 from the stack 10 and induces switching of the stack 10 from the compressed state to the expanded state. As the compression arrangement 20 engages with the releasing mechanism 350 while the stack 10 is traveling into the housing 310 from the stack inlet 320, the switching of the stack 10 to the expanded state is induced at least partially inside the housing 310 to hold the uncompressed stack from scattering during insertion thereof into the housing. In particular, the compression arrangement can be released once a portion of the stack has been inserted into the space S beyond an imaginary plane defined by the inlet, and particularly, beyond an imaginary plane defined by the edge of the upper wall disposed most proximal to the inlet. Such arrangement facilitates support for the stack in its expansion direction, i.e. upwards toward the upper wall.

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The dispenser 310 includes a guiding arrangement 330 configured to guide the stack 10 from the stack inlet 320 into the housing 110. The guiding arrangement 330 is configured such that during traveling of the stack 10 from the stack inlet 320 into the housing 310, the compression arrangement 20 is brought into engagement with the releasing mechanism 350, thereby inducing the switching of the stack 10 from the compressed state to the expanded state.

The front wall 318 of the housing 310 includes an inner surface 318A facing the stack inlet 320, and an opposite outer surface 318B facing away from the stack inlet 320 of the housing 310. The guiding arrangement 330 includes a carrier 332 coupled to the inner surface 318A of the front wall 318, the carrier 332 being configured to hold the stack 10 thereon and move into the housing 310. The carrier 332 includes a base portion 324 that facilitate the carrier 332 to carry the stack 10 thereon. The carrier further includes surrounding portions 325, 326, and 327, that facilitates the carrier 332, in combination with the inner surface 318A of the front wall 318, to securely carry the stack 10 thereon.

The guiding arrangement further includes a pair of protrusions 340, 342 formed on the carrier 332 and engageable with corresponding grooves 344, 346 formed in the housing 310. The grooves 344, 346 are formed at inner surfaces 311A, 312A of the side walls 311, 312 and engage with the protrusions 340, 342 in a manner that allows the front wall 318 to cover and uncover the stack inlet 320 as desired. In some examples, the protrusions 340, 342 stay engaged with the corresponding grooves 344, 346 while the stack inlet 320 remains at least partially uncovered.

The protrusions 340, 342 and the grooves 344, 346 are configured such that the carrier 332 is guided into the housing 310 in a non-linear path. The movement along the non-linear path is achieved due to the geometry of the grooves 344, 346 and the protrusions 340, 342, whereby when a force is applied to the front wall 318 in order to move the stack 10 placed on the carrier 332 into the housing 310, the stack 10 is guided from the stack inlet 320 into the housing 310 in the non-linear path determined by the grooves 344, 346 and the protrusions 340, 342. During the movement of the stack 10 into the housing 110 from the stack inlet 320 along the non-linear path, the guiding arrangement 330 brings the stack 10 close to the releasing mechanism 350. As the movement continues, the releasing mechanism 350 engages with the compression arrangement 20 to induce switching of the stack 10. Thereafter, as the movement continues further along the linear path, the guiding arrangement 330 brings the stack 10

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away from the releasing mechanism 350. The non-linear path is created by the geometry and dimensions of the protrusions 340, 342 and the corresponding grooves 344, 346. The dimension of the protrusion 340 is pre-determined to as to engage and move within the corresponding groove 344. Similarly, the dimension of the protrusion 342 is pre-determined to as to engage and move with the corresponding groove 346.

As seen in Figs 5A-5C, dimensions of the protrusion 340 is different than that of the protrusion 342 and the measurements and geometry of groove 344 is different from that of the groove 346. The dimensions are determined such that the set of protrusion 340 and groove 344 in engagement cast a different angle from the set of protrusion 342 and groove 346 in engagement, allowing the front wall 318 to be at least partially detached from the housing 310 and uncovering the stack inlet 320. Moreover, as best seen in Fig. 5C, the groove 344 extends to some extent within the groove 346, and hence, the protrusion 340 can additionally move within the groove 346 which corresponds to the protrusion 342. Such a movement can be achieved due to different dimensions of the protrusions 340, 342, for instance, different protruding extent or protruding level of the protrusions 340, 342 from the carrier 332 and/or different diameter of the protrusions 340, 342. Further, it is appreciated that the releasing mechanism 350 can engage with any suitable portion of the compressing arrangement 20 dependent on the guiding arrangement 330 that guides the stack 10 into the housing 310.

The various stages from introducing the stack 10 into the housing 310 to dispensing of the sheet material will now be described with reference to Figs 6A-6F. Initially, as seen in Fig. 6A, the front wall 318 is at least partially detached from the housing 310 such that the stack inlet 320 is uncovered to allow introduction of the stack 10. At this stage, the protrusions 340, 342 and the grooves 344, 346 (not visible) are in engagement with each other to allow the at least partial detachment of the front wall 318. In Fig. 6B, the stack 10 is positioned on the carrier 322 attached to the front wall 318. The stack 10 is held in the compressed state thereof and at the first volume by the compression arrangement 20.

In Fig. 6C, a force F is applied to the front wall 318 in order to move the stack 10 into the housing 310. The stack 10 travels in a non-linear path towards the inside of the housing 310, even if the force F is applied linearly, due to the particular geometry of the guiding arrangement 330 including the protrusions 340, 342 and the grooves 344, 346. As described above with respect to Figs 5A-5C, such a movement along the non-linear path is achieved due to the different dimensions of the protrusions 340, 342, for instance,

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different diameter and/or protruding extent, and the configuration of the corresponding grooves 344, 346. As a result, the stack 10 is guided close to the releasing mechanism 350 so that the compression arrangement 20 engages with the releasing mechanism 350. As seen in Fig. 6D, the movement along the non-linear path lifts the carrier 322 by a distance D towards the top wall 316 and the releasing mechanism 350, thereby achieving the engagement of the compression arrangement 20 with the releasing mechanism 350. As the movement of the stack 10 is continued towards the inside of the housing 310 along the non-linear path, the stack 10 is guided away from the releasing mechanism 350.

In Fig. 6E, the stack 10 has been moved inside the housing 310 and the stack inlet 320 is covered by the front wall 318. Due to the engagement of the compression arrangement 20 with the releasing mechanism 350 during the movement, the compression arrangement is ripped or torn apart and the stack 10 has switched to the expanded state having the second volume greater than the first volume. In the expanded state of the stack, the folded sheet material forming the stack 10 are available for dispensing through the outlet 322. In Fig. 6F, one of the folded sheet material 15 is dispensed out of the housing 310 through the outlet 322, for instance, by a user. The dispensing of one sheet material makes the next sheet material available for dispensing.

The dispenser 300 may include a mechanism to eliminate the possibility of one sheet material dropping back into the space S of the housing 310 while the sheet material is being dispensed out of the housing 310 via the outlet 322. Figs 7A-7D illustrate an example a mechanism 360 provided with the dispenser 300 to prevent sheet material 15 from the stack 10 from being falling back into the housing 310. The mechanism 360 comprises a telescopic arm 362 attached to at least one of the inner surfaces 311A, 312A of the side walls 311, 312. The telescopic arm 362 is attached to the inner surfaces via a round hinge 363 so as to allow rotational movement of the arm 362 about an axis X perpendicular to the hinge 363 and the inner surfaces. The telescopic arm 362 includes an inner rod 364 and an outer sleeve 365 slidable with respect to each other such that the inner rod 364 is configured to slide into and out of the sleeve 365.

The telescopic arm 363 is switchable between a resting state in which the inner rod 364 is contained within the sleeve 365 and a deployed state in which the inner rod 364 is at least partially out of the sleeve 365 and in contact with an uppermost sheet material 15 of the stack 10. The uppermost sheet material may be, for instance, the sheet material of the stack 10 being dispensed out of the housing 310. The inner rod 364 is configured to

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be in contact, at a proximal end 364A thereof, with the uppermost sheet material of the stack 10 disposed within the housing 310.

The rotation of the telescopic arm 363 about the axis X is dependent on the dispensing of the sheet material out of the housing 310, i.e., by a reducing height of the stack 10 as the sheet material thereof is being dispensed through the outlet 322. When the stack 10 is at the maximum height, i.e., when sheet material is not yet dispensed, the telescopic arm 362 is at the resting state. The telescopic arm 362 is positioned at the inner surfaces of the side walls of the housing such that, in the resting state thereof, the telescopic arm 362 rests over at least a part of uppermost sheet material of the stack 10 inside the housing 310 when the stack 10 switches to its expanded state. In one example, the telescopic arm 362 in the resting state is generally parallel to the top and bottom walls of the housing. The telescopic arm 362 acts as a spring allowing a user to apply a pulling force on the uppermost sheet to dispense the uppermost sheet.

As the sheet material is being dispensed out through the outlet 322, the amount of the sheet material remaining inside the housing 310 reduces, thereby reducing the height of the stack 10 of the sheet material, and thus, an uppermost sheet material of the stack 10. The reduction in height creates a space between the telescopic arm 362 and an uppermost sheet material, allowing the telescopic arm 362 to rotate about the axis X due to gravitational force and switch to the deployed state. In the deployed state, an angle is created between the telescopic arm 362 and the top wall 316 of the housing 310. The created angle is greater than 0 degrees. It is understood that a maximum angle between the arm 362 and the top wall 316 is achieved when all the sheets of the stack has been utilized. In the deployed state, the inner rod 364 slides out of the sleeve 365, also under gravitational force, and the proximal end 364A of the rod 363 comes in contact with the uppermost sheet material of the stack 10.

The proximal end 364A in contact with the uppermost sheet material creates a light, reasonable pressure at the point of contact. The uppermost sheet being dispensed out of the outlet 322 is also in contact with the inner surface 318A of the front wall 318 adjacent the outlet 322. The uppermost sheet is dispensed by a user applying a pulling force thereto and the inner surface 318A applies a counter force on the uppermost sheet. Thus, a point of contact of the uppermost sheet with the inner surface 318A provides a resistance to the action of pulling out the sheet because of the amount of pressure of the inner rod 363 applied to the uppermost sheet. The resistance provided during the pulling action prevents

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failure in executing the dispensing action of the sheet by misuse or non-complete action of dispensing the sheet by a user.

In an example, a stopping element having a substantially heavy weight may be used which provides more resistance at the time of pulling of the sheet which results in placement of the sheet between the stopping element and a point of contact of the inner surface 318A, thereby preventing falling of the sheet outside and keeping the sheet inside the housing.

In another example, the rotatable telescopic arm may be replaced by a rotatable arm formed of an elastic material. The elasticity of the material forming the rotatable arm assists in preventing the uppermost sheet material from falling back into the housing by rotating and expanding as the height of the stack is decreasing due to the sheet materials being dispensed out of the housing. The rotatable arm can be made of, for instance, a plastic material.

Figs. 8A-8B illustrate an exemplary embodiment of the mounting arrangement 314 configured to mount the dispenser 300 to an external member 500. The external member 500 includes a hanging rod 510 and the external member 500 is provided at a specific location in a room where utilization of the folded sheet material would be required. The mounting arrangement 314 comprises a first member 315 disposed at the back wall 313 and configured to be coupled to a second member 316. The second member 316 comprises a hole 317 that allows coupling with the first member 315 in a specific orientation of the first member 315. The second member 316 can be rotated to be arranged at the specific orientation to allow coupling with the first member 315. The second member 316 further comprises a hollow cavity 318 and an opening 319 for coupling with the external member 500, thereby mounting the dispenser 300 to the external member 500. Whilst in the present embodiment the mounting arrangement 314 is illustrated as having first and second members, it is appreciated that the first and second members can be unitarily formed so as to be a single member. Moreover, the external member 500 can include any other configuration for coupling with the mounting arrangement 314 of the dispenser 300 such that mounted position of the dispenser 300 increases the ease of dispensing the sheet material for a user and makes the user experience more pleasant. For instance, the dispenser 300 can include an external hanging arrangement (not shown) coupled to the dispenser 300 for positioning the dispenser 300 in a manner that makes it easier for a user to dispense sheets from the dispenser. The external hanging arrangement

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can be coupled to the dispenser 300 by any suitable means such as magnetic connection, mechanical arrangement, latches, velcro, and/or glue.

Figs. 9A-9B illustrates a refillable dispenser 400 for use with a stack of sheet material 10, in accordance with another embodiment of the second aspect of the subject matter of the present application. The dispenser 400 comprises a housing 410 configured to accommodate the stack of sheet material 10 in a space S therewithin. The housing 410 includes an outlet 420 configured to allow dispensing of sheet material therethrough and at least one stack inlet 422 formed in a side wall of the housing 410. The stack inlet 422 is configured to allow a stack 10 in the compressed state thereof to be inserted into the housing 410.

The dispenser comprises a releasing mechanism 430 configured to engage with the compression arrangement 20 of the stack 10 as the stack 10 is being inserted into the housing 410. It is appreciated that the insertion of the stack 10 can be carried out manually by a user and/or a guiding arrangement can facilitate the insertion of the stack 10 into the housing 410. The releasing mechanism 430 is configured to engaged with the compression arrangement 20 such that the releasing mechanism 430 forms a grip over the compression arrangement 20 and restricts movement of the compression arrangement 20 farther while the stack 10 is being inserted into the housing 410. That is, upon engagement of the releasing mechanism 430 with the compression arrangement 20, the releasing mechanism 430 holds the compression arrangement 20 and prevents movement of the compression arrangement 20 into the housing 410 along with the stack 10, thereby facilitating release of the compression arrangement 20 from the stack 10 as a whole and inducing switching of the stack 10 to its expanded state.

The releasing mechanism 430 may take the form of a hook, a grasping arm, or clasps without departing from the scope of the invention. Whilst in the illustrated embodiment the releasing mechanism 430 is shown as being provided at an inner surface of the side wall, it is appreciated that an inner surface of the top and/or bottom wall of the housing along the direction of travel of the stack 10 into the housing can also be provided with a releasing mechanism in addition to or in place of the releasing mechanism 430. The dispenser 400 comprises a removing port 450 provided at a bottom wall 413 of the housing 410 that allows a user to remove the compression arrangement 20, that has been released from the stack 10, out from the space S of the housing 410.

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The dispenser 400 further comprises a top compressing element 440 and a bottom compressing element 442 at the stack inlet 422. The compressing elements 440, 442 are configured to apply a pressure on the stack 10 while the stack 10 is being inserted into the housing 410, so as to further compress the stack 10 that is already in the compressed state thereof due to the compression arrangement 20. In one example, the compressing elements 440, 442 are configured to apply a pressure at a portion of the stack 10 that is to be inserted lastly into the housing 410, i.e., a portion of the stack 10 other than the portion which has already entered the housing 410. As the stack 10 in its compressed state is being inserted from the stack inlet 422 into the housing 410, the compressing elements 440, 442 apply a compression pressure on the stack 10, causing the stack 10 to be compressed further. As a result, a space is created between the sheet material of the stack 10 and the compression arrangement 20 holding the sheet material of the stack 10. The releasing mechanism 430 engages with the compression arrangement 20 via the created space and forms a firm grip therewith, thereby restricting any further movement of the compression arrangement 20 into the housing 410. The compression arrangement 20 is thus held in place and released from the stack 10 that travels further into the housing 410. The release of the compression arrangement 20 from the stack 10 induces the switching of the stack 10 from the compression state to the expanded state while being inserted into the housing 410.

In some example, prior to initiating insertion of the stack 10 into the housing 410, the stack 10 is oriented such that an imaginary plane passing through each portion the compression arrangement 20 is generally parallel to the stack inlet 422, enabling easy engagement of the releasing mechanism 430 with the compression arrangement 20. In some examples, the compressing elements 440, 442 may be a wheel or a polished protrusion and the like. Whilst the illustrated embodiment shows a top compressing element 440 and a bottom compressing element 442, it is appreciated that a single compressing element can be provide at the inlet without departing from the scope of the invention.

According to another embodiment, the guiding mechanisms described above can include a platform attached to the housing of the dispenser via a hinge (not shown), allowing a hinge-based insertion guiding of a stack of sheet material placed thereon into the housing of the dispenser. Such a platform can be utilized, for instance, in cases where the stack inlet is provided at the base of the housing. The hinge-based insertion with the

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platform will allow introduction of the stack into the housing through the stack inlet at the base of the housing.

According to another embodiment, the dispenser can include a platform for introducing a stack of sheet material placed thereon into the housing, the platform being integrated with a releasing mechanism. The platform can comprise a face of the housing and attached to the housing via a hinge. After the stack has been introduced into the housing under guidance of the platform, the releasing mechanism integrated with the platform is brought into engagement with the stack, thereby inducing switching of the stack to the expanded state thereof.

According to another embodiment, the guiding mechanism can be a characteristic of the stack inlet that assists a user in guiding a compressed stack into the housing of the dispenser. A shape of the stack inlet may correspond to the shape of the stack in the compressed state to allow insertion of the stack into the housing through the stack inlet. The stack inlet may be provided with the releasing mechanism, for instance at an inner periphery thereof, to restrict the movement of the compression arrangement of the stack. When the stack is being introduced inside the housing through the stack inlet, the compression arrangement engages with the releasing mechanism that restricts the movement of the compression arrangement further into the housing, thereby releasing the compression arrangement from the stack and inducing the change of state of the stack from the compressed state to the expanded state in the housing.

According to another embodiment, a wall of the dispenser can be integrated with a releasing mechanism, the wall being at least partially displaceable to allow introduction of a stack into the dispenser. The dispenser can additionally be configured to dispense sheet material from a top portion thereof while allowing a user to access the sheet material by applying a downward force thereon. Figs. 10A-10B illustrate perspective views of a refillable dispenser 600 for use with a stack of sheet material 10, in accordance with one embodiment of a third aspect of the subject matter of the present application.

The dispenser 600 includes a housing 610 configured to accommodate the stack 10 in a compressed state and an expanded state of the stack 10. The housing 610 is defined by side walls 611, 612, a back wall 613, a front wall 614, a top wall 615 and a base wall 616 (not visible in Figs. 10A-10B, visible in Fig. 11A). As seen in Fig. 10B, the front wall 614 is configured to be displaced with respect to the housing 610 to uncover a stack inlet 620 of the housing 610, the stack inlet 620 being configured to facilitate introduction

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of the stack 10 therethrough into the housing 610. The stack 10 can be introduced into the housing 610 manually by a user or by a guiding mechanism.

The front wall 614 of the housing 610 includes an inner surface 614A facing the stack inlet 620, and an opposite outer surface 614B facing away from the stack inlet 620 of the housing 610. The dispenser 600 comprises a panel 622 attached to the outer surface 614B of the front wall 614. The panel 622 may be generally parallel to the outer surface 614B of the front wall 614 and the panel 622 may be integrally attached to the front wall 614 so as to be displaced along with the front wall 614. The panel 622 is attached to the outer surface 614B in such a manner to provide a gap 625 therebetween. The gap 625 is arranged to allow sheet materials dispensed from the stack 10 to pass therethrough.

The dispenser 600 comprises an outlet 630 formed at a top portion of the housing 610, the outlet 630 being configured to facilitate sheet material to be dispensed out of the housing 610. The outlet 630 can be formed, for instance, in the top wall 615 of the housing 610. A portion of the front wall 614 adjacent the outlet 630 can be shaped so as to form a smooth surface, assisting the sheet material being dispensed through the outlet 630 to pass into the gap 625. The gap 625 acts as a guiding space to make the dispensed sheet available to a user from a bottom end of the gap 625, as best seen in Fig. 11C.

Attention is now directed to Figs. 11A-11C to more clearly illustrate use of the dispenser 600 with a stack 10. In Fig. 11A, the front wall 614 is shown as separated from the housing 610 to more clearly describe the stack 10, the displacing arrangement 650, and the releasing mechanism 660. The stack 10 is held compressed to compressed state by the compression arrangement 20 and the stack 10 switchable to an expanded state upon release of the compression arrangement 20 from the stack 10.

The releasing mechanism 660 is provided at the inner surface 614A of the front wall 614. The releasing mechanism 660 is configured to engage with the compression arrangement 20 so as to release the compression arrangement 20 from the stack 10. The releasing mechanism 660 can engage with any suitable portion of the compressing arrangement 20 based on the manner in which the stack 10 is inserted into the housing 610. The engagement of the releasing mechanism 660 with the compression arrangement 20 induces switching of the stack 10 from the compressed state to the expanded state thereof. The front wall 614 is displaceable with respect to the housing 610, by means of the displacing arrangement 650. In the illustrated embodiment, the front wall 614 is

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slidable with respect to the housing 610. The displacement of the front wall 614 facilitates the engagement of the releasing mechanism 660 with the compression arrangement 20.

The displacement of the front wall 614 further facilitates covering and uncovering of the stack inlet 620. The displacing arrangement 650 comprises protrusions 652, 654 formed on the inner surface 614A of the front wall 614. The protrusions 652, 654 can be formed, for instance, at a bottom portion of the inner surface 614A. The protrusions 652, 654 are engageable with corresponding grooves 656, 658 formed in the housing 610. The grooves 656, 658 are formed at inner surfaces 611A, 612A of the side walls 611, 612 and engage with the protrusions 652, 654 in a manner that allows the front wall 614 to move with respect to the housing 610, thereby covering and uncovering the stack inlet 620 as desired. As shown in Fig. 11B, the stack 10 is disposed inside the housing 610 and the protrusions 652, 654 are in engagement with the corresponding grooves 656, 658, thereby allowing the front wall 614 to be displaced, for instance by a user, with respect to the housing 610.

The protrusions 652, 654 and the grooves 656, 658 are configured such that a downward displacement of the front wall 614 by the displacing arrangement 650 brings the releasing mechanism 660 close to the compression arrangement 20 of the stack 10, so as to allow easy engagement of the releasing mechanism 660 with the compression arrangement 20. As the downward displacement of the front wall continues, the releasing mechanism 660 induces switching of the stack 10 from the compressed state to the expanded state. The releasing mechanism 660 can include a pressure protrusion 670 configured to engage with the compression arrangement 20 so as to alter the elasticity of the compression arrangement 20. The pressure protrusion 670 may be formed of a smooth surface such that upon a downward displacement of the front wall 614, the pressure protrusion 670 applies a pressure on the compression arrangement 20. The engagement of the pressure protrusion 670 with the compression arrangement 20 alters the elasticity of the compression arrangement 20 such that a portion of the compression arrangement 20 corresponding to pressure protrusion 670 is lifted, thereby increasing the ease of engagement of a portion of the compression arrangement 20 with the releasing mechanism 660. Whilst the releasing mechanism 660 in Fig. 11A is shown in the form of a sharp wedge, it is appreciated that the releasing mechanism 660 can be of any customized shape so as to engage with the compression arrangement 20.

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In some examples, the protrusions 652, 654 and the grooves 656, 658 stay engaged while the stack inlet 620 is uncovered and the stack 10 is introduced into the housing 610. The protrusions 652, 654 can be in engagement with respective top ends of the grooves 656, 658 while the stack 10 is introduced into the housing 610. In other examples, the protrusions 652, 654 can be disengaged from the grooves 656, 658 to completely detach the front wall 614 from the housing 610 and uncover the stack inlet 620.

As shown in Fig. 11C, the front wall 614 is displaced so as to cover the stack inlet 620 after insertion of the stack 10 into the housing 610. The stack 10 is in the expanded state thereof due to engagement of the releasing mechanism 660 with the compression arrangement 20 while the front wall 614 is being displaced to cover the stack inlet 620. In the expanded state of the stack 10, a sheet material 15 from the stack 10 is available for dispensing. The sheet material 15 is dispensed out of the housing 610 through the outlet 630. The sheet material 15 is guided through the gap 625 and is available to a user from a bottom end of the gap 625. The user thus dispenses the sheet material 15 by applying a downward pulling force on the sheet 15 that comes out of the housing 610 through the outlet 630.

In an embodiment, the compression arrangement may be provided with a bridging area at which the compression arrangement engages with a releasing mechanism. Figs. 12A-12B illustrate perspective views of the refillable dispenser 600 of Fig. 11A-11B, with the stack 10 comprising the compression arrangement 20 with a bridging area 26.

The releasing mechanism 660 is configured to engage with the compression arrangement 20 at the bridging area 26 so as to release the compression arrangement 20 from the stack 10. The engagement of the releasing mechanism 660 with the bridging area 26 induces switching of the stack 10 from the compressed state to the expanded state thereof. The front wall 614 is slidable with respect to the housing 610 and the displacement of the front wall 614 facilitates the engagement of the releasing mechanism 660 with the bridging area 26 of the compression arrangement 20.

The displacing arrangement 650 is configured such that a downward displacement of the front wall 614 by the displacing arrangement 650 brings the releasing mechanism 660 close to the bridging area 26, so as to allow easy engagement of the releasing mechanism 660 with the bridging area 26. As the downward displacement of the front wall 614 continues, the releasing mechanism 660 induces switching of the stack 10 from the compressed state to the expanded state. The pressure protrusion 670 of the releasing

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mechanism 660 is configured to engage with the compression arrangement 20 so as to alter the elasticity of the compression arrangement 20. The pressure protrusion 670 causes a portion of the compression arrangement 20 corresponding to the pressure protrusion 670 is lifted so that the ease of engagement of the bridging area 26 with the releasing mechanism 660 is increased.

According to an embodiment, the dispenser may further include additional space to store extra stacks of sheet materials for refilling the dispenser. Multiple compressed stacks can thus be inserted into the dispenser as replacement stacks while one operational stack is being utilized to provide sheet material for dispensing. The additional space may be configured in such a way that a replacement stack of sheet material can be provided in the space of the housing after a major amount of sheet material from the operational stack has been dispensed or when the space inside the housing is empty after an operational stack has been fully dispensed. The introduction of the replacement stack into the housing may be manual or automatic. For automatic replacement, the refillable dispenser may comprise a replacement mechanism to trigger the replacement automatically. The replacement mechanism may be triggered by considering any one of free space inside the housing, weight of a current stack of sheet material, time of a day and the like.

According to another embodiment, the stack may include a mechanism to release the compression arrangement from the stack. The mechanism can be arranged to be activated by a user with assistance from the dispenser. The user can interact with the mechanism to initiate the releasing of the compression arrangement from the stack. The user can interact with the mechanism when the stack is already disposed inside the dispenser or when the stack is being introduced into the dispenser. Figs. 13A-13B show an exemplary embodiment of such a mechanism.

Fig. 13A illustrates a refillable dispenser 700 having a housing 710 configured to accommodate the stack 10 in the compressed state and the expanded state therewithin. The housing 710 comprises a space S therewithin defined by side walls 711, 712, a back wall 713, a front wall 714, a top wall 715 and a base wall 716. The refillable dispenser 700 further comprises a stack inlet 720 to introduce the stack 10 into the housing 710 and an outlet 730 to dispense a sheet material from the housing 710. The front wall 714 is configured to be displaced with respect to the housing 710, by means of a displacing arrangement 750, to uncover the stack inlet 720 of the housing 710. In one example, the dispenser 700 can be similar to the dispenser 600 shown in Fig. 10A and the displacing

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mechanism 750 can be similar to the displacing mechanism 650 shown in Fig. 11A. As seen in Figs 13A-13B, the stack 10 is placed inside the housing 710. The stack 10 can be placed inside the housing 710 using a guiding arrangement or manually by a user.

In the illustrated embodiment, the stack 10 is held in the compressed state with help of the compression arrangement 20 comprising a releasing mechanism 30. The releasing mechanism 30 may take the form of a pulling tab. The releasing mechanism 30 may be at least partially attached to an uppermost sheet material of the stack 10, directly or indirectly, such that a pulling force applied to the releasing mechanism 30 facilitates switching of the stack 10 to the expanded state thereof, thereby allowing a user to dispense the sheet material from the dispenser 700. The stack 10 is disposed inside the housing 710 such that the releasing mechanism 30 is accessible by a user through the outlet 730 and the user can apply a pulling force to the releasing mechanism 30 so as to release the compression arrangement 20 from the stack 10. In one example, as a user pulls the releasing mechanism 30 through the outlet 730, the stack 10 is switched to the expanded state and the sheet material of the stack, for instance, the uppermost sheet material, is simultaneously pulled through the outlet, thus initiating the dispensing of the sheet material from the dispenser 700.

When a pulling force is applied to the releasing mechanism 30, the movement of the stack 10 in the direction of the pulling force is restrained within the space S by the housing 710, for instance, by the side walls 711, 712, the front wall 714 and the top wall 715. The restrained movement of the stack 10 within the space S allows easy release of the releasing mechanism 30, thereby activating the release of the compression arrangement 20 from the stack 10 and resulting in change of the state of the stack 10 from the compressed state to the expanded state.

Whilst in the present embodiment the releasing mechanism 30 is illustrated as a pulling tab, other non-limiting examples of such a releasing mechanism includes a perforated ripping slit and/or a compressing sleeve with at least partially glued ends provided at a suitable portion of the stack 10.

According to another embodiment, the refillable dispenser described in the present disclosure may additionally include one or more provisions to increase hygienic conditions for a user utilizing the dispenser.

The dispenser described in the present disclosure along with at least one stack may form part of a kit usable in places where dispensing of sheet material is required for

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hygienic purposes, such as, in a bathroom, kitchen, medical clinics, logistical site and the like. The stack forming the kit may be in the compressed state thereof. The at least one stack may switch to its expanded state after engagement with a releasing mechanism of the dispenser.

According to an exemplary embodiment, the refillable dispenser of the present disclosure can comprise a port in the housing to remove the compression arrangement that has been released from the stack after engagement with the releasing mechanism. One example of a port to remove a released compression arrangement is the removing port 450 provided to the dispenser 400, as illustrated in Fig. 9A above. The removing port 450 is provided at a bottom wall of the dispenser 400 and allows a user to remove the compression arrangement, that has been released from the stack 10, out from the dispenser 400. Whilst the removing port 450 is shown with respect to dispenser 400, it is appreciated that a similar port can be provided in the other dispensers of the present disclosure without departing from the scope of the invention. Moreover, though the removing port is shown as being provided at a bottom wall of the dispenser, the removing port can also be provided at other walls of the dispenser, in addition to or instead of the port at a bottom wall. In some alternate examples, the removing port may be same as the outlet being utilized for dispensing of the sheet material, allowing a user to dispense sheet from the outlet as well as remove the released compression arrangement from the outlet. The removing port thus allows a user to gain access inside of the housing in order to engage the released compression arrangement. In taking out the released compression arrangement from the housing, the stack provides a counter force against the force applied by a user on the compression arrangement since the stack is enclosed by the faces of the housing. As a result, only the released compression arrangement is taken out from the housing and the sheet material forming the stack remain intact inside the housing.

It should be noted that the uses for the refillable dispenser of the present disclosure is not specific to particular area and the dispenser can be used in bathrooms, kitchens of a residence and different settings such as medical clinic, logistical site and the like, where it is important to maintain hygiene.

It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity,

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described in the context of a single embodiment, may also be provided separately or in any suitable sub-combination.

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CLAIMS

1. A refillable dispenser for use with a stack of sheet material, said stack being switchable at least from a compressed state at which said stack is held compressed to a first volume by a compression arrangement, to an expanded state at which said stack has a second volume greater than said first volume; said dispenser comprising:

a housing defining a first space having a volume corresponding to said first volume for accommodating said stack at said compressed state and a second space including said first space and an expansion space, said second space having a volume corresponding to said second volume for accommodating said stack at said expanded state; and

a releasing mechanism configured to engage with said compression arrangement to induce switching of said stack from said compressed state to said expanded state at said second space.

2. The dispenser according to Claim 1, further comprising an outlet disposed adjacent said expansion space configured to facilitate dispensing of the sheet material out from the housing therethrough.

3. The dispenser according to Claim 1 or Claim 2, further comprising a stack inlet formed in said housing configured to facilitate introduction of said stack to said second space.

4. The dispenser according to Claim 3, wherein said housing further comprises a guiding arrangement configured to guide said stack as the latter travels from said inlet into said first space.

5. The dispenser according to Claim 4 when depending on Claim 3, wherein said guiding arrangement comprises a track fixed to said housing, extending from an area of said inlet to an area of said first space.

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6. The dispenser according to Claim 4 or Claim 5, wherein said guiding arrangement further comprises a movable carrier configured to carry said stack along the track into the housing;

7. The dispenser according to Claim 6 when depending on Claim 5, wherein said movable carrier is engageable with said track so as to travel therealong.

8. The dispenser according to any one of claims 4 to 7, wherein said releasing mechanism is configured to be positioned with respect to the housing such that movement of the stack from said stack inlet to said second space, under guidance of the guiding arrangement, induces engagement of said releasing mechanism with said compression arrangement, which in turn induces switching of said stack from said compressed state to said expanded state at said second space.

9. The dispenser according to Claim 8 when depending on any one of claims 5 to 7, wherein said releasing mechanism is disposed along said track.

10. A kit comprising the dispenser according to any one of the preceding claims, and said stack at its compressed state.

11. The kit according to Claim 10, wherein said compression arrangement comprises two or more portions configured to be separated, at least at one side thereof, to facilitate releasing of said compression arrangement from said stack.

12. The kit according to Claim 11, wherein said compression arrangement further comprises a bridging area connected to each of said two or more portions so as to hold them together prior to said separation thereof.

13. The kit according to Claim 12, wherein said bridging area has a structure corresponding to a structure of said releasing mechanism.

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14. A pack of sheet material for use with a dispenser according to Claim 2, said pack comprising:

at least one stack of sheet material switchable at least from a compressed state at which said stack has a first volume to an expanded state at which said stack has a second volume greater than said first volume; and

a compression arrangement configured to hold said stack at said compressed state, and be released to facilitate expansion of said stack to said expanded state, wherein at said expanded state, said stack reaches said outlet.

15. A refillable dispenser for use with a stack of sheet material, said stack being switchable at least from a compressed state at which said stack is held compressed to a first volume by a compression arrangement, to an expanded state at which said stack has a second volume greater than said first volume; said dispenser comprising:

a housing configured to accommodate said stack at least at said expanded state, said housing having a stack inlet configured to facilitate introduction of said stack thereinto; and

a guiding arrangement configured to guide said stack from said stack inlet into said housing.

16. The dispenser according to Claim 15, further comprising a releasing mechanism configured to engage with said compression arrangement to induce switching of said stack from said compressed state to said expanded state at said housing, said releasing mechanism being mounted to said housing such that during said guiding of said stack from said stack inlet into said housing, said compression arrangement is brought to engagement with said releasing mechanism to induce switching of said stack from said compressed state to said expanded state.

17. The dispenser according to Claim 15 or Claim 16, wherein said guiding arrangement is configured to guide said stack from said stack inlet into said housing in a non-linear path.

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18. The dispenser according to Claim 17, wherein said non-linear path is defined such that during said guiding, at a first stage a first wall of said stack is brought towards said releasing mechanism, and in a second stage, an opposite wall of said stack is brought away from said releasing mechanism.

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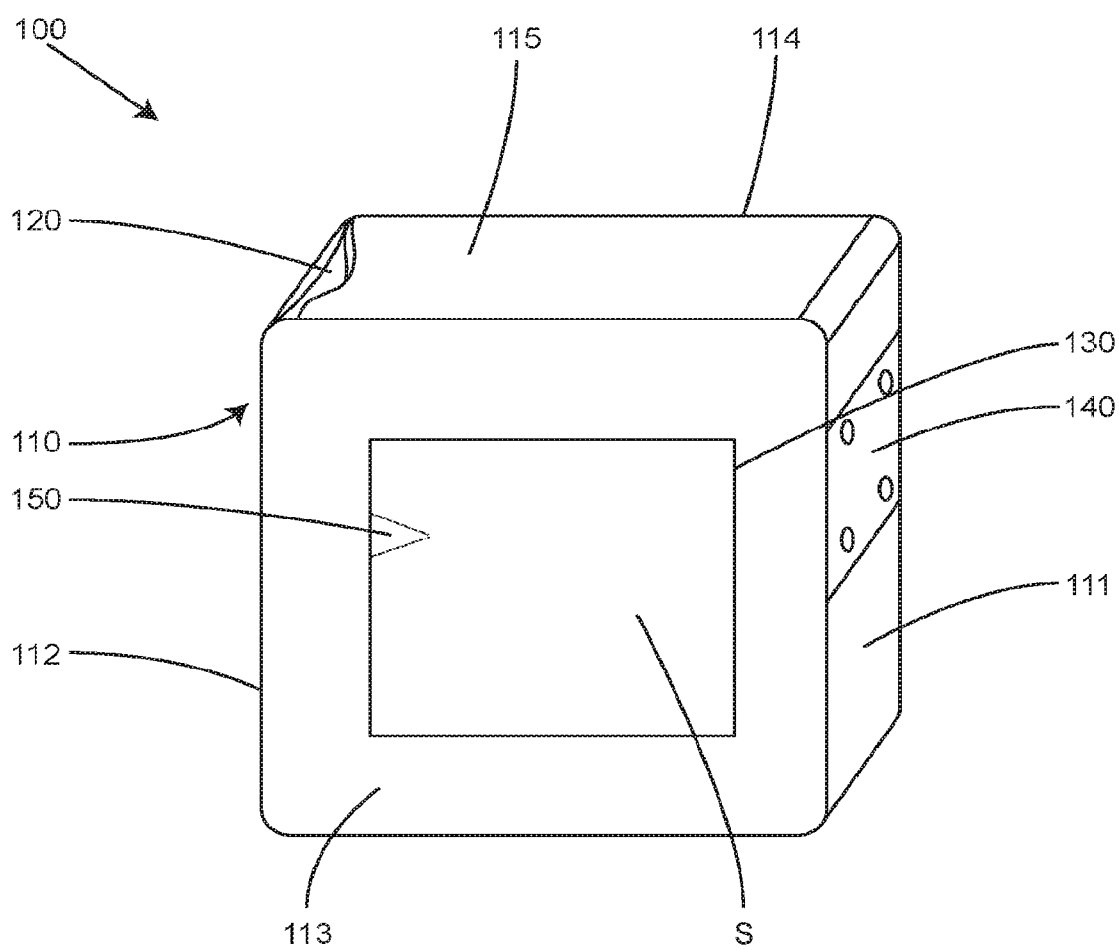


FIG. 1A

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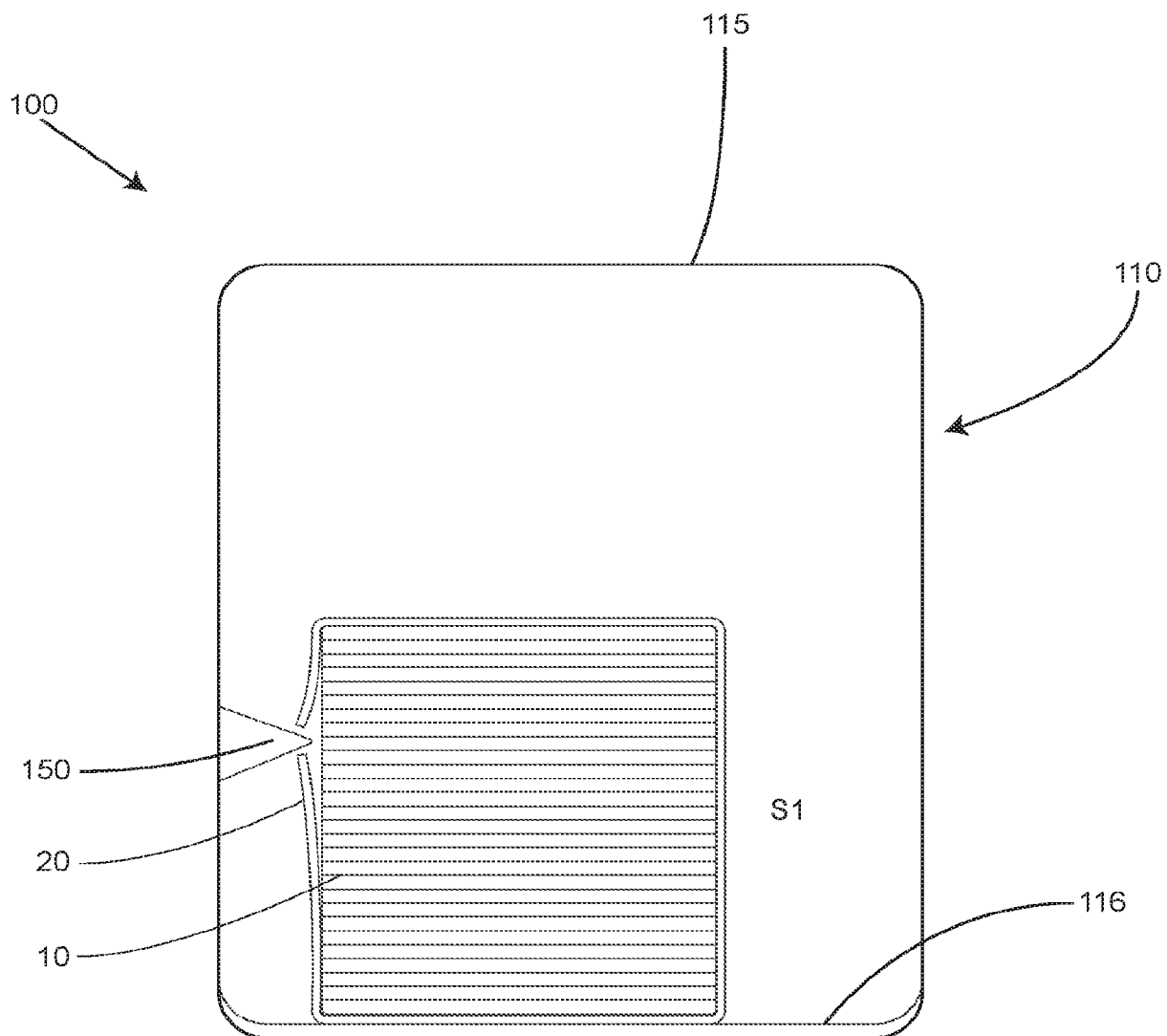


FIG. 1B

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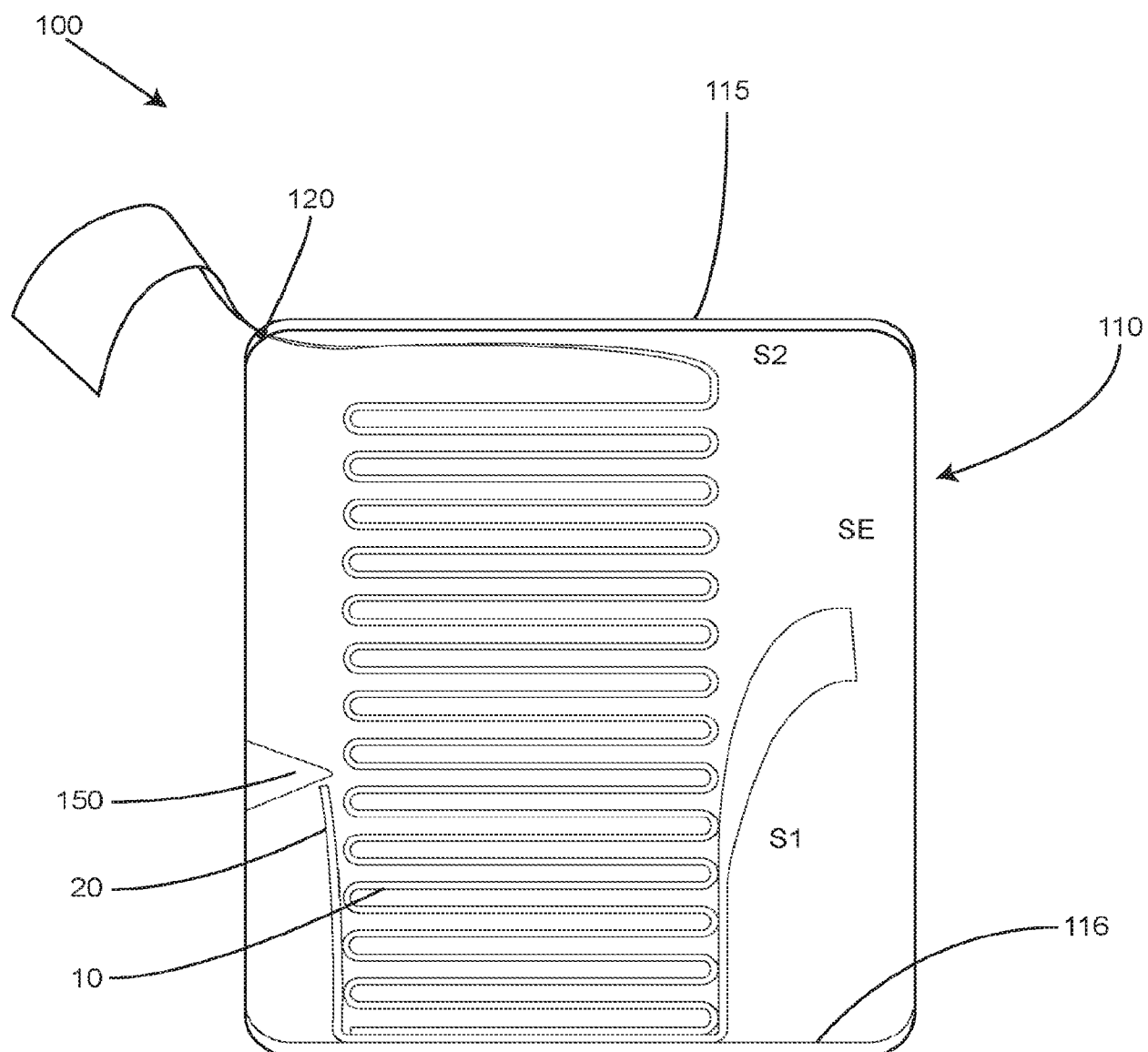


FIG. 1C

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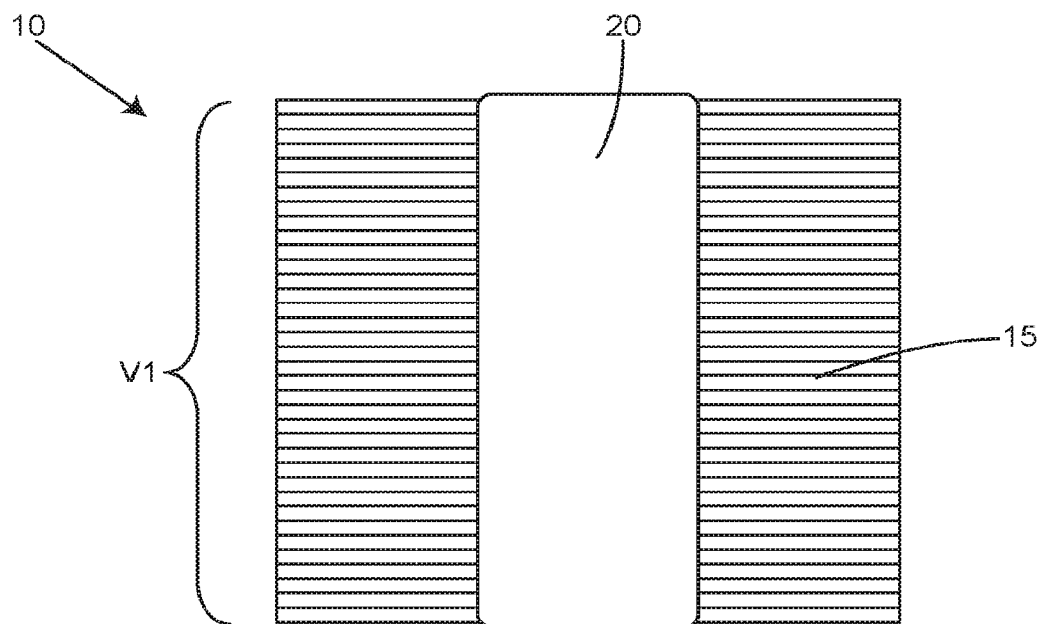


FIG. 2A

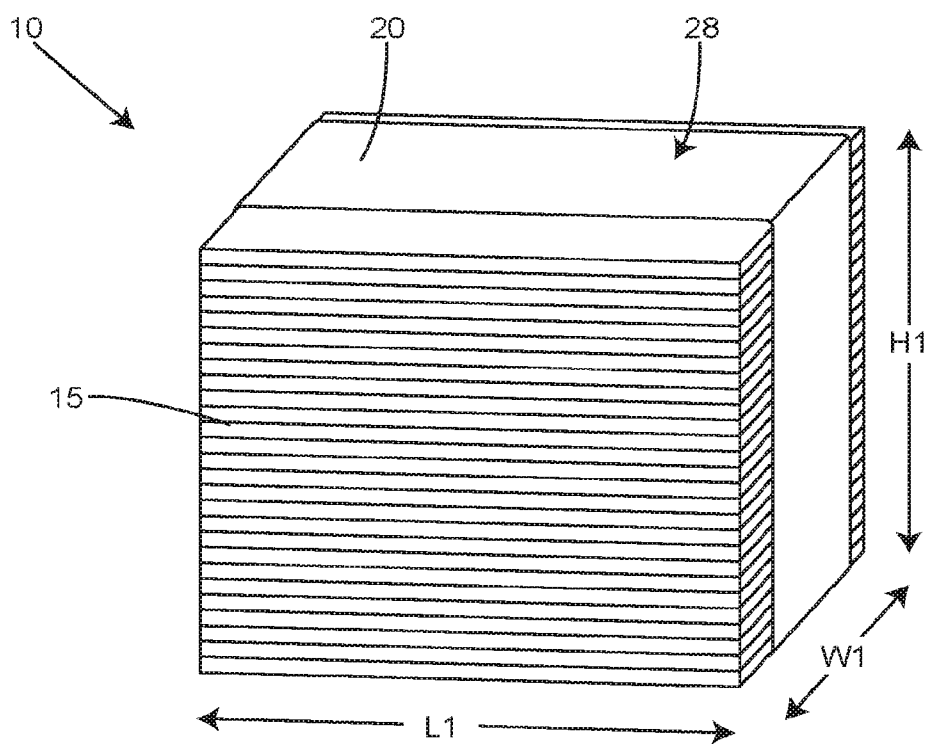


FIG. 2B

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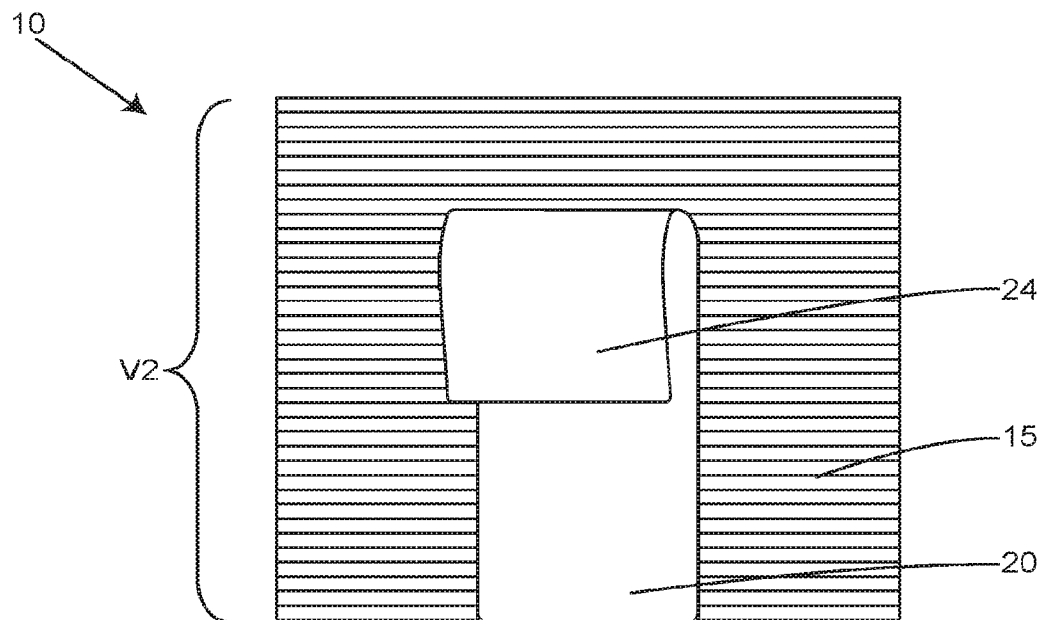


FIG. 2C

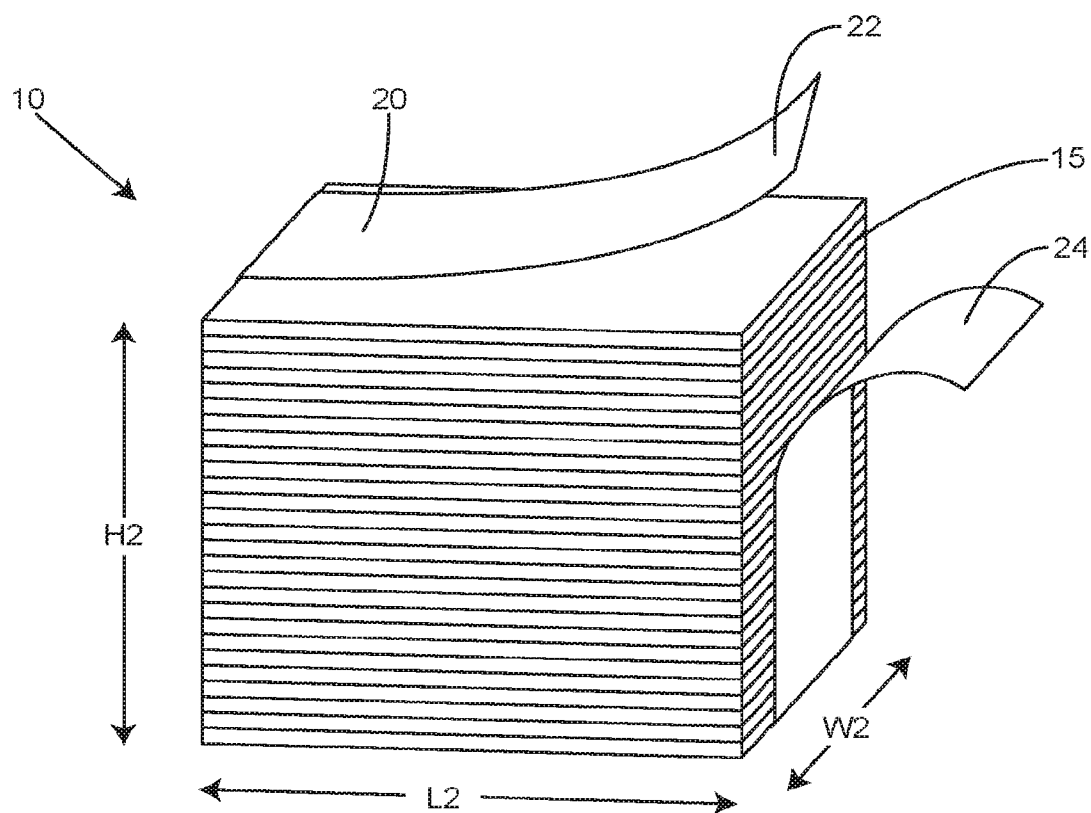


FIG. 2D

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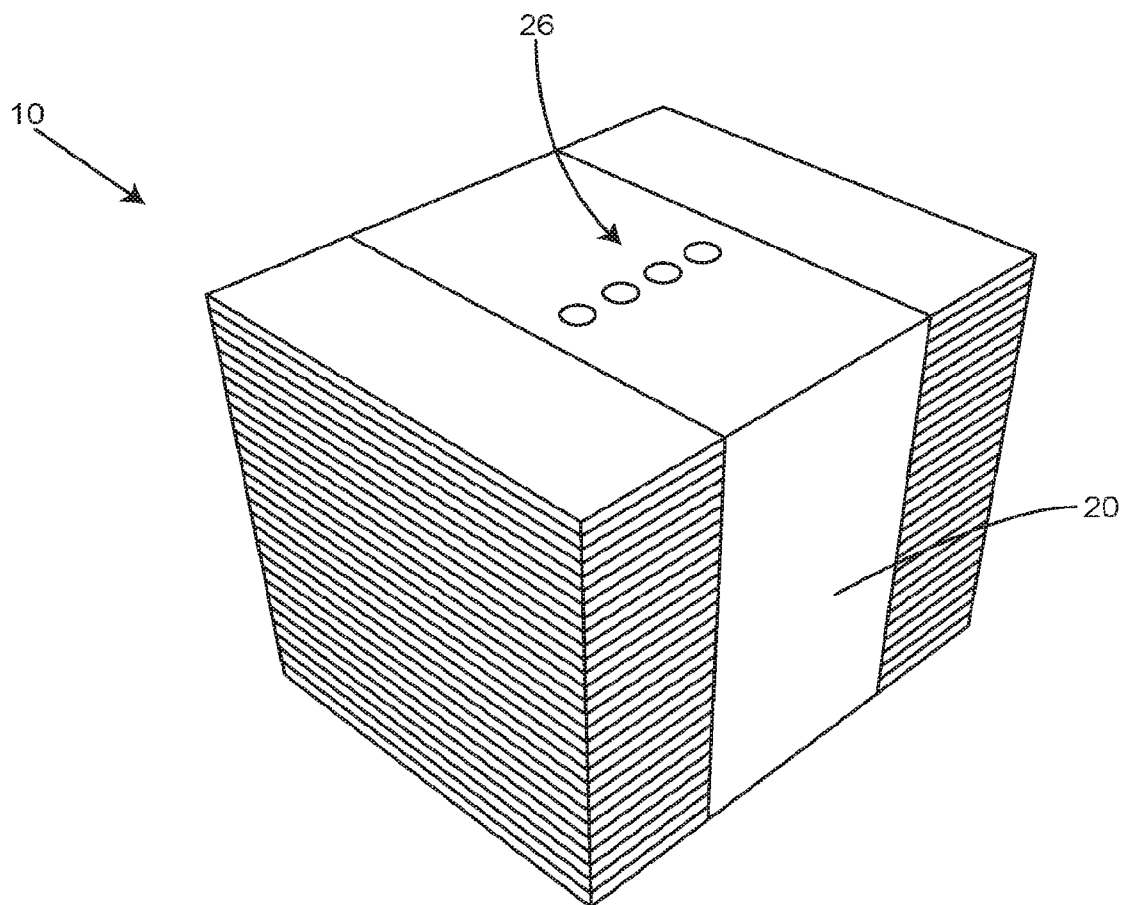


FIG. 2E

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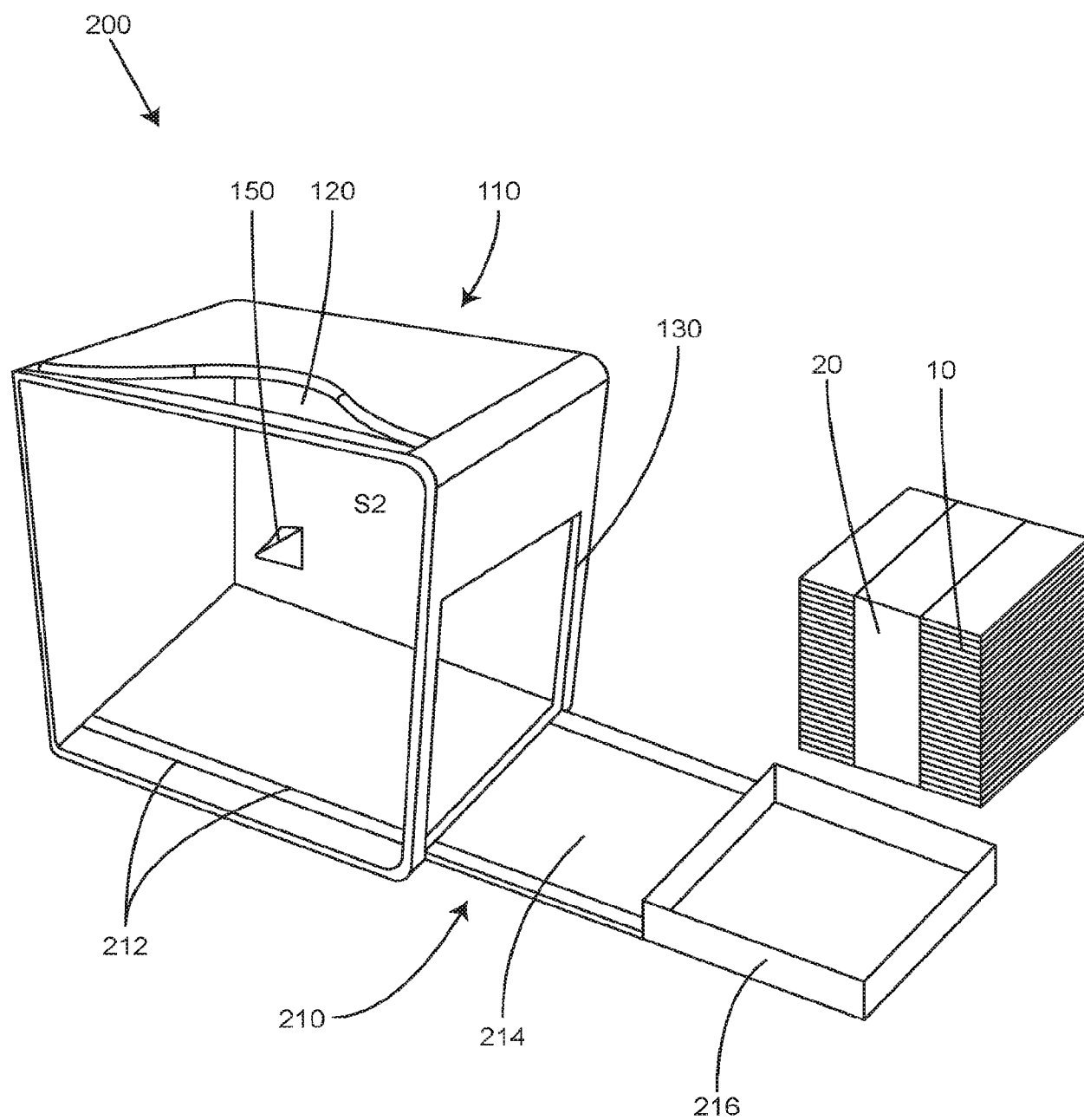


FIG. 3

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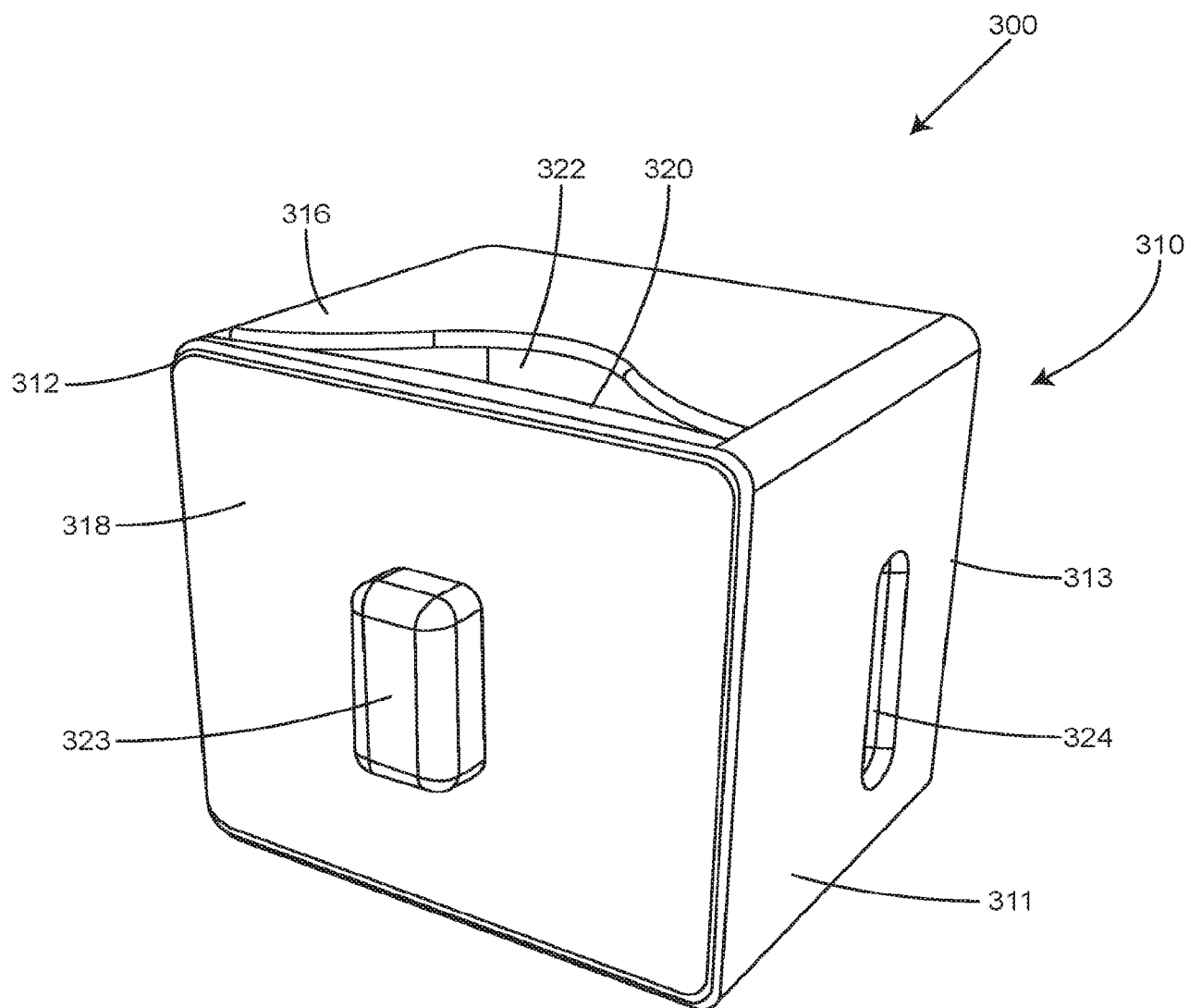


FIG. 4

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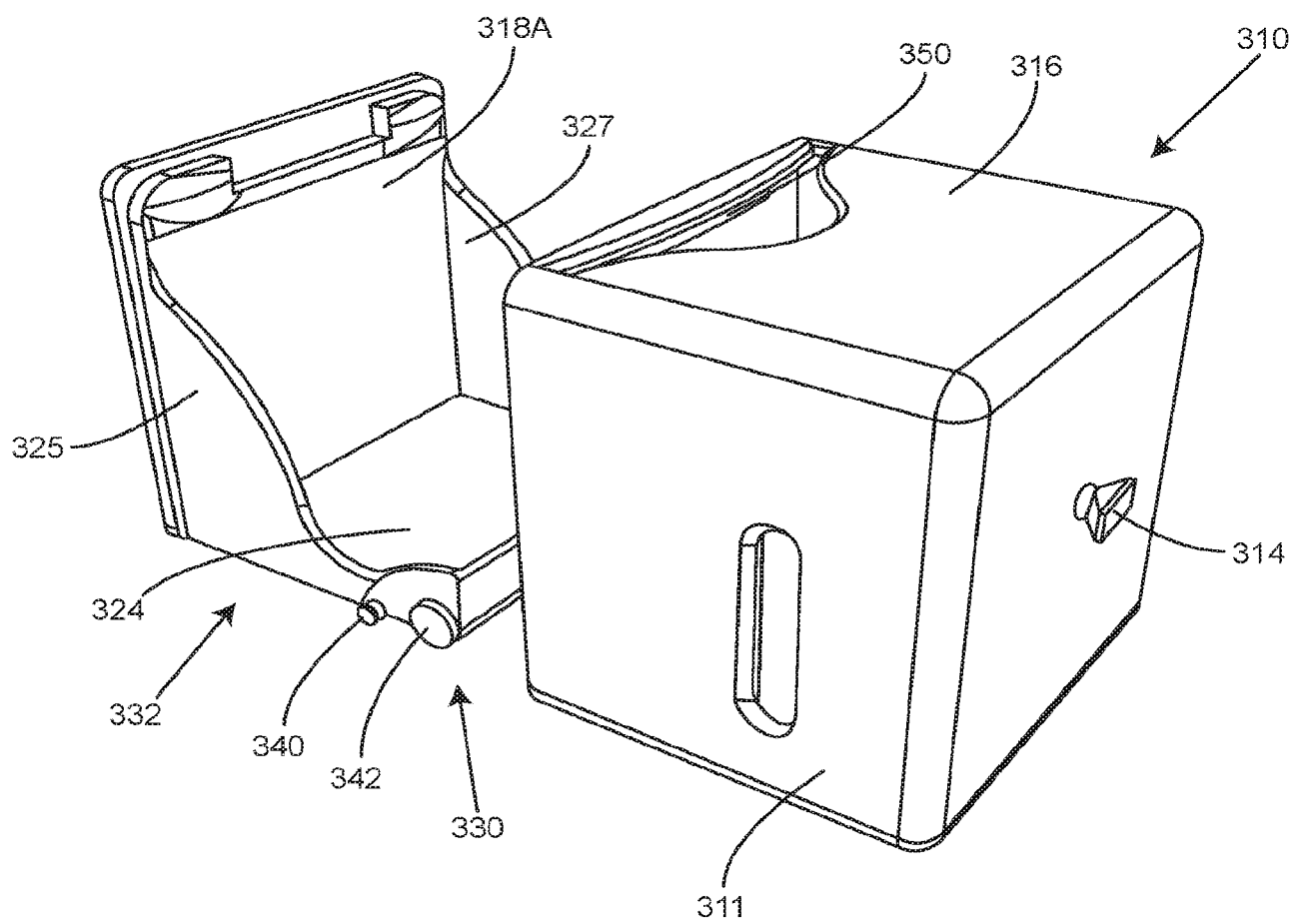


FIG. 5A

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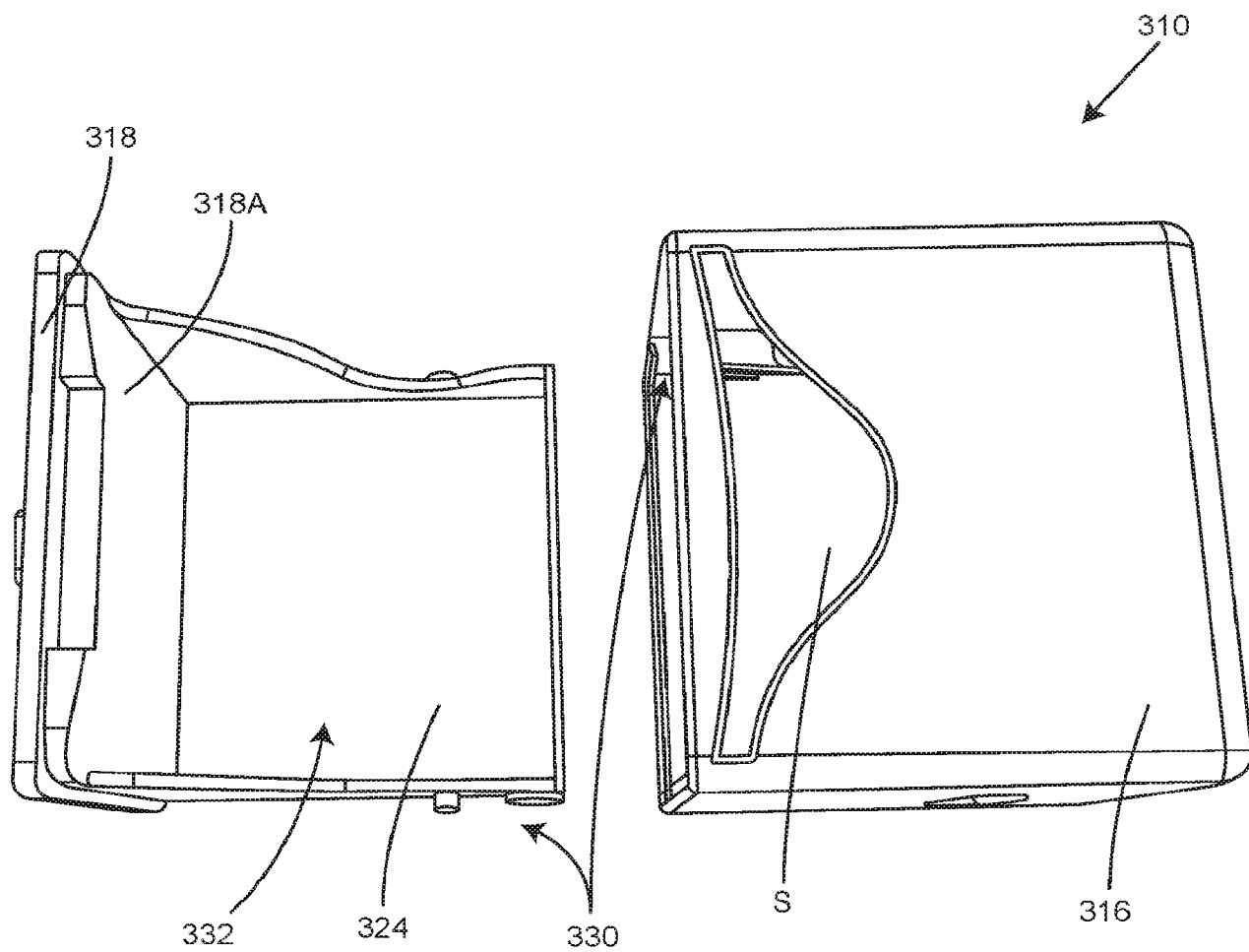


FIG. 5B

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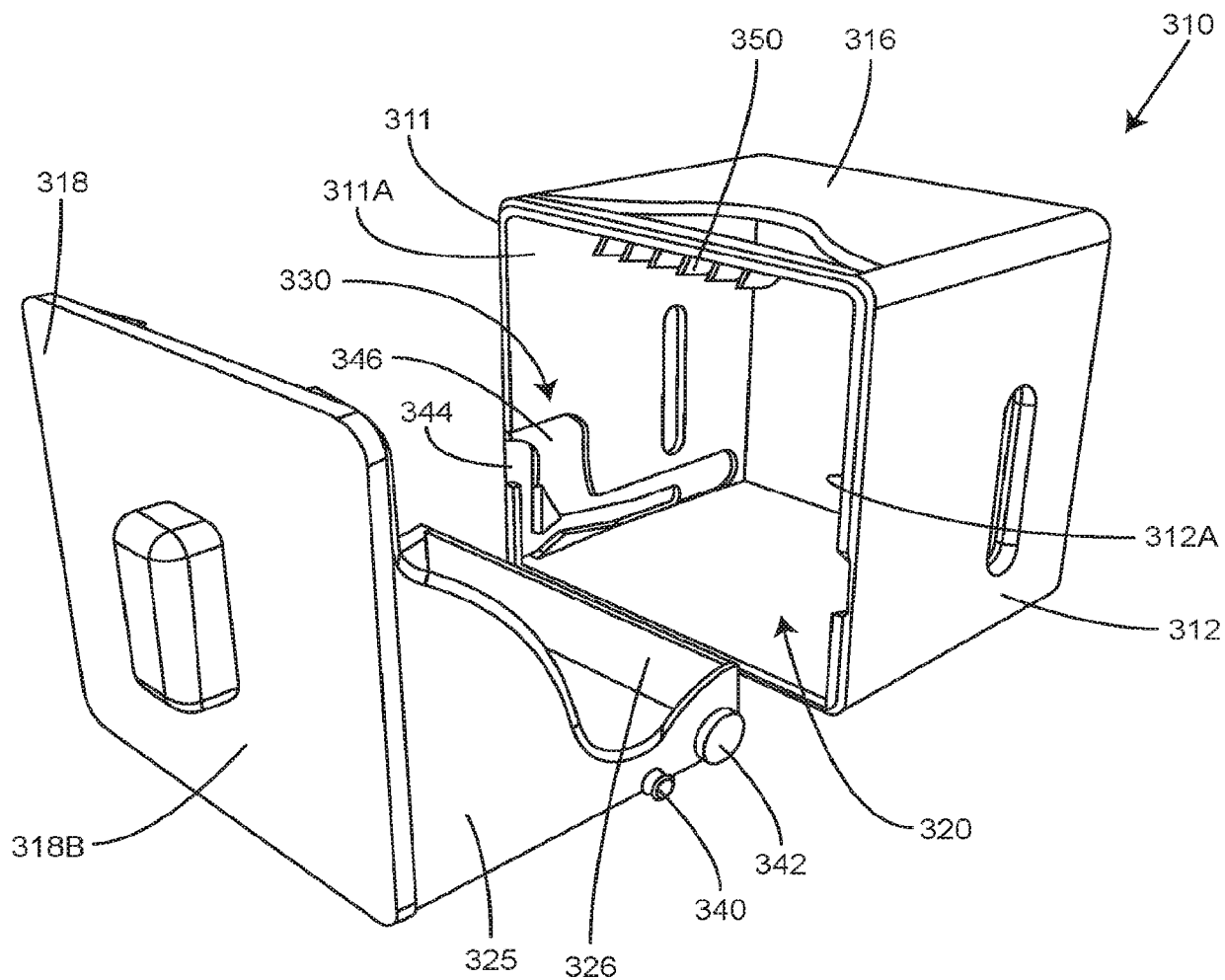


FIG. 5C

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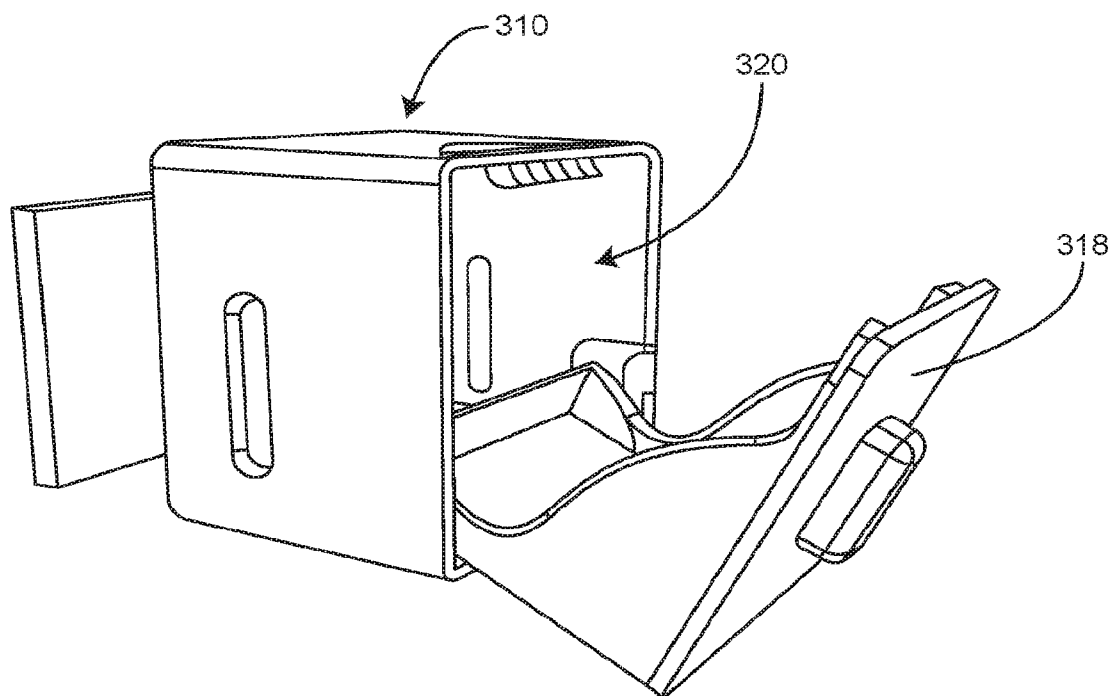


FIG. 6A

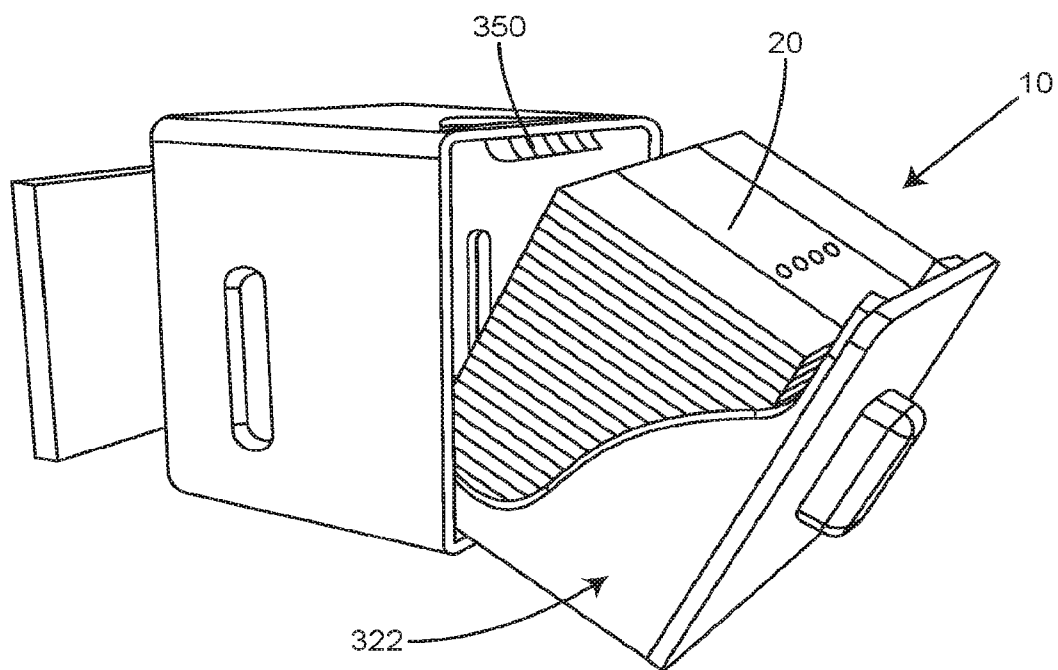


FIG. 6B

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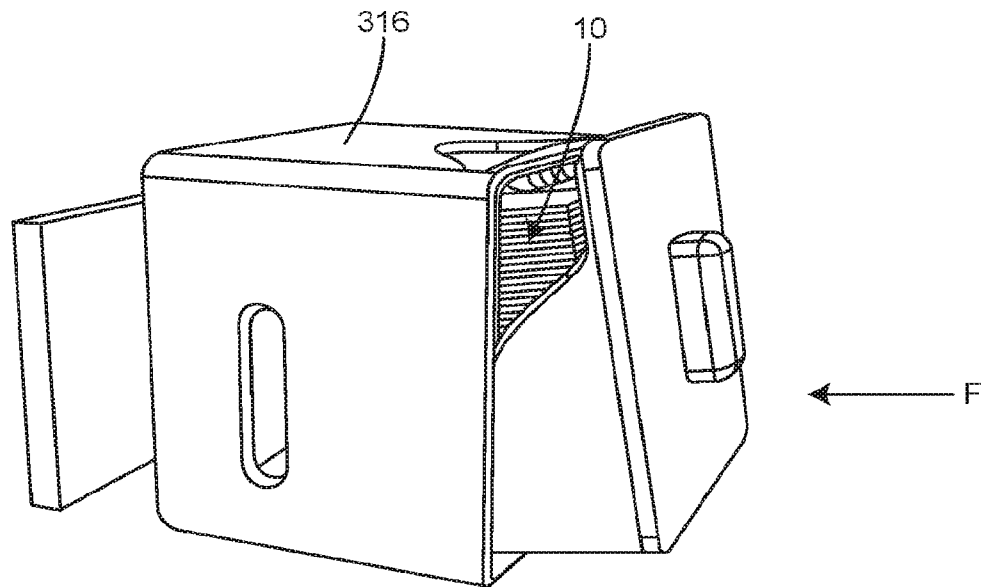


FIG. 6C

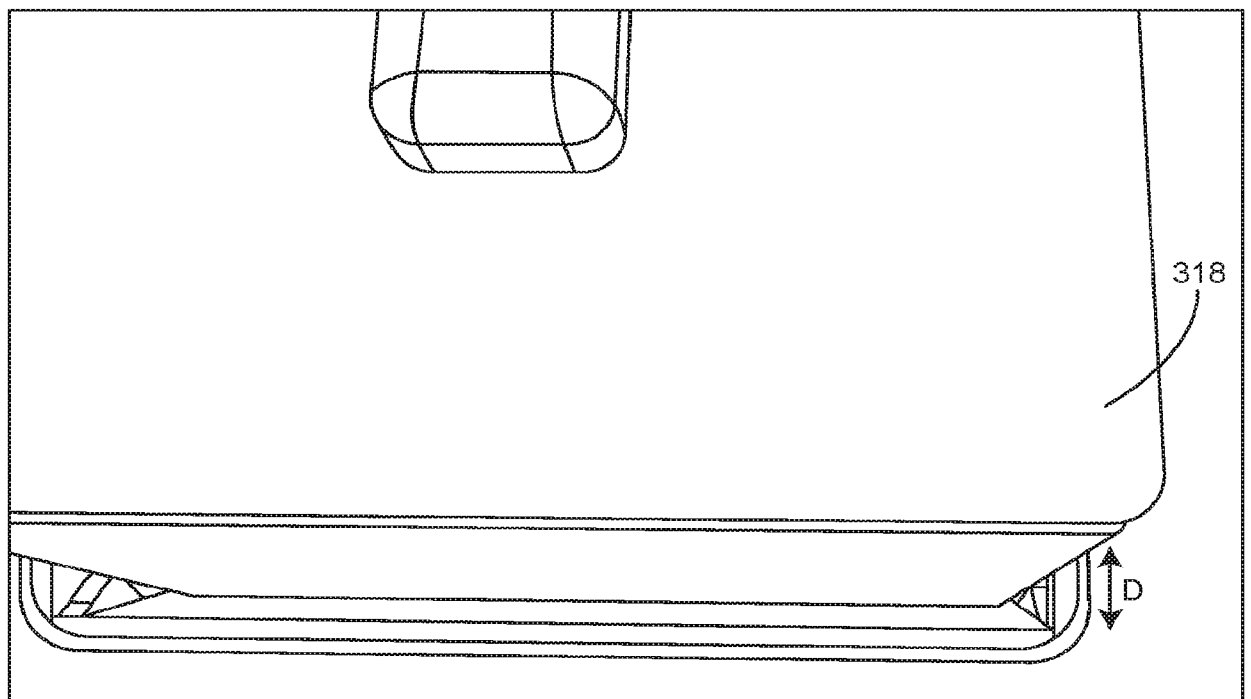


FIG. 6D

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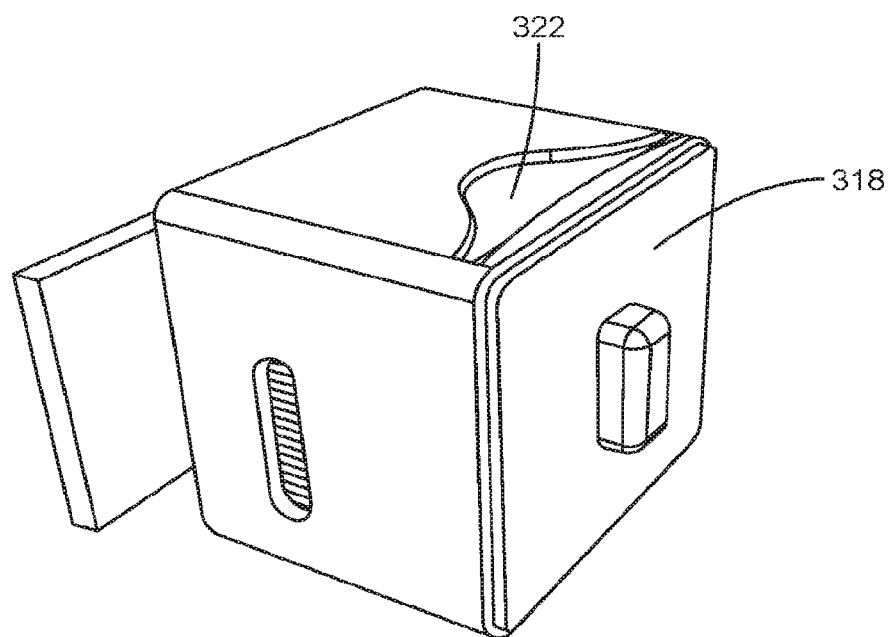


FIG. 6E

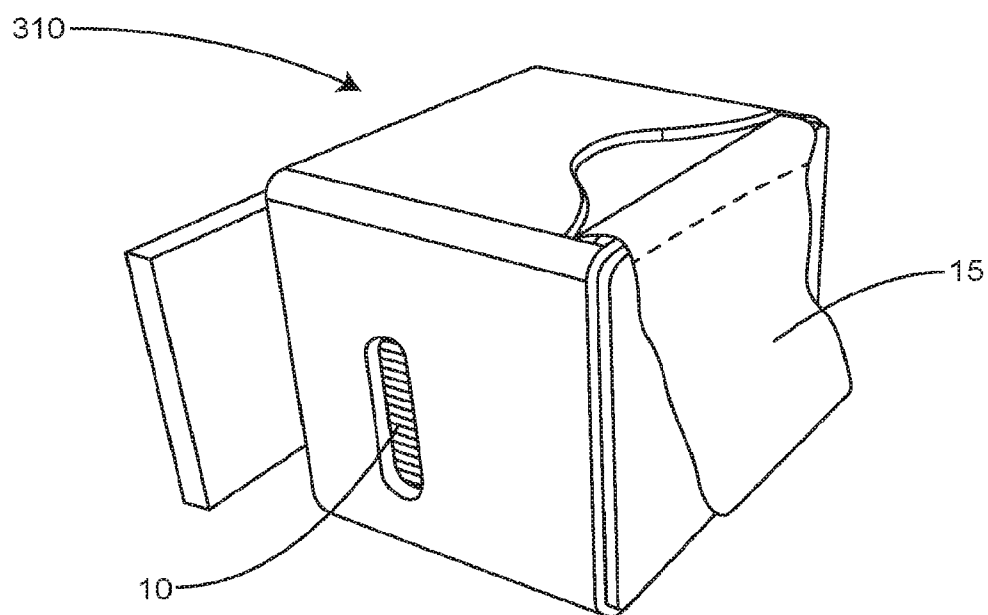


FIG. 6F

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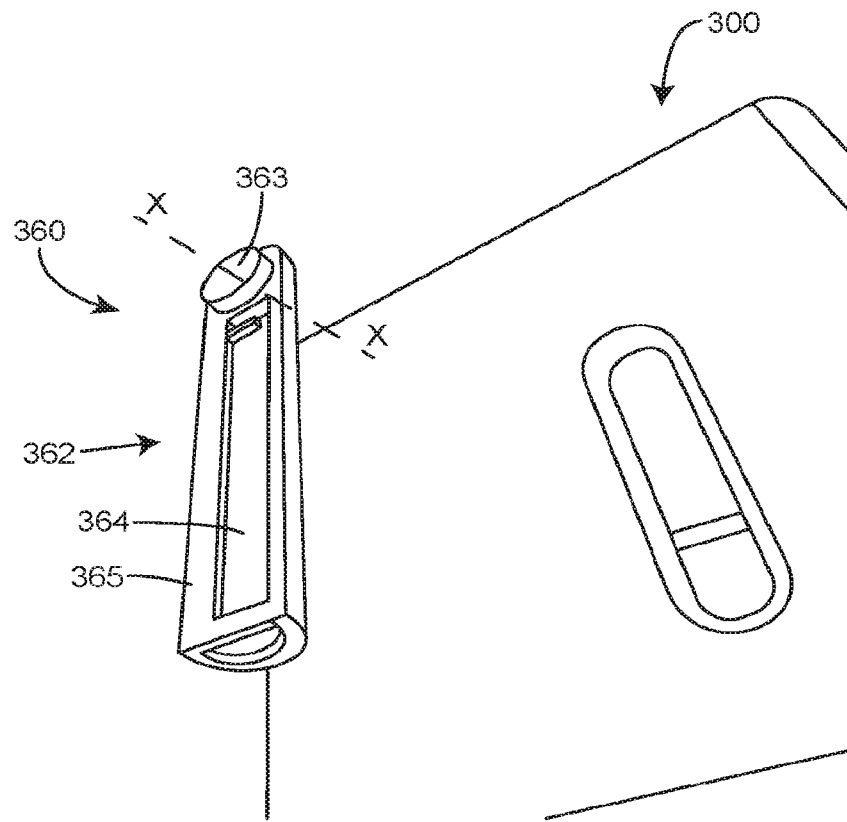


FIG. 7A

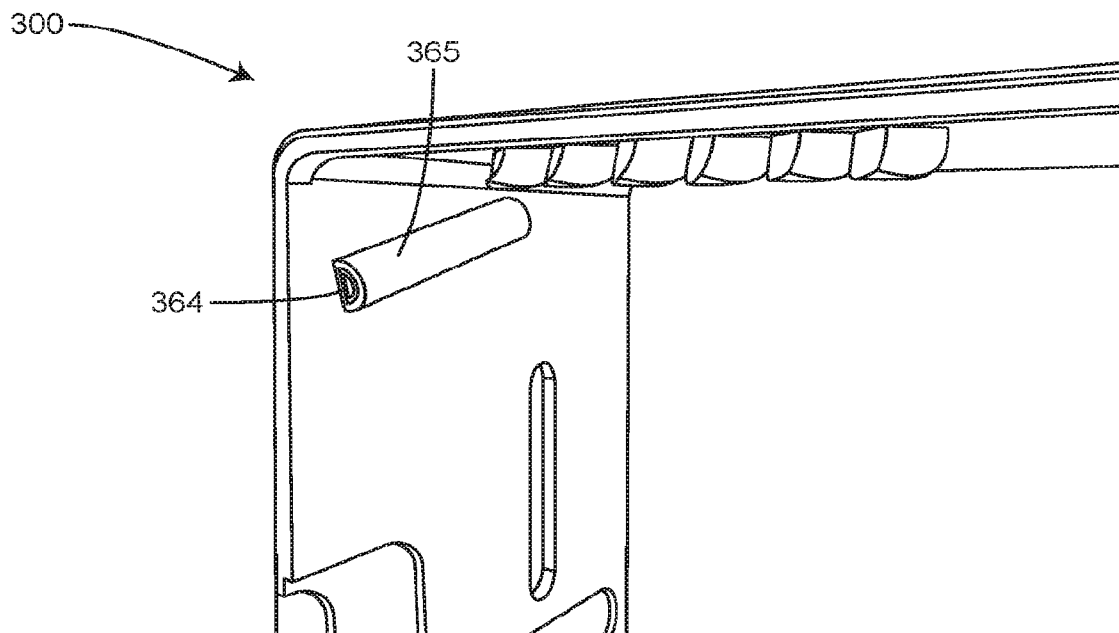


FIG. 7B

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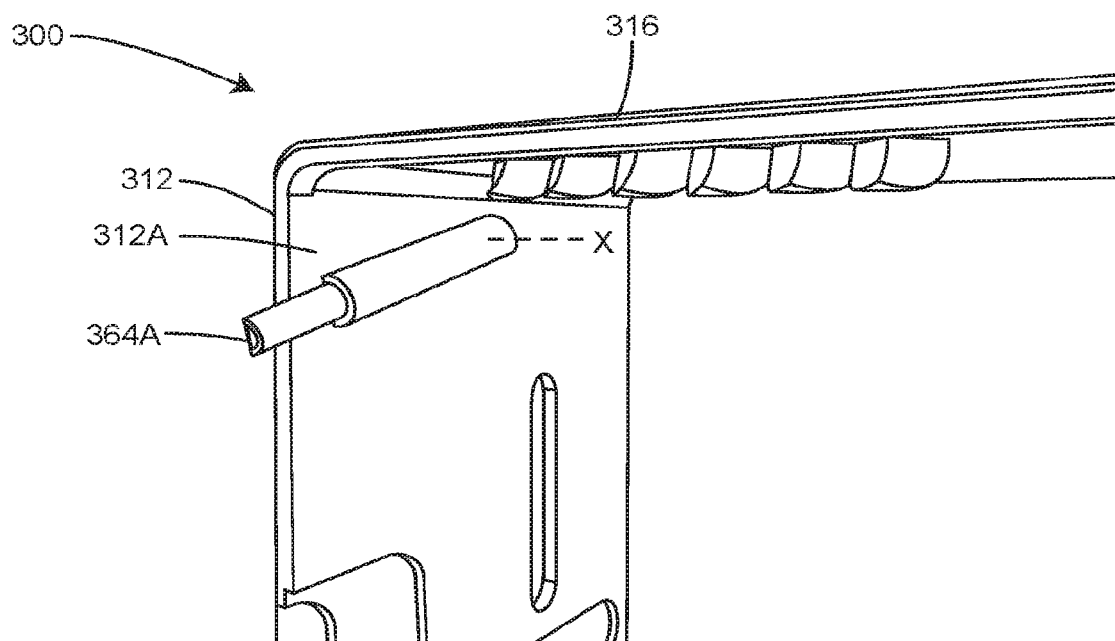


FIG. 7C

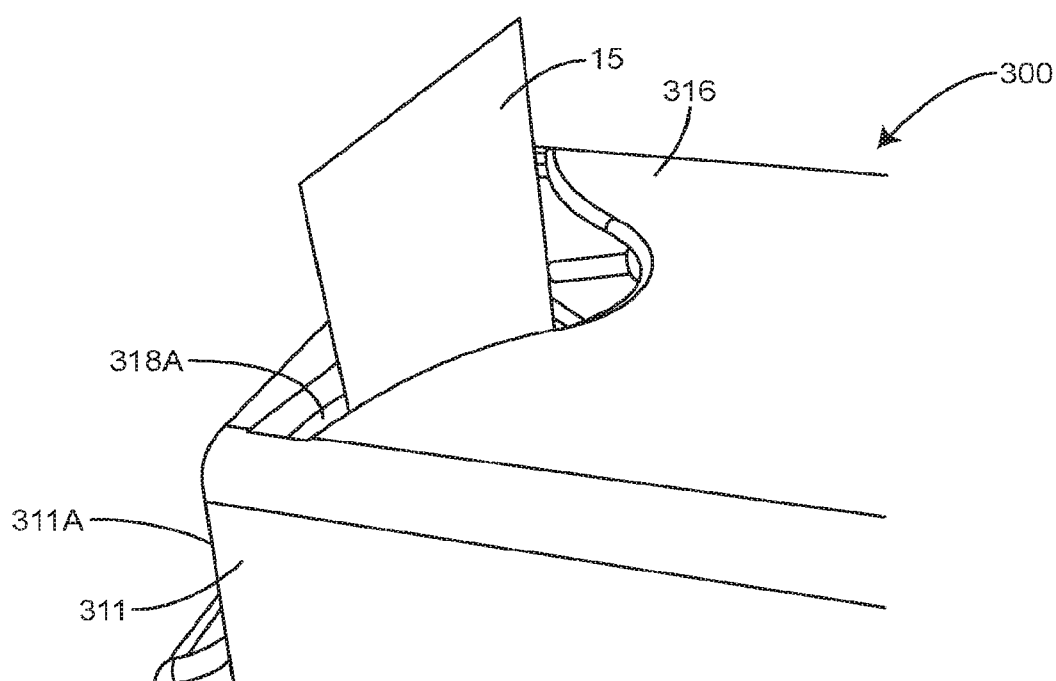


FIG. 7D

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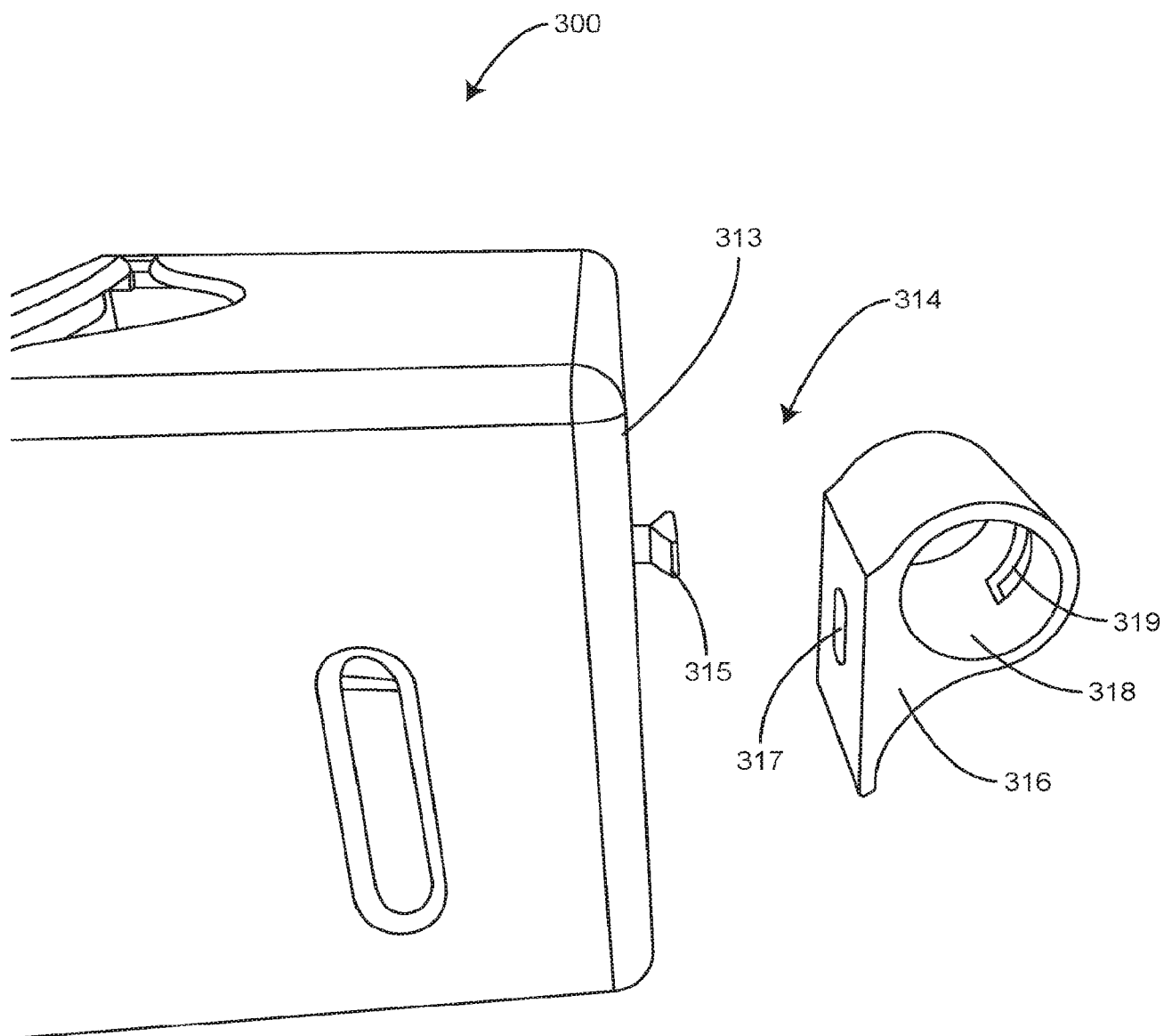


FIG. 8A

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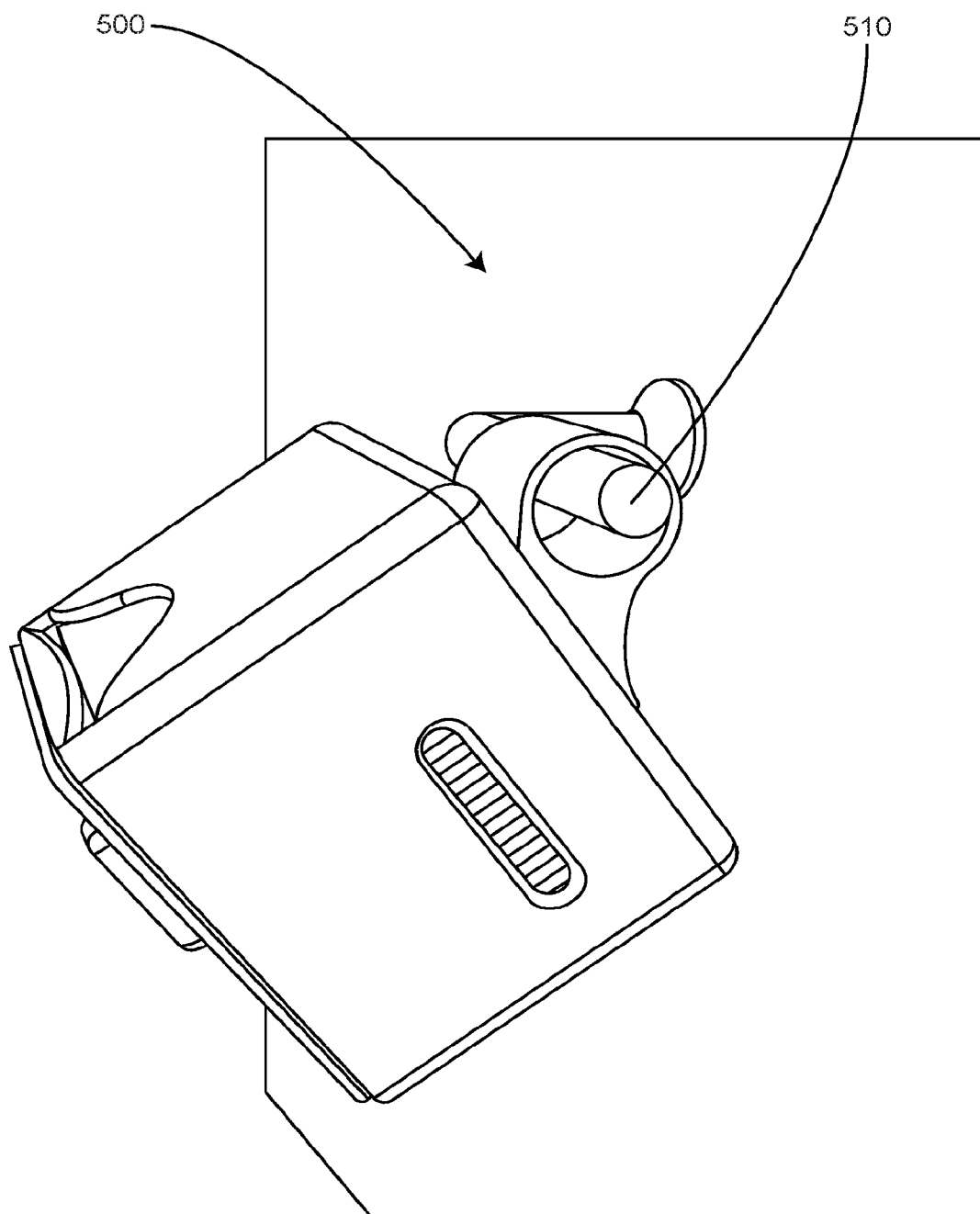


FIG. 8B

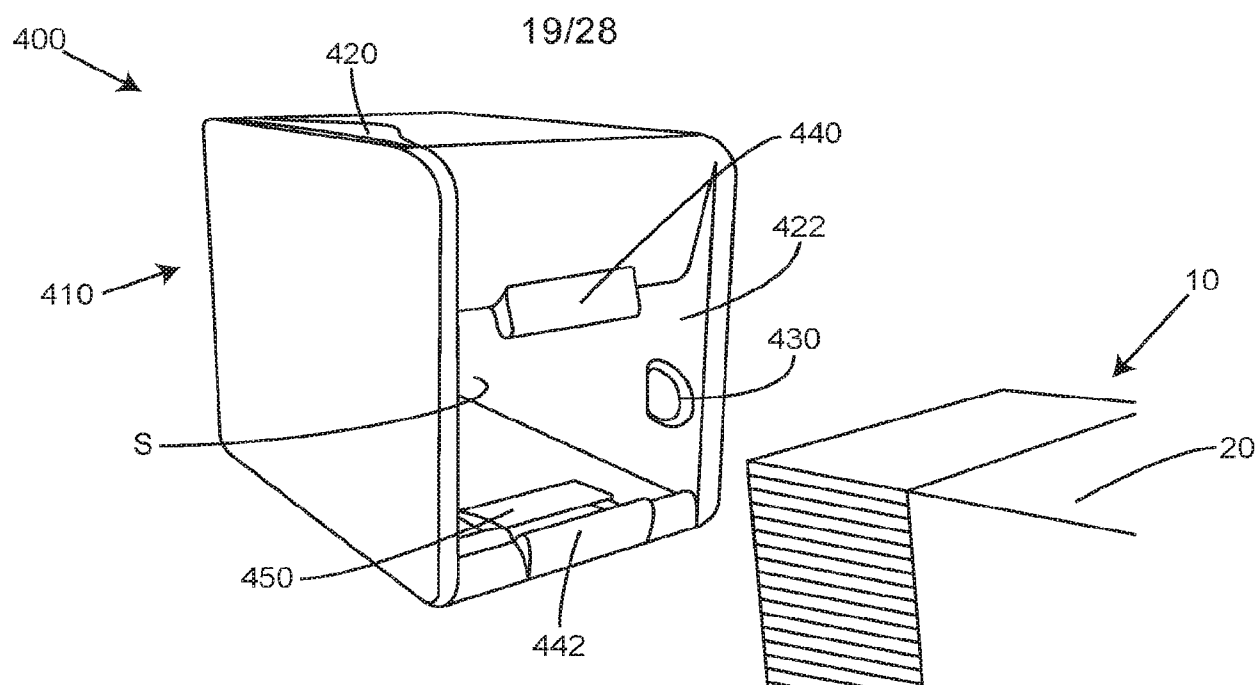


FIG. 9A

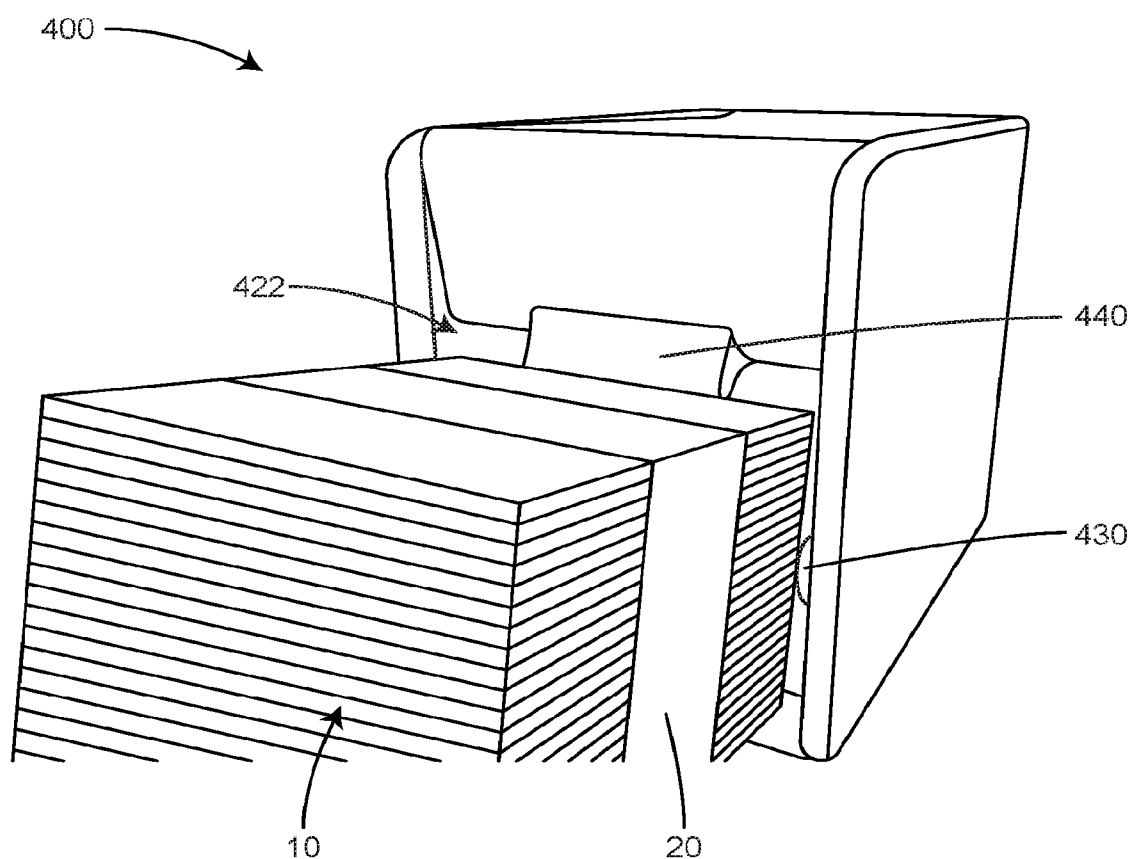


FIG. 9B

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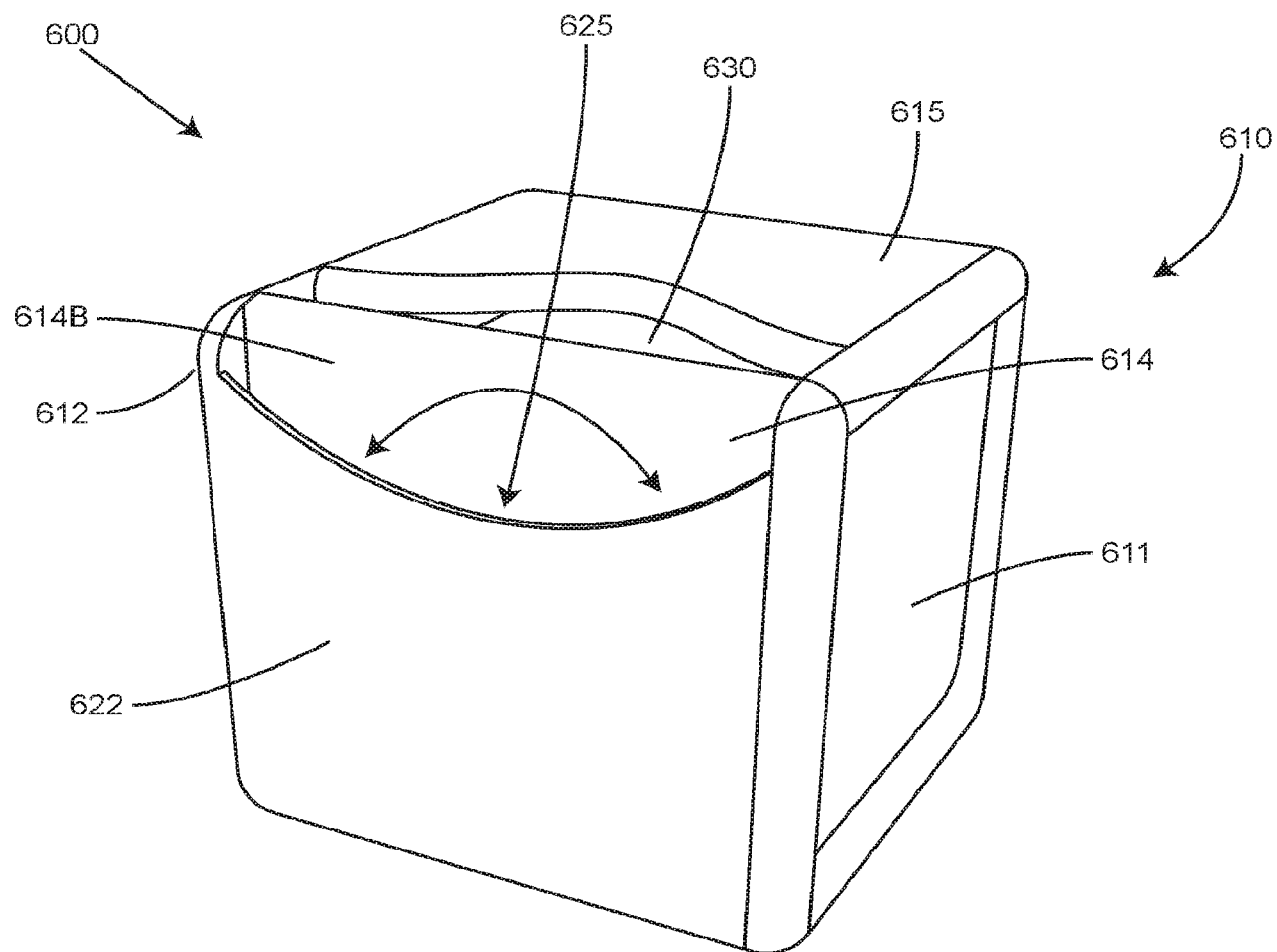


FIG. 10A

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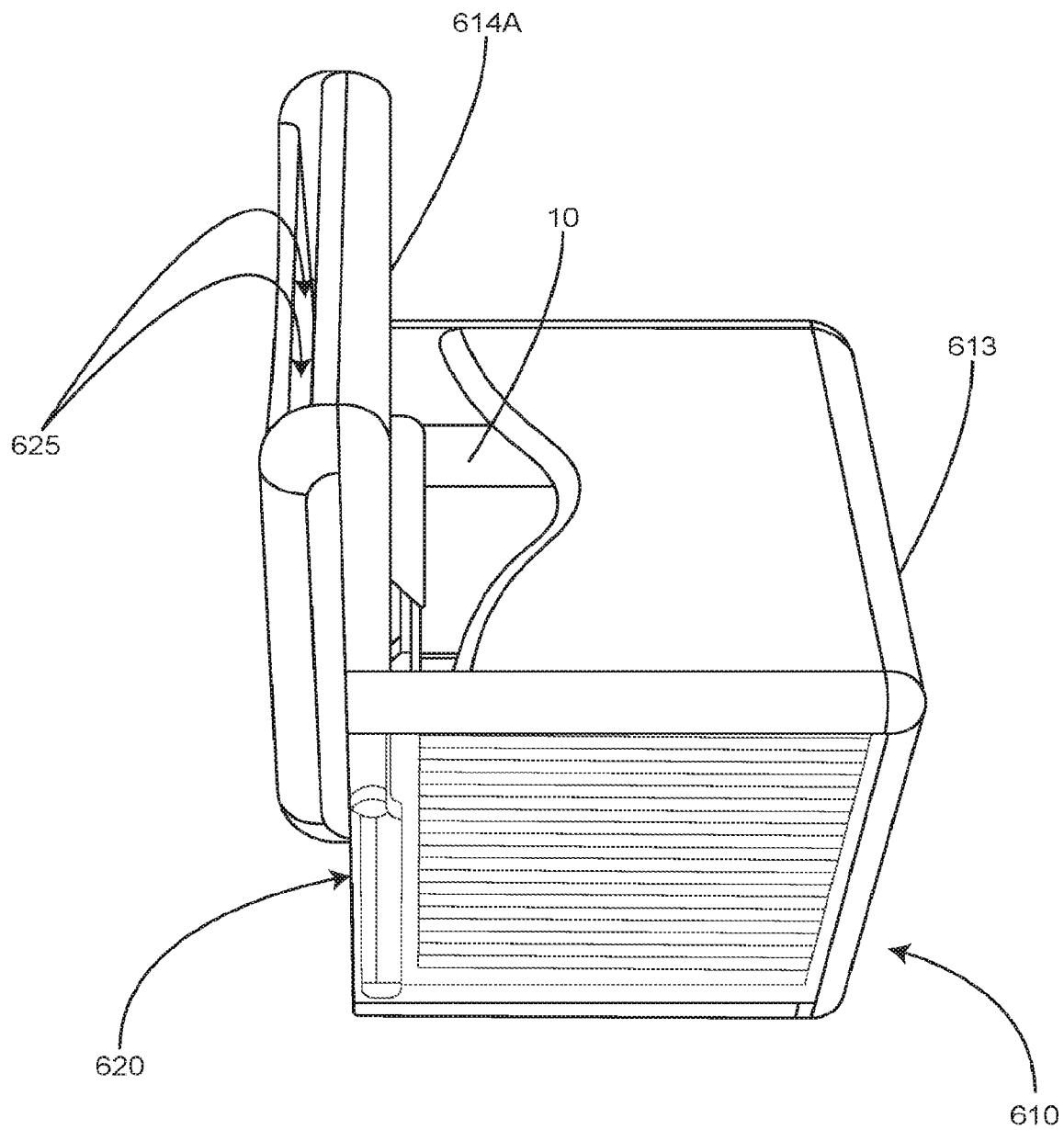


FIG. 10B

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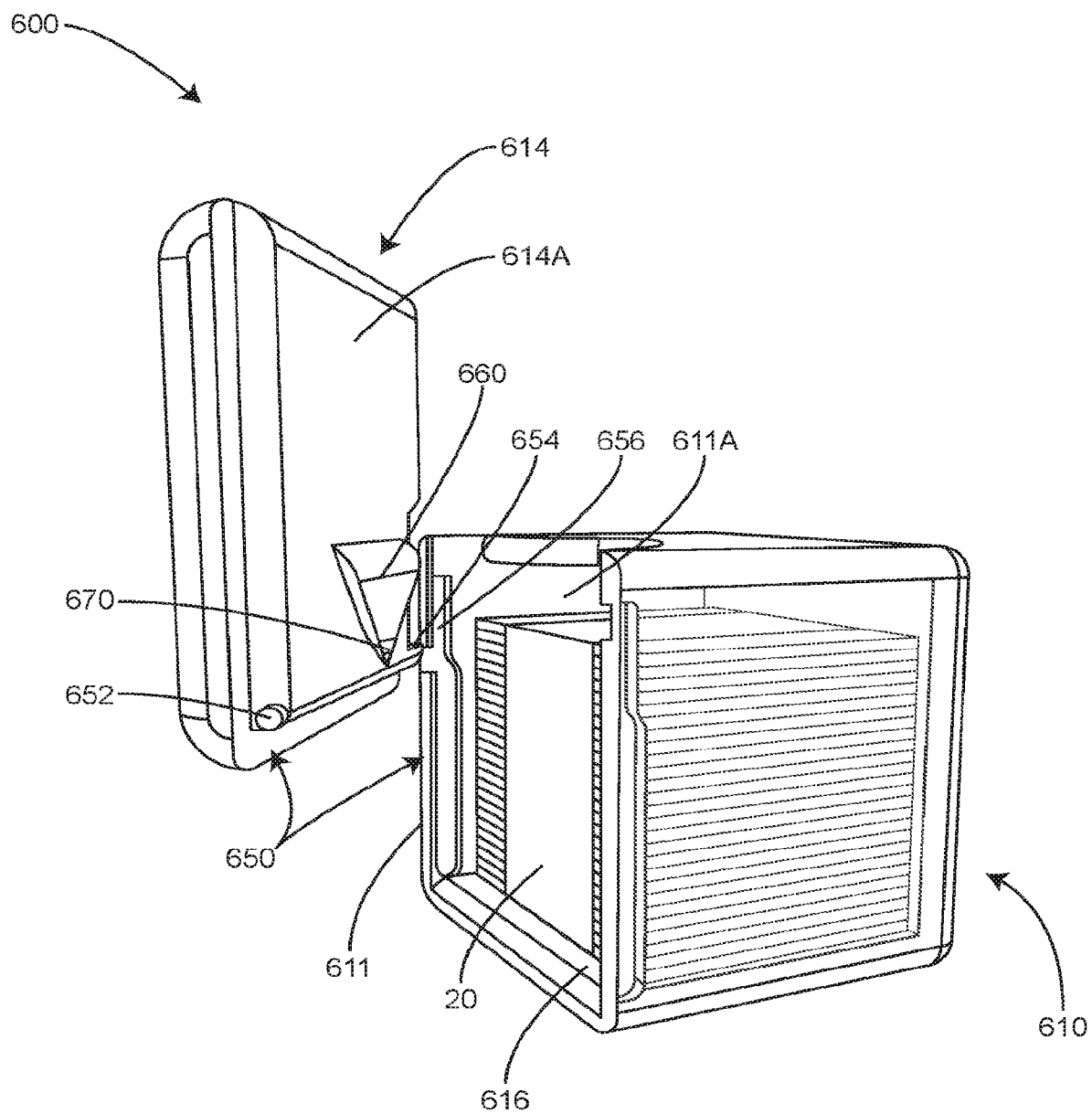


FIG. 11A

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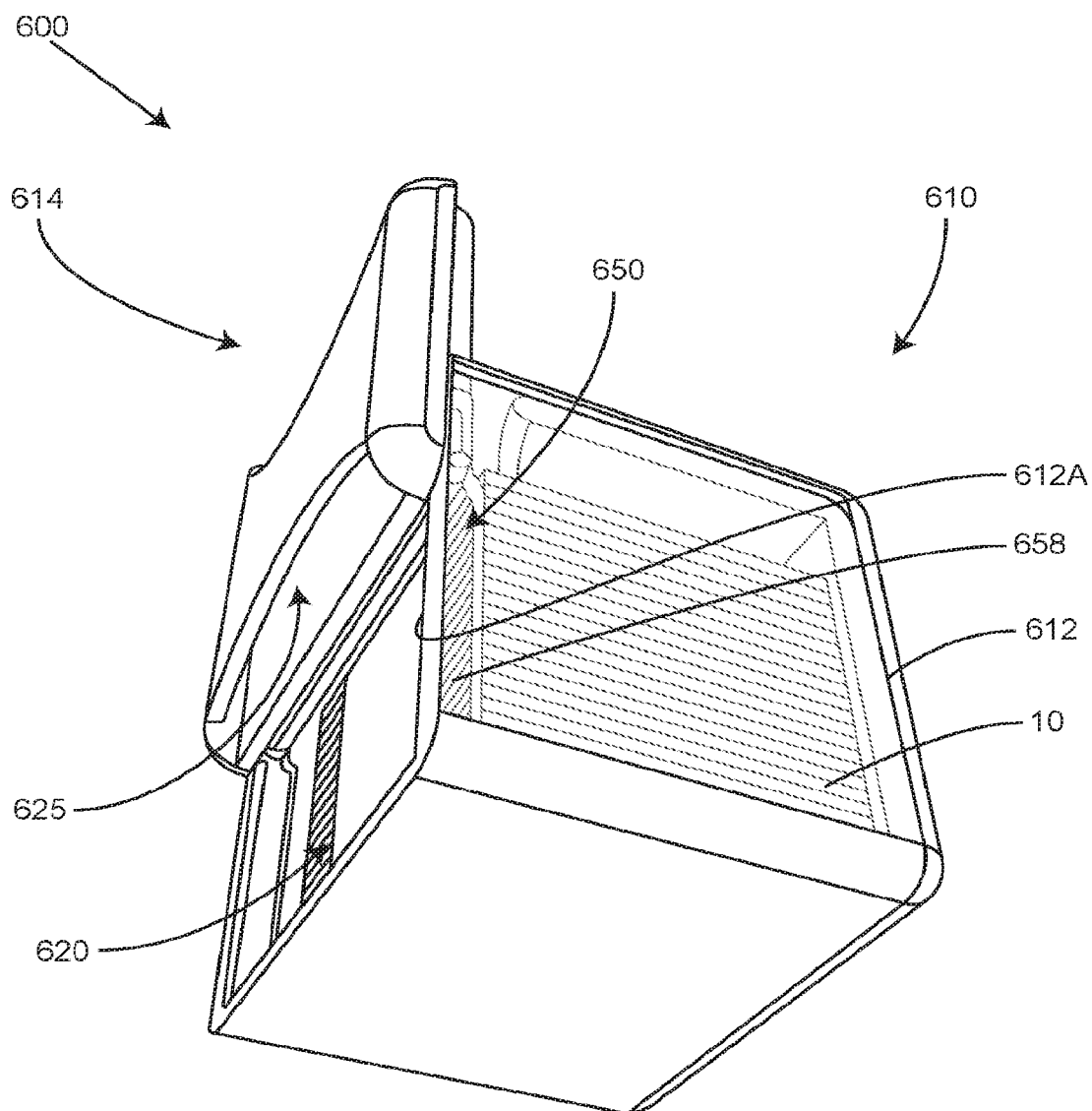


FIG. 11B

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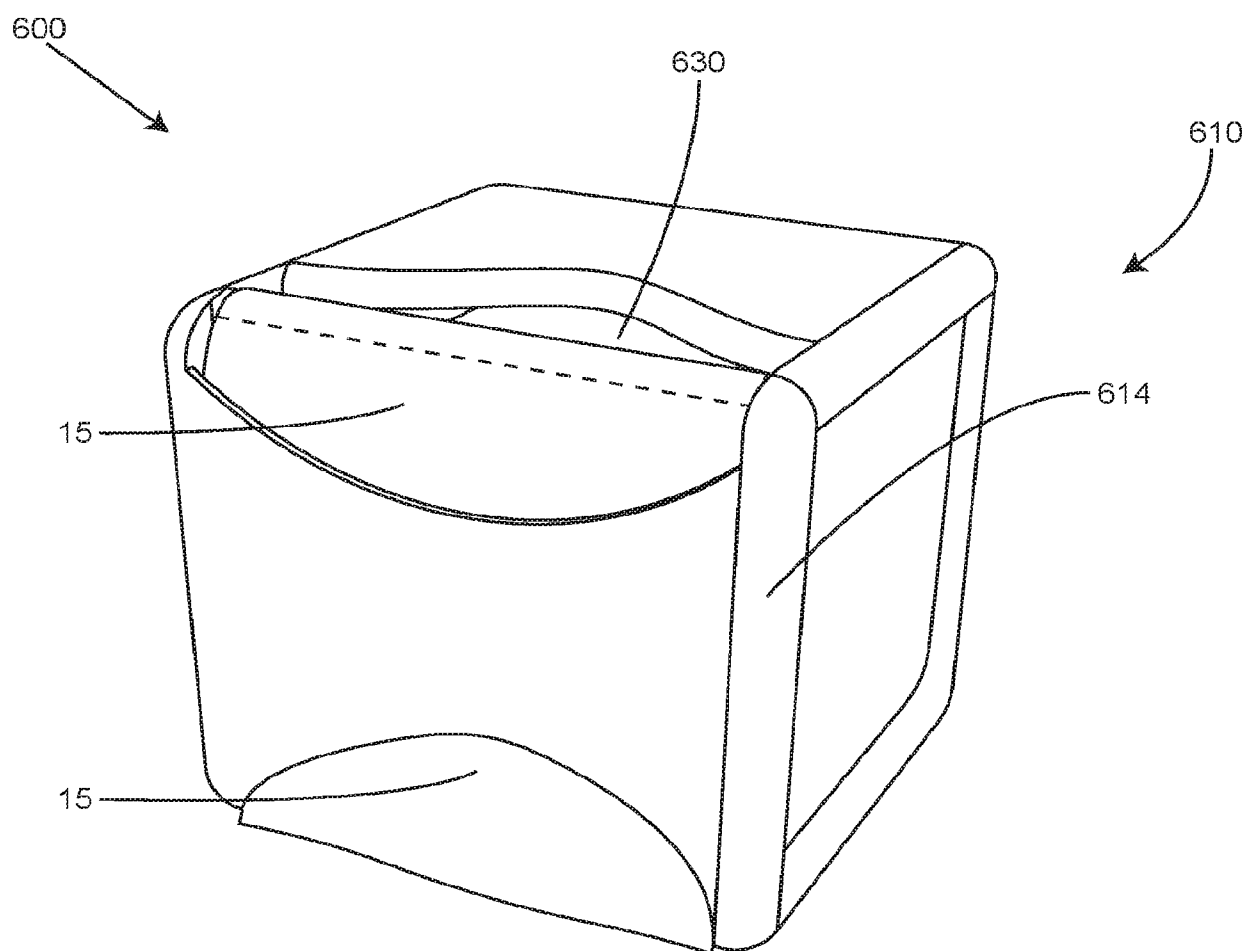


FIG. 11C

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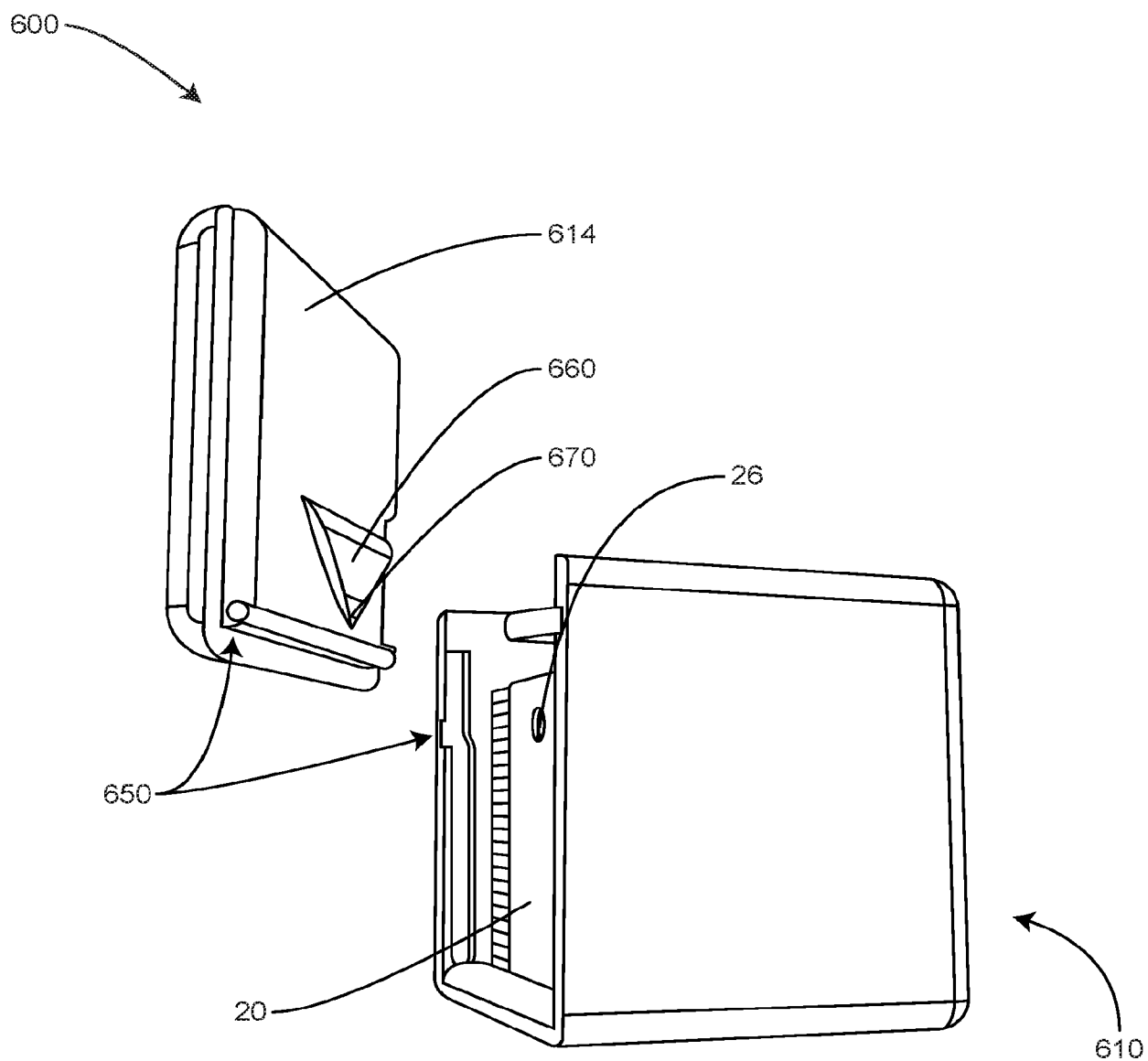


FIG. 12A

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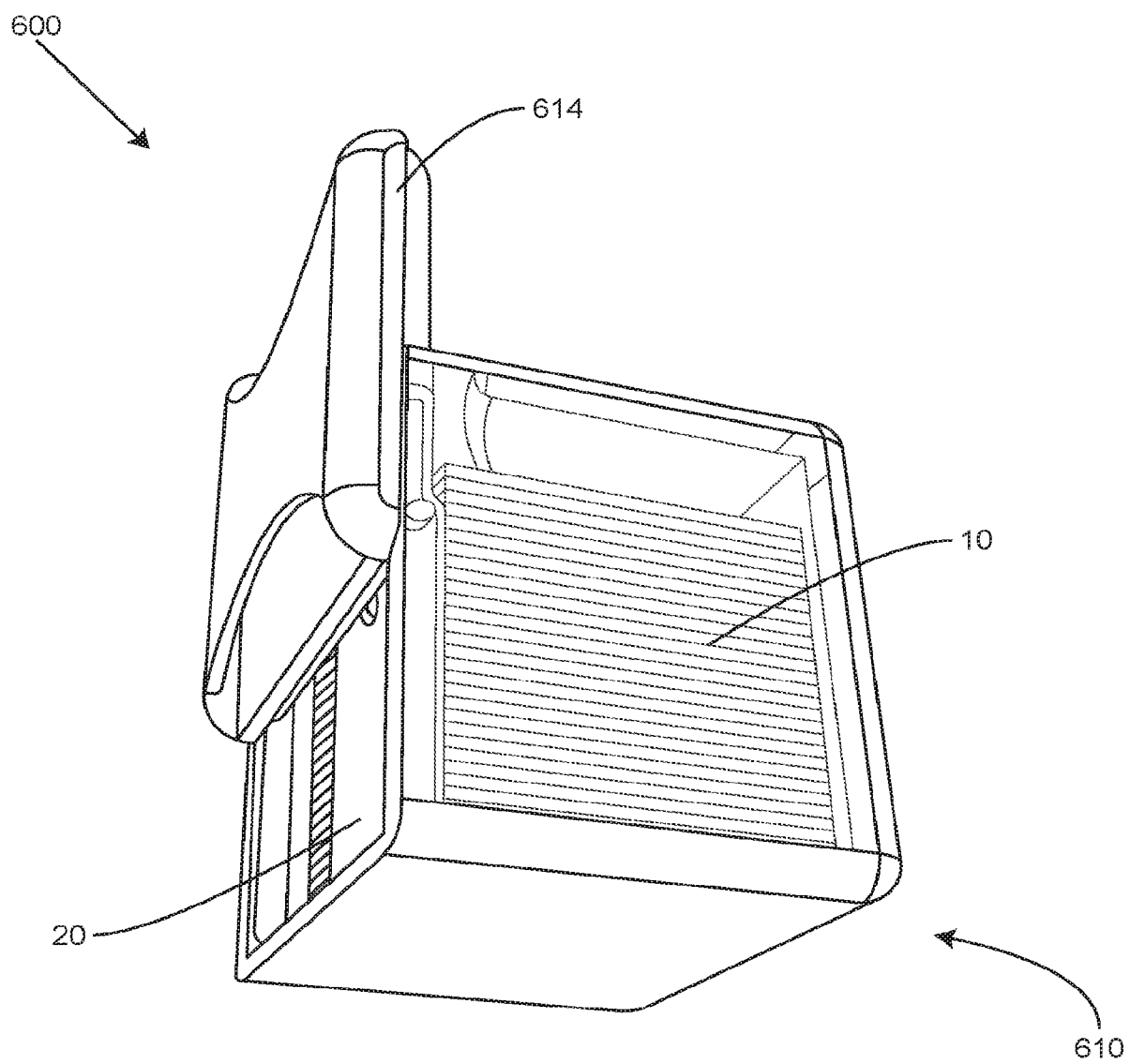


FIG. 12B

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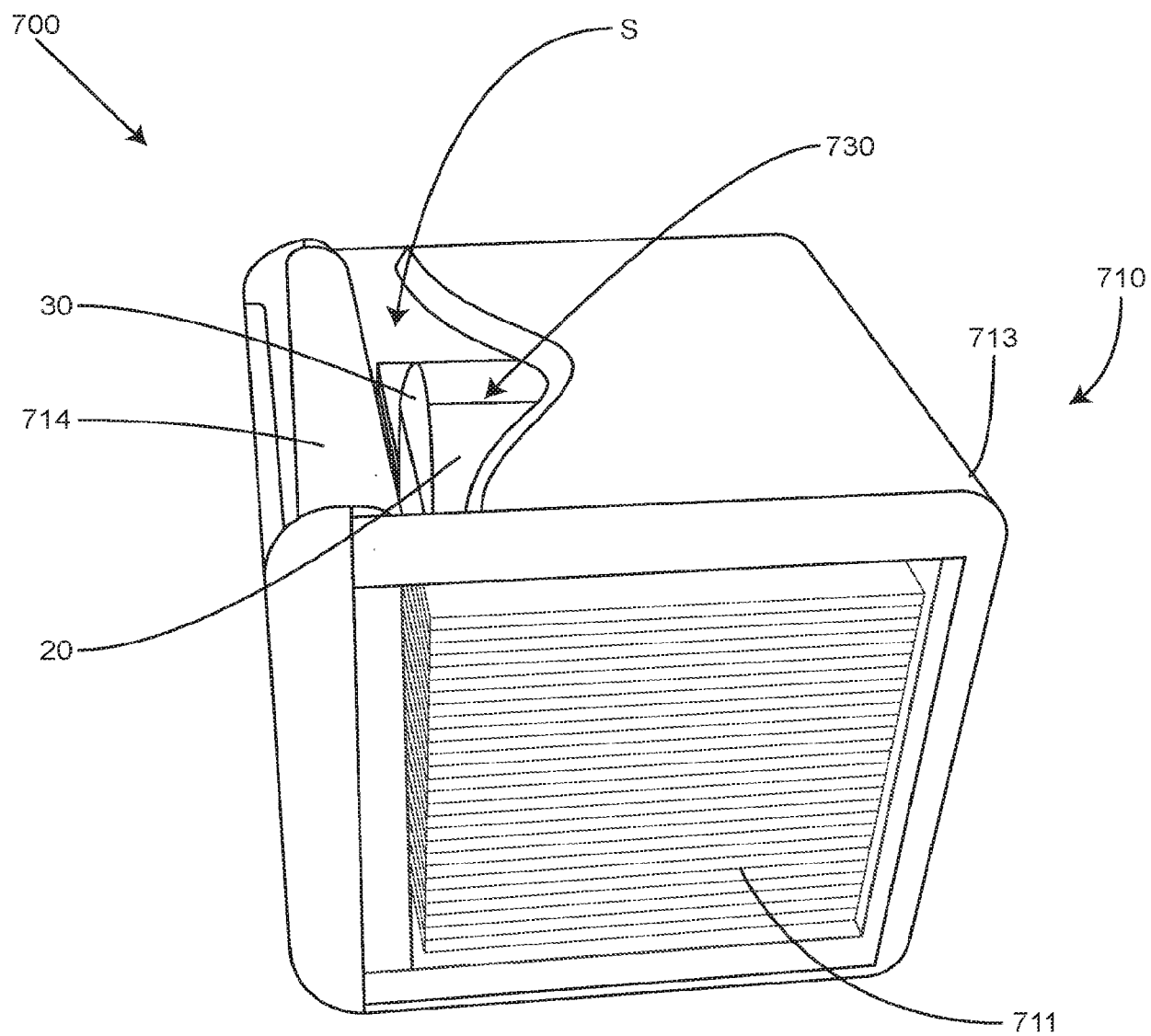


FIG. 13A

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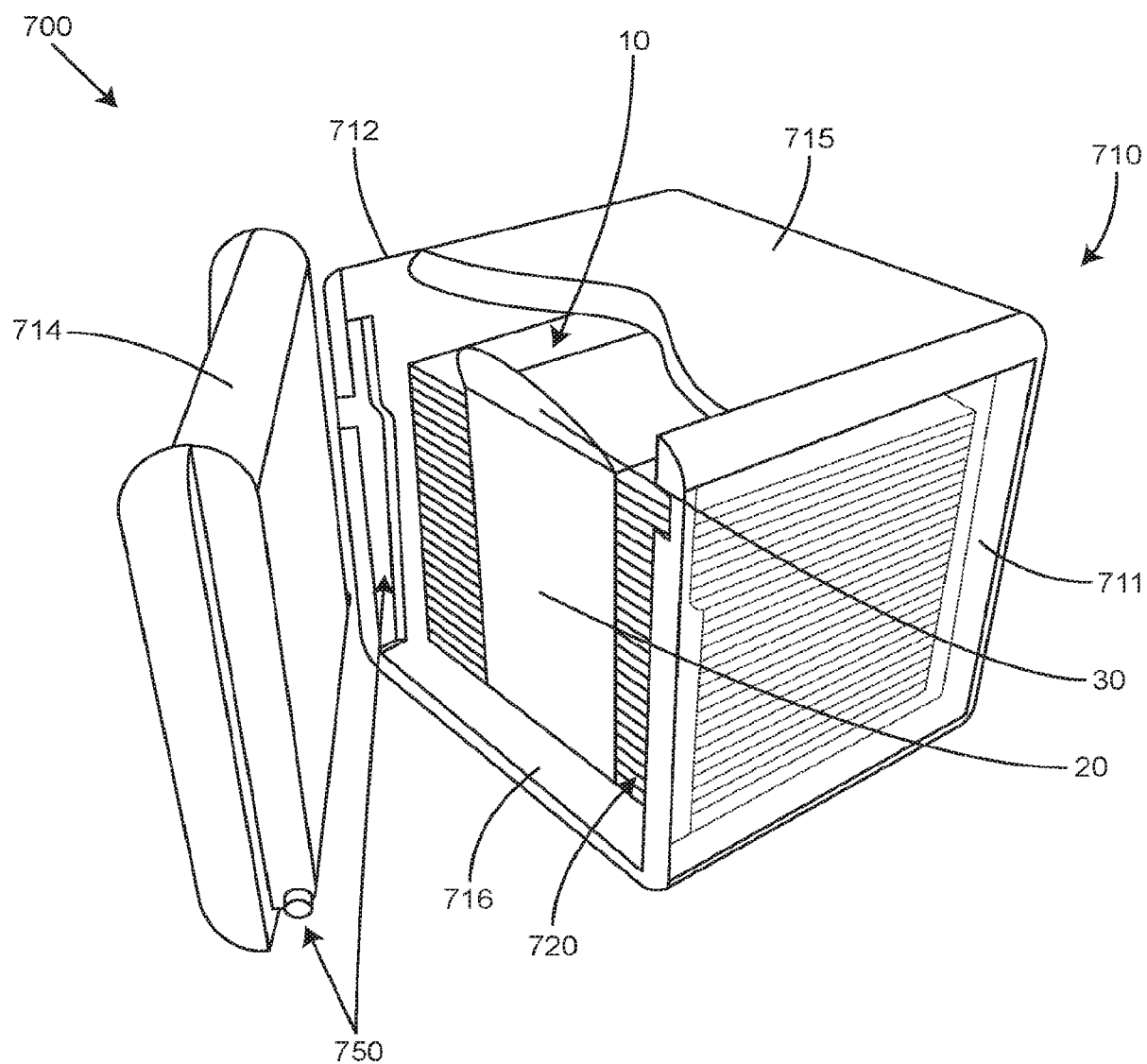


FIG. 13B

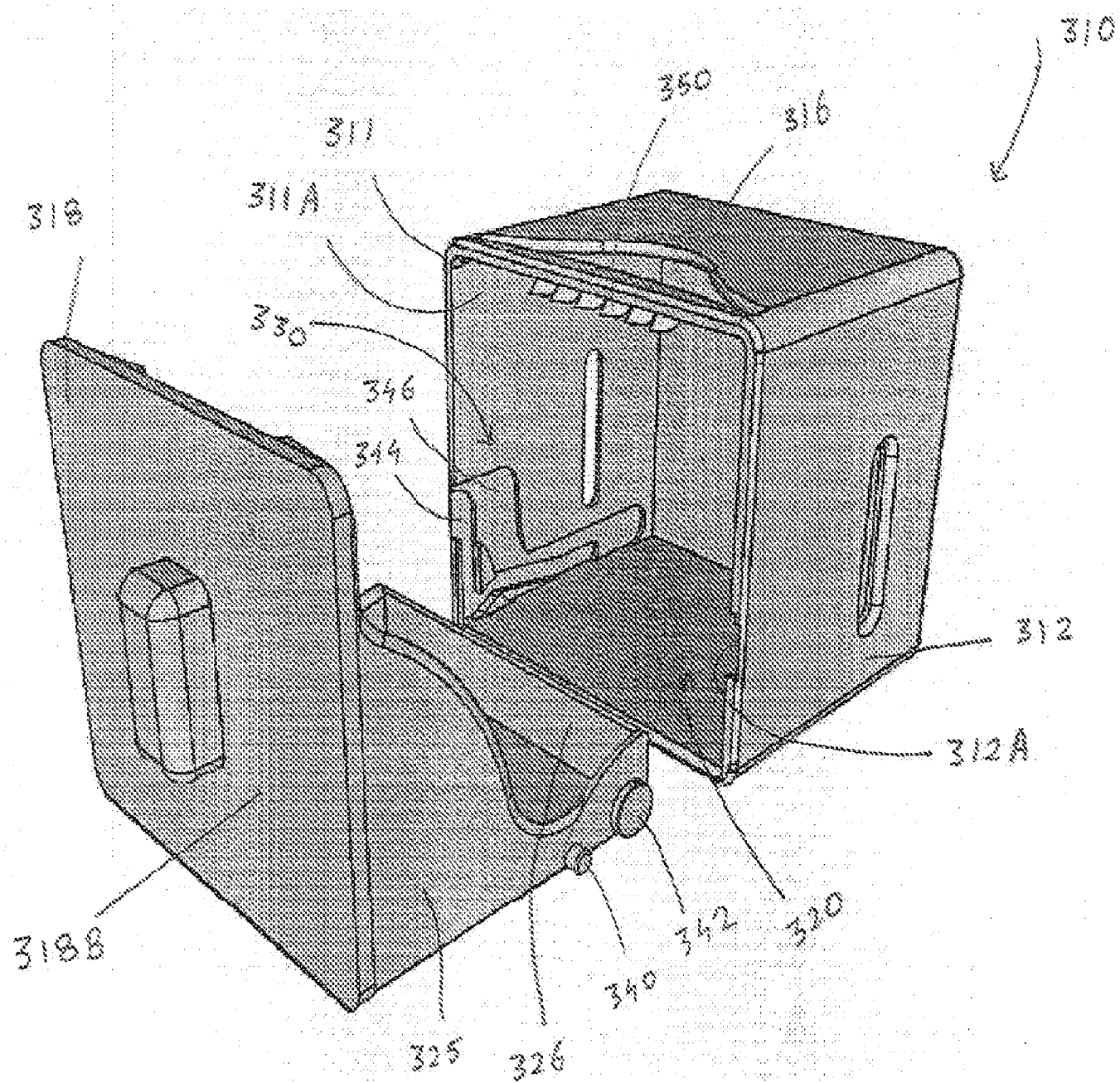


FIG. 5C