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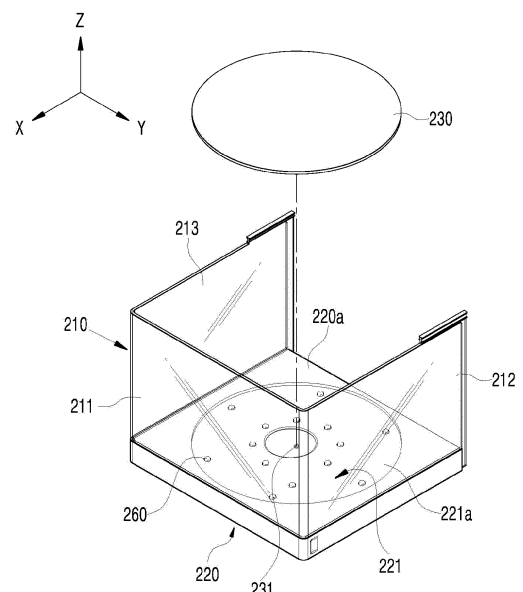
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(54) **SHOE CARE APPARATUS**

(57) A shoe care apparatus is disclosed. A shoe care apparatus according to an embodiment of the present invention comprises a main body, a moving body, and an air-blowing part. The main body and the moving body together form an accommodation space. A shoe is accommodated in the accommodation space. The air-blowing part circulates air in the accommodation space. The moving body comprises a base, a turntable, and a plurality of rotating balls. The base is slidably coupled to the main body so as to open and close the accommodation space. The turntable is rotatably coupled to the base about a vertical axis. The turntable forms a lower surface of the accommodation space together with the base. The rotating balls are rotatably coupled to the base. The rotating balls are in point-contact with a bottom surface of the turntable and support a load of the turntable.

FIG. 5c



Description

[Technical Field]

[0001] The present invention relates to a shoe care device (shoe care apparatus), and more particularly, to a shoe care device that manages and displays shoes stored therein.

[Background Art]

[0002] Only when shoes should be properly kept, the shoes can be worn for a long time without breaking the shape of the shoes. When the shoes are stacked in layers, the shape can be deformed. In general, a shoes cabinet is used for organization and keeping of the shoes.

[0003] In recent years, people who collect shoes of popular brands as part of hobby or financial tech have appeared, and a show case has been disclosed which is configured to keep and display the shoes.

[0004] Korean Publication Patent No. 2017-0130045 (hereinafter referred to as the "prior document") discloses a "turntable-type 3D image lighting device (three dimensions picture lighting device of turn table type)". The turntable-type three-dimensional image lighting device includes a base, a transparent window, a first light-emitting element, a turntable, a cover plate, a second light-emitting element, and a control panel.

[0005] The base is provided on a lower part of the turntable-type 3D image lighting device. The base has a box shape. A driving motor is disposed in the base. The turntable is disposed above the base. The turntable is rotated by the driving motor. The control panel controls the driving motor. When the driving motor is driven by the manipulation of the control panel, a product (hereinafter referred to as the "exhibit") placed on the upper surface of the turntable is rotated with the turntable.

[0006] The rotational force of the driving motor is transmitted to a rotation shaft of the turntable via a reducer or the like. A plurality of bearings are coupled to the base. The bearings fix the rotation shaft of the turntable in a constant position. The rotation shaft of the turntable is rotatably supported by the plurality of bearings.

[0007] However, according to the prior document, since the radial movement of the turntable rotation shaft is suppressed by the plurality of bearings, the state in which the turntable stably supports the exhibit is likely to be affected by the position of the center of gravity of the exhibit.

[0008] For example, according to the prior document, the horizontality of the turntable is maintained by the bearings supporting the rotation shaft of the turntable in the rotation axis direction and/or the radial direction, so that when the center of gravity of the exhibit placed on the upper surface of the turntable is horizontally spaced from the rotation shaft of the turntable, nonuniformity/deviation occurs in the force applied to rollers and/or balls of the bearings in the rotation axis direction and/or radial direc-

tion of the turntable.

[0009] This is a major factor increasing the rate of mechanical wear of the bearings, as well as acts as a factor causing the wear and fatigue failure of parts to which the bearings are coupled, making it difficult to continuously maintain the state in which the turntable stably support the exhibit. In other words, there is a high risk that the horizontality of the upper surface of the turntable will be destroyed by the above-described wear and fatigue failure.

[0010] In addition, when nonuniformity/deviation occurs in the force applied to the rollers and/or balls of the bearings in the rotation axis direction and radial direction of the turntable, there is a risk that frictional forces may be concentrated on some of the rollers and/or balls of the bearings, thereby hindering the smooth rotation of the turntable and causing irregular fluctuations in the rotation speed of the turntable.

[0011] Furthermore, according to the prior document, the turntable is supported only by the rotation shaft. Thus, when the center of gravity of the exhibit placed on the upper surface of the turntable is horizontally spaced from the rotation shaft of the turntable, the load of the exhibit causes a micro-elastic bending deformation of the turntable. Since the turntable is used to display various exhibits for a long period of time, the micro-elastic bending deformation described above may develop into permanent plastic deformation by the fatigue failure principle.

[0012] According to the prior art, the turntable is illuminated by multiple light-emitting elements. In particular, when the turntable is made of a plastic material that is vulnerable to light and thermal energy, light and thermal energy from the light-emitting elements may accelerate plastic deformation due to fatigue failure.

[0013] The use of a plastic material should be pursued because it is advantageous in reducing the weight of the device and reducing the capacity of the motor. However, compared to metal materials, plastic materials are disadvantageous in terms of deformation caused by light, heat, and loads, so manufacturing components, which are continuously subjected to light, heat, and loads, with plastic materials requires a structural design of the device that can prevent deformation from occurring.

[0014] Furthermore, according to the prior art, the rotation shaft of the turntable is configured to be upright by the plurality of bearings, and it is thus difficult for the upper surface of the turntable to be perfectly horizontal.

[0015] For example, according to the prior art, the horizontality of the turntable is maintained by the bearings supporting the rotation shaft of the turntable rotation axis in the rotation axis direction and/or the radial direction. Thus, when the bearings are installed in a way that the bearings are slightly spaced apart or tilted relative to the direction of gravity when manufacturing the turntable-type 3D image lighting device, the upper surface of the turntable may be tilted from the time of manufacturing.

[0016] Accordingly, in the development of a shoe care device having a turntable, it is necessary to consider

whether the turntable can rotate smoothly while the stable state of the turntable is maintained regardless of a point on the upper side of the turntable at which the load of a shoe is applied, and it is necessary to develop a shoe care device in consideration of these aspects.

[Disclosure]

[Technical Problem]

[0017] A task to be achieved by the present invention is to provide a shoe care device capable of continuously maintaining a state in which a turntable stably supports a shoe regardless of the position of the shoe's center of gravity.

[0018] A task to be achieved by the present invention is to provide a shoe care device capable of minimizing the wear and tear of mechanical elements bearing the load of a shoe, even when the shoe is displayed on the upper surface of a turntable for a long period of time.

[0019] A task to be achieved by the present invention is to provide a shoe care device capable of maintaining a constant rotation speed of a turntable while maintaining a smooth rotation of the turntable for a long period of time, even when the center of gravity of a shoe is spaced from the center of the turntable.

[0020] A task to be achieved by the present invention is to provide a shoe care device capable of preventing plastic deformation of a turntable due to fatigue failure, even when the center of gravity of the shoe is spaced from the center of the turntable

[0021] A task to be achieved by the present invention is to provide a shoe care device capable of preventing a turntable being deformed due to light and heat energy of lighting and load of shoes, even when the turntable is made of a plastic material.

[0022] A task to be achieved by the present invention is to provide a shoe care device capable of keeping the upper surface of a turntable perfectly horizontal, even during manufacturing and even when a shoe is displayed for a long period of time.

[Technical Solution]

[0023] A shoe care device described in the present application may include a body, a moving body, and a blowing part.

[0024] The body and the moving body may together form an accommodation space. The accommodation space may accommodate a shoe therein.

[0025] The blowing part may be configured to circulate air in the accommodation space.

[0026] The moving body may include a base, a turntable, and a plurality of rotation balls.

[0027] The base may be slidably coupled to the body so as to open and close the accommodation space.

[0028] The turntable may be coupled to the base so as to rotate about a vertical shaft. The turntable may form a

lower surface of the accommodation space together with the base.

[0029] The rotation balls may be rotatably coupled to the base. The rotation balls may be in point contact with a bottom surface of the turntable and may support a load of the turntable

[0030] The base may include a first base surface and a second base surface.

[0031] The first base surface may be positioned along a circumference of the turntable. The first base surface may form the lower surface of the accommodation space together with an upper surface of the turntable.

[0032] The second base surface may be positioned below the turntable. The rotation balls may protrude above the second base surface.

[0033] The rotation balls may be rotationally symmetrical about the vertical shaft.

[0034] The rotation balls may include a first rotation ball and a second rotation ball.

[0035] A plurality of first rotation ball may are provided. The first rotation balls may be arranged along a circumferential direction at a first distance from the vertical shaft.

[0036] A plurality of second rotation balls may be provided. The second rotation balls may be arranged along a circumferential direction at a second distance from the vertical shaft that is longer than the first distance.

[0037] The number of the first rotation balls may be greater than the number of the second rotation balls.

[0038] The base may have a plurality of receptacles to which the rotation balls are rotatably coupled.

[0039] Each of the receptacles may include an accommodation body and a restraining protrusion.

[0040] The accommodation body may form a hemispherical groove to accommodate at least a lower portion of the rotation ball.

[0041] A plurality of restraining protrusions may be provided. The restraining protrusions may extend upwardly from an edge of the hemispherical groove so as to restrain separation of the rotation ball.

[0042] The diameter of the hemispherical groove may be larger than the diameter of the rotation ball.

[0043] A top of the rotation ball may be higher than a top of the restraining protrusion.

[0044] The restraining protrusion may have a contact surface for restraining the separation of the rotation ball.

[0045] The contact surface may have the same curvature as the inner surface of the hemispherical groove.

[0046] A plurality of through-holes may be formed in the accommodation body so as to reduce friction between the accommodation body and the rotation ball.

[0047] The restraining protrusions and the through-holes may be rotationally symmetrical about the center of the hemispherical groove.

[0048] The through-holes may be positioned below the restraining protrusions.

[0049] The restraining protrusion may have a contact surface that restrains separation of the rotation ball.

[0050] One of the restraining protrusions and another

thereof may be disposed at the same radius as the center of the hemispherical groove around the vertical shaft.

[0051] The body may include a lower body.

[0052] The lower body may be positioned below the accommodation space. The lower body may have a lower body groove having an open front side.

[0053] The moving body may include a motor.

[0054] The motor may be disposed in the lower body groove and coupled to the turntable so as to apply a rotational force.

[Advantageous Effects]

[0055] In the shoe care device according to an embodiment of the present invention, as the rotation ball is in point contact with the accommodation body and the turntable and is rolled by the kinetic energy of the turntable, the frictional resistance between the turntable and the rotation ball may be reduced, thereby reducing the kinetic energy loss of the motor. Therefore, a motor having smaller capacity than an existing motor may be used to rotate the turntable. Thus, the volume and weight of the shoe care device may be reduced by reducing the motor capacity.

[0056] In the shoe care device according to an embodiment of the present invention, the rotating shaft of the motor may be simply inserted into a boss on the bottom surface of the turntable to transmit rotational force, and the rotation balls may support the load of the turntable and a shoe. When the turntable rotates, the rotation balls may be rotated by the kinetic energy of the bottom surface of the turntable and may distribute and support the load of the turntable and the shoe. Therefore, elastic bending deformation of the turntable may be prevented even when the center of gravity of the shoe is spaced horizontally from the turntable rotation shaft. In addition, even when the shoe care device is used for a long period of time, the wear and fatigue failure of the turntable due to the load of the shoe may be minimized, and the upper surface of the turntable may remain flat for a long period of time.

[0057] In the shoe care device according to an embodiment of the present invention, the rotation balls may each be formed in a completely spherical shape. Thus, the height of the rotating rotation balls may be constant at all times with respect to the second base surface. Furthermore, the height of the upper surface of the rotating turntable may be constant at all times with respect to the first base surface. Therefore, the shoe may be rotated at a constant height and the display effect of the shoe may be improved.

[0058] In the shoe care device according to an embodiment of the present invention, a plurality of through-holes may be formed in the accommodation body. The area of the inner surface of the accommodation body, which is in point contact with the rotation ball may be reduced by forming the through-holes. As a result, the friction between the accommodation body and the rota-

tion ball may be reduced, and the kinetic energy loss of the motor can be minimized. Therefore, a motor having a smaller capacity than an existing motor may be used to rotate the turntable. Furthermore, the volume and weight of the shoe care device may be reduced by reducing the capacity of the motor.

[0059] In the shoe care device according to an embodiment of the present invention, elastic deformation of the accommodation body may be facilitated by forming the through-holes. Thus, when a shoe is placed on the turntable, an impact force applied to the turntable may be dissipated by the elastic deformation of the accommodation body. Therefore, the possibility of damage to the turntable and the rotation ball due to the impact force applied to the turntable when the shoe is placed on the turntable may be reduced.

[0060] In the shoe care device according to an embodiment of the present invention, a pair of first restraining protrusions may be positioned in the direction of transmission of kinetic energy applied to the rotation ball from the turntable during reciprocating rotation of the turntable. Thus, the pair of first restraining protrusions may firmly restrain the separation of the rotation ball due to the kinetic energy applied to the rotation ball from the turntable.

[0061] In the shoe care device according to an embodiment of the present invention, one of a pair of second restraining protrusions may be positioned in the direction of transmission of centrifugal force during reciprocating rotation of the turntable. Thus, the pair of second restraining protrusions may restrain the separation of the rotation ball due to the centrifugal force acting on a shoe during rotation of the turntable.

[0062] In the shoe care device according to an embodiment of the present invention, the rotation balls may be rotationally symmetrical about a vertical shaft. Thus, the rotation balls may distribute and support the load of the turntable and a shoe in a rotationally symmetrical form around the vertical shaft. Therefore, the load of the turntable and the shoe may be distributed in a rotationally symmetrical form around the vertical shaft and applied to a table accommodation part. Therefore, elastic bending deformation of the turntable may be prevented even when the center of gravity of the shoe is spaced horizontally from the turntable rotation shaft. Therefore, even when the shoe care device is used for a long period of time, the wear and fatigue failure of the turntable due to the load of shoe may be minimized, and the upper surface of the turntable may remain flat for a long period of time.

[0063] In the shoe care device according to an embodiment of the present invention, as more rotation balls are positioned at a first distance closer than a second distance relative to the rotation shaft of the turntable, the weight of a shoe may be evenly distributed throughout first rotation balls and second rotation balls. Therefore, even when the shoe care device is used for a long period of time, the wear and fatigue failure of the turntable, the rotation balls, and the base due to the load of the shoe

may be minimized, and thus the upper surface of the turntable may remain flat for a long period of time.

[Description of Drawings]

[0064]

FIG. 1a is a perspective view illustrating a shoe care device according to an embodiment of the present invention.

FIG. 1b is a perspective view illustrating a state in which a shoe is stored in an accommodation space of the shoe care device in FIG. 1a.

FIG. 2a is a perspective view illustrating a state in which the accommodation space of the shoe care device in FIG. 1a is opened.

FIG. 2b is a perspective view illustrating a view of the shoe care device in FIG. 2a viewed in another direction.

FIG. 3a is a side view illustrating a use state of the shoe care device in FIG. 1b.

FIG. 3b is a front view illustrating the use state of the shoe care device in FIG. 1b.

FIG. 4 is a perspective view illustrating the bottom surface of a moving body in a shoe care device according to an embodiment of the present invention.

FIG. 5a is a perspective view illustrating a moving body in a shoe care device according to an embodiment of the present invention.

FIG. 5b is an exploded perspective view illustrating a moving body of a shoe care device according to an embodiment of the present invention.

FIG. 5c is a view in which a turntable is separated from the moving body in FIG. 5a.

FIG. 6 is a cross-sectional view illustrating a lower side of a shoe care device according to an embodiment of the present invention.

FIG. 7a is a partially enlarged view illustrating the receptacle and the rotation ball in FIG. 6.

FIG. 7b is a partially enlarged view illustrating a state in which a rotation ball is removed from the receptacle in FIG. 5c.

FIG. 7c is a partial cross-sectional view illustrating a state in which a rotation ball is removed from the receptacle in FIG. 5c.

FIG. 8 is a plan view illustrating a state in which the turntable is removed from the moving body in FIG. 5c.

FIG. 9a is a perspective view illustrating a state in which an accommodation space of the shoe care device in FIG. 1a is open, and illustrates a state in which an information sheet is coupled to a second internal cabinet.

FIG. 9b is a perspective view illustrating a state in which an accommodation space of the shoe care device in FIG. 1a is open, and illustrates a state in which an information sheet is moved through a sec-

ond gap.

FIG. 10a is a perspective view illustrating the front surface of the information sheet in FIG. 9a.

FIG. 10b is a perspective view illustrating the rear surface of the information sheet in FIG. 9a.

FIG. 11 is a perspective view of a shoe care device according to an embodiment of the present invention, viewed from the rear.

FIG. 12 is a perspective view illustrating a state in which a first external cabinet and a second external cabinet are separated from a body of the shoe care device in FIG. 1a.

FIG. 13a is a perspective view illustrating the front surface of a second internal cabinet in FIG. 12.

FIG. 13b is a perspective view illustrating the rear surface of the second internal cabinet in FIG. 12.

FIG. 13c illustrates the rear surface of the second internal cabinet in FIG. 12.

[Modes for the Invention]

[0065] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings. However, in describing the present invention, description of already known features or configurations will be omitted in order to clarify the subject matter of the invention.

[0066] When the shoe is directly exposed to dust, water, heat, and/or sunshine, a fiber material of the shoe may be damaged over time, and a color and a form of the shoe may be changed.

[0067] In order to keep the shoe in an original state (e.g., a state of the shoe at the time of purchase or a state of a clean shoe) for a long time, the shoe should not be exposed much to light and the shoe should be kept at a place that is not too cold or hot. Further, the shoe needs to be kept at a place at which a temperature and a humidity are appropriately maintained.

[0068] Since the shoe made of a leather or suede material is easily colored or has mold, the shoe should be kept in an environment where temperature and humidity are appropriately maintained. A mothball acquired by solidifying pesticides and fragrances have a unique chemical smell that makes it difficult to remove because the smell permeates the shoe when the mothball is kept jointly with the shoe.

[0069] Further, when the shoes are stacked in layers, the form of the shoe may be changed by an applied load.

[0070] Meanwhile, as described above, in recent years, users who collect shoes of popular brands as part of a hobby or financial tech has increased, and the care of the shoe and the display of the shoe has become important needs of users.

[0071] Considering the points, a shoe care device according to an embodiment of the present invention is configured to safely keep the shoe, establish and adjust an environment (e.g., a predetermined range of temperature, humidity, etc.) required for each shoe, and effec-

tively display the shoe, and increase use convenience of the user.

[0072] A first direction X, a second direction Y, and a third direction Z described in the embodiment of the present invention may be directions orthogonal to each other.

[0073] The first direction X and the second direction Y may be directions parallel to a horizontal direction, and the third direction Z may be a direction parallel to a vertical direction. When the first direction X is a direction parallel to the front and rear direction, the second direction Y may be a direction parallel to a left and right direction.

[0074] In describing embodiments of the present invention, except for a case which is particularly differently limited, the first direction X, the second direction Y, and the third direction Z may be appreciated as a front direction, a left direction, and an upper direction, respectively.

[0075] FIG. 1a is a perspective view illustrating a shoe care device 1 according to an embodiment of the present invention. FIG. 1a illustrates a state in which an internal space (hereinafter, referred to as 'accommodation space 10') of the shoe care device 1 is closed. FIG. 1b is a perspective view illustrating a state in which a shoe S is stored in the accommodation space 10 of the shoe care device 1 in FIG. 1a.

[0076] FIG. 2a is a perspective view illustrating a state in which the accommodation space 10 of the shoe care device 1 in FIG. 1a is opened. FIG. 2b is a perspective view illustrating a view of the shoe care device in FIG. 2a viewed in another direction.

[0077] As illustrated in FIGS. 1a and 1b, the shoe care device 1 according to the embodiment is configured to include a body 100 and a moving body 200.

[0078] The body 100 and the moving body 200 form the accommodation space 10 accommodating the shoe S jointly. The body 100 and the moving body 200 are coupled to move with respect to each other. The moving body 200 may be coupled to the body 100 to reciprocally move in a horizontal direction.

[0079] The shoe care device 1 illustrated in FIG. 1a may be changed like the shoe care device 1 illustrated in FIG. 2a. That is, the moving body 200 may slidably move in a first direction X with respect to the body 100, and the shoe care device 1 is transformed from the closed state to the opened state, and the accommodation space 10 may be opened.

[0080] The shoe care device 1 illustrated in FIG. 2a may be changed like the shoe care device 1 illustrated in FIG. 1a again. That is, the moving body 200 may slidably move in an opposite direction to the first direction X with respect to the body 100, and the shoe care device 1 is transformed from the opened state to the closed state, and the accommodation space 10 may be closed.

[0081] As such, in the shoe care device 1 according to the embodiment of the present invention, the moving body 200 may move the first direction X or the opposite direction to the first direction X with respect to the body 100, and reciprocally move in front and rear directions.

[0082] In the state in which the accommodation space 10 is closed, the accommodation space 10 may be sealed from outside air. Therefore, when the shoe S is accommodated in the accommodation space 10 and the accommodation space 10 is closed, a contact of the shoe S with dust and moisture of the outside air may be interrupted.

[0083] The body 100 may form an upper surface and a rear surface of the accommodation space 10.

[0084] The moving body 200 may form a front surface, a lower surface, and both side surfaces of the accommodation space 10.

[0085] The accommodation space 10 may be formed in a hexahedral form. However, the accommodation space 10 of the shoe care device 1 according to the embodiment of the present invention is not limited to such a shape, and may be configured in various three-dimensional shapes.

[0086] The body 100 and the moving body 200 may form an overall appearance of the shoe care device 1. An exterior of the shoe care device 1 may be configured in the hexahedral form. That is, in the state in which the body 100 and the moving body 200 are coupled to each other and the accommodation space 10 is closed, the external appearance of the shoe care device 1 may be configured in the hexahedral form. However, the shoe care device 1 according to the embodiment of the present invention is not limited to such a shape, and may be configured in various three-dimensional shapes.

[0087] The body 100 may include an upper body 130, a middle body 120, and a lower body 110.

[0088] The upper body 130 is positioned at an upper side of the accommodation space 10. The upper body 130 forms the upper surface of the accommodation space 10. The upper body 130 may form an uppermost portion of the shoe care device 1. The upper surface of the upper body 130 may form a flat surface along a substantially horizontal surface. When a plurality of shoe care devices 1 is provided, any one shoe care device 1 may be placed on the upper surface of the upper body 130 of the other one shoe care device 1, and the shoe care devices 1 may be stacked on each other.

[0089] The lower body 110 is positioned below the accommodation space 10. The lower body 110 may form a lowermost portion of the shoe care device 1. The lower body 110 may form a bottom portion of the shoe care device 1.

[0090] The middle body 120 is positioned behind the accommodation space 10. The middle body 120 forms the rear surface of the accommodation space 10. The middle body 120 may connect the upper body 130 and the lower body 110 behind the accommodation space 10. The middle body 120 may form a rear wall surface of the shoe care device 1.

[0091] The body 100 is configured to include the upper body 130, the middle body 120, and the lower body 110, and as a result, the body 100 may form a substantially 'C' form on the side view.

[0092] As described above, the moving body 200 is configured to move forward and backward with respect to the body 100. The moving body 200 may include a base 220, a transparent window 210, and a turntable 230.

[0093] The base 220 may be coupled to the lower body 110 to be slidably movable in the first direction X. The base 220 may form the bottom portion of the moving body 200. The base 220 may be positioned at the upper side of the lower body 110. A bottom surface of the base 220 may be positioned in close contact with or in proximity to the upper surface of the lower body 110.

[0094] The transparent window 210 may form of extending upward from the base 220. The transparent window 210 may form the front surface, and both side surfaces (a left surface and a right surface) of the accommodation space 10. The transparent window 210 may be made of a transparent or translucent material.

[0095] Light inside and outside the accommodation space 10 may pass through the transparent window 210. The transparent window 210 may be made of a material which is weather-resistant to prevent discoloration. The transparent window 210 may be made of an acrylic (PMMA) material which is weather-resistant and scratch-resistant.

[0096] The transparent window 210 may prevent a beam having a predetermined wavelength from being introduced into the accommodation space 10. As an example, the transparent window 210 may be configured to block ultraviolet rays. The ultraviolet rays as an electromagnetic wave in which a wavelength corresponds to 10 to 397 nm shorter than visible rays are light which has a strong chemical action and causes getting sunburn or discoloration.

[0097] As an example, an ultraviolet-proof film may be attached to an inner surface or an outer surface of the transparent window 210. Alternatively, the inner surface or the outer surface of the transparent window 210 may be UV-coated with an ultraviolet-proof agent.

[0098] The transparent window 210 includes a first window 211, a second window 212, and a third window 213. The first window 211 may form the front surface of the accommodation space 10. The second window 212 may form the left surface of the accommodation space 10. The third window 213 may form the right surface of the accommodation space 10.

[0099] In the state in which the shoe S is accommodated in the accommodation space 10, a user may view the shoe S through the transparent window 210. As a result, the shoe care device 1 may be used as a device which may display the shoe S while keeping and caring the shoe S.

[0100] As illustrated in FIGS. 1a and 1b, in the state in which the moving body 200 is positioned relatively at a rearmost side, the accommodation space 10 may be sealed from the outside air. In this case, the accommodation space 10 may be formed in the hexahedral form. In this case, the moving body 200 may be present at a first location and the shoe care device 1 is in the closed state.

[0101] As illustrated in FIGS. 2a and 2b, in the state in which the moving body 200 moves in the first direction X, the accommodation space 10 may be opened. In this case, an upper portion of the first window 211 is spaced to a front side in the first direction X from the front surface of the upper body 130 to form a gap (hereinafter, referred to as 'first gap').

[0102] In this case, an upper portion of the first window 212 is spaced to a front side in the first direction X from the front surface of the upper body 120 to form a gap (hereinafter, referred to as 'first gap'). The third window 213 is spaced to the front side in the first direction X from a right side surface of the middle body 120 to form a gap (hereinafter, referred to as 'third gap').

[0103] In the state in which the moving body 200 moves in the first direction X as much as possible, i.e., in the state in which the moving body 200 is positioned relatively at a frontmost side, the moving body 200 may be present at a second location and the shoe care device 1 may be in the opened state.

[0104] The user may put the shoe S into the accommodation space 10 or withdraw the shoe S from the accommodation space 10 through the first gap. The user may put the shoe S into the accommodation space 10 or withdraw the shoe S from the accommodation space 10 through the first gap. An internal panel 500 may be coupled to the inner surface of the middle body 120 or uncoupled from the inner surface of the middle body 120.

[0105] The turntable 230 may form the upper surface on which the shoe S is placed. The upper surface of the turntable 230 may have a circular shape. The turntable 220 may form the lower surface of the accommodation space 10 jointly with the base 220.

[0106] The turntable 230 may be rotatably coupled to the base 220 around a vertical axis, i.e., an axis parallel to a third direction Z.

[0107] For the rotation of the turntable 230, a motor 290 may be provided in the moving body 200. The motor 290 may be coupled to the base 220. The turntable 230 may rotate in conjunction with the rotation of the motor 290. Rotational force of the motor 290 may be delivered to the turntable 230 through a reducer. The motor 290 may rotate unidirectionally or reciprocally rotate bidirectionally.

[0108] The turntable 230 is provided, and as a result, the shoe S may rotate in the accommodation space 10 or a display effect of the shoe S may be enhanced.

[0109] The shoe care device 1 may include an operating button 610 and a controller 600. The operating button 610 may be formed in the body 100. As an example, the operating button 610 may be formed on the front surface of the upper body 130.

[0110] When the user manipulates the operating button 610, the turntable 230 may rotate or stop. The user manipulates the operating button 610 to adjust a rotational speed of the turntable 230. The user may input a rotation time of the turntable 230 into the controller 600 through the operating button 610.

[0111] The user manipulates the operating button 610 to rotate the turntable 230 at a predetermined angle. In the state in which the accommodation space 10 is opened, the user may place the shoe S on the upper surface of the turntable 230 by holding any one part (heel top, lining, tongue, etc.) of the shoe S. Thereafter, the user manipulates the operating button 610 to rotate the turntable 230 at a predetermined angle.

[0112] As an example, the user manipulates the operating button 610 to rotate the turntable 230 at a predetermined angle so that a front and rear direction of the shoe S coincides with the first direction X. Alternatively, the user manipulates the operating button 610 to rotate the turntable 230 at a predetermined angle so that the front and rear direction of the shoe S form a predetermined angle with the first direction X.

[0113] Therefore, even though the user places the shoe S on the upper surface of the turntable 230 while gripping any one part of the shoe S, the shoe S may be placed (displaced) in a direction desired by the user.

[0114] A sensor (not illustrated) that senses movement of the moving body 200 may be provided in the body 100. When the accommodation space 10 is closed, the controller 600 may rotate the turntable 230 by a signal of the sensor.

[0115] A load sensor (not illustrated) may be provided in the base 220. The load sensor may automatically measure a load of the shoe S placed on the turntable 230. The rotational speed of the turntable 230 according to a measurement value of the load sensor may be set in the controller 600. Alternatively, the user may input the rotational speed of the turntable 230 according to the measurement value of the load sensor into the controller 600 through the operating button 610.

[0116] A camera (not illustrated) may be provided in the shoe care device 1. The camera may automatically shoot the shoe S placed on the turntable 230. The controller 600 may recognize the shape, size, and/or type of the shoe S through a shooting image of the camera.

[0117] The rotational speed of the turntable 230 according to the shape, size, and/or type of the shoe S may be set in the controller 600. Alternatively, the user may input the rotational speed of the turntable 230 according to the shape, size, and/or type of the shoe S into the controller 600 through the operating button 610.

[0118] The shoe care device 1 may include an operating sensor. The operating sensor may sense an access of the user. The turntable 230 may be rotated or stopped by the sensing signal of the operating sensor.

[0119] FIG. 3a is a side view illustrating a use state of the shoe care device 1 in FIG. 1b. FIG. 3a illustrates a state of illuminating the shoe S in the accommodation space 10.

[0120] FIG. 3b is a front view illustrating the use state of the shoe care device 1 in FIG. 1b. FIG. 3b illustrates an air flow in the accommodation space 10.

[0121] The shoe care device 1 according to the embodiment of the present invention may include a first light

410. The first light 410 may be provided in the upper body 130.

[0122] As illustrated in FIG. 3a, the first light 410 may illuminate the accommodation space 10. The first light 410 may include a light source 411 and a lens 414.

[0123] The light source 411 may intensively irradiate light onto the upper surface of the turntable 230 on which the shoe S is placed. The light of the light source 411 may intensively illuminate the shoe S placed on the upper surface of the turntable 230. When the light 410 is turned, an image of the shoe S stored in the accommodation space 10 may be changed by the light of the light source 411.

[0124] The light of the light source 411 may illuminate the accommodation space 10 by passing through the lens 414. An ultraviolet-proof film may be attached to the lens 414 or the ultraviolet-proof agent may be coated on the lens 414 in order to block the ultraviolet rays.

[0125] When the user manipulates the operating button 610, the light source 411 may be turned on or off. The user may input an operating time of the light source 411 into the controller 600 through the operating button 610. The user manipulates the operating button 610 to adjust the operating time of the light source 411.

[0126] Alternatively, the light source 411 may be turned on or off by the sensing signal of the operating sensor. The controller 600 may turn on-off the light source by the signal of the operating sensor.

[0127] Alternatively, the light source 411 may be turned on or off by the sensing signal of the sensor. When the accommodation space 10 is closed, the controller 600 may turn on-off the light source by the signal of the sensor.

[0128] Alternatively, the operating time and the operating pattern of the light source according to the measurement value of the load sensor may be set in the controller 600. The user may input the operating time and the operating pattern of the light source 411 according to the measurement value of the load sensor into the controller 600 through the operating button 610.

[0129] Alternatively, the operating time and the operating pattern of the light source according to the shape, size, and/or type of the shoe S may be set in the controller 600. The user may input the operating time and the operating pattern of the light source 411 according to the shape, size, and/or type of the shoe S into the controller 600 through the operating button 610.

[0130] The light source 411 may be configured to change the color of the light. As an example, the light source 411 may be constituted by Red Green Blue White (RGBW) LEDs. The controller 600 may control current applied to a Red (R) LED, a Green (G) LED, a Blue (B) LED, and a White (W) LED. When the controller 600 controls the current applied to the RGBW LEDs, the aesthetics and a color sense of the shoe S stored in the accommodation space 10 may be variously changed. The user may input a pattern of the current applied to the RGBW LED into the controller 600 through the operating

button 610.

[0131] FIG. 4 is a perspective view illustrating the bottom surface of a moving body 200 in a shoe care device 1 according to an embodiment of the present invention. FIG. 5a is a perspective view illustrating the moving body 200 of the shoe care device 1 according to an embodiment of the present invention.

[0132] The body 100 may include a lower body 110 which is positioned below the accommodation space 10 and has a lower body groove 119 having an open front side (see FIG. 2b)

[0133] The moving body 200 may include a base 220 slidably coupled to the lower body 110, a turntable 230 coupled to the base 220 so as to rotate about a vertical shaft 231 and forming the lower surface of an accommodation space 10 together with the base 220, and a motor 290 disposed in the lower body groove 119 and coupled to the turntable 230 so as to apply a rotational force to the turntable 230.

[0134] The extension of the vertical shaft 231 may be parallel to a first direction X, which is a horizontal direction, and may be positioned within a reference plane RP, which is a vertical plane.

[0135] In other words, the lower body groove 119, which is concave downwardly and has an open front side, may be formed in the center portion of the lower body 110 so as to prevent interference with the body 100 during the sliding of the moving body 200.

[0136] In particular, in order to rotate the turntable 230 coupled to the base 220 of the moving body 200, the motor 290 also needs to be coupled to the base 220, and it may be preferable to dispose the motor 290 below the base 220 for appearance.

[0137] Therefore, when disposing the motor 290 below the base 220, it may be more preferable to dispose the motor 290 in the lower body groove 119 so that the motor 290 does not interfere with the body 100 when the moving body 200 slides.

[0138] Thus, in the shoe care device 1 according to the present embodiment, the motor 290, which applies a rotational force to the turntable 230, is disposed in the lower body groove 119 formed in the lower body 110, so that the motor 290 may be prevented from interfering with the body 100 during the sliding of the moving body 200.

[0139] The shoe care device 1 according to an embodiment of the present invention may further include a power supply disposed in a portion of the lower body 110 other than the lower body groove 119 so as to supply power to the motor 290, and a cable electrically connecting the power supply to the motor 290.

[0140] FIG. 5b is an exploded perspective view illustrating the moving body 200 of the shoe care device 1 according to an embodiment of the present invention. FIG. 5c is a view in which the turntable 230 is separated from the moving body 200 in FIG. 5a.

[0141] The moving body 200 forms the accommodation space 10 jointly with the body 100. The moving body 200 may be movably coupled to the body 100 between a

first location and a second location. The second location is a location before the first location. The moving body 200 may be coupled to the body 100 to be movable forward and backward with respect to the body 100.

[0142] When the moving body 200 is at the first location, the accommodation space 10 is closed and when the moving body 200 is at the second location, the accommodation space 10 is opened.

[0143] When the moving body 200 is at the second location, the accommodation space 10 of the shoe care device 1 is opened at the upper side, the left side, and the right side.

[0144] When the moving body 200 moves forward and backward with respect to the body 100, the moving body 200 may be supported by the lower body 110 and the upper body 130.

[0145] When the moving body 200 is at the first location, both left and right sides at the upper side and both left and right sides at the lower side of the moving body 200 are supported by the body 100. When the moving body 200 is at the second location, both left and right sides at the upper side and both left and right sides at the lower side of the moving body 200 may be supported by the body 100.

[0146] In the embodiment of the present invention, the transparent window 210 may be integrally configured. That is, respective parts constituting the transparent window 210 is not configured to be connected or fixed to each other by a fixation means (e.g., a bracket, a clip, a bolt, an adhesive, etc.), but the transparent window 210 may be configured as one body from the time of manufacturing. All parts constituting the transparent window 210 may be made of the same material. All parts constituting the transparent window 210 may be configured to have the same made of the same physical property.

[0147] In the shoe care device 1 according to the embodiment of the present invention, the transparent window 210 may be formed by injection molding.

[0148] A substantial part of the transparent window 210 or all parts of the transparent window 210 may be configured to be transparent.

[0149] The transparent window 210 may be configured by a combination of plates constituting planes which are distinguished from each other. The plates constituting the transparent window 210 are connected to each other. The plates constituting the transparent window 210 are connected to each other at respective corners. A part where the plates are connected in the transparent window 210 may form a bent form, a curved surface, or a flat surface.

[0150] The transparent window 210 may be made of polymethyl methacrylate (PMMA).

[0151] The transparent window 210 includes a first window 211, a second window 212, and a third window 213. Each of the first window 211, the second window 212, and the third window 213 is configured to be transparent. Each of the first window 211, the second window 212, and the third window 213 may be configured in a flat

plate form. Each of the first window 211, the second window 212, and the third window 213 may be configured in a square plate form. Vertical heights of the respective windows of the first window 211, the second window 212, and the third window 213 may be the same as or similar to each other.

[0152] The first window 211 forms the front surface of the shoe care device 1, the second window 212 forms the left surface of the shoe care device 1, and the third window 213 forms the right surface of the shoe care device 1. The second window 212 extends to a rear side from a left end of the first window 211, and the third window 213 extends to the rear side from a right end.

[0153] The first window 211 forms the front surface of the transparent window 210, the second window 212 forms the left surface of the transparent window 210, and the third window 213 forms the right surface of the transparent window 210. An inner surface and an outer surface of the first window 211 may form surfaces orthogonal to the first direction. The inner surface and the outer surface of the second window 212 may form surfaces orthogonal to the second direction. The inner surface and the outer surface of the third window 213 may form surfaces orthogonal to the second direction.

[0154] The inner surface of the first window 211 forms the front surface of the accommodation space 10. The inner surface of the second window 212 forms the left surface of the accommodation space 10. The inner surface of the third window 213 forms the right surface of the accommodation space 10.

[0155] The transparent window 210 includes the first window 211, the second window 212, and the third window 213, and as a result, the transparent window 210 may be configured in a substantially C shape (or $\subset$ shape, $\sqcap$ shape, or $\sqcup$ shape) on a plan view.

[0156] The transparent window 210 may be configured in a symmetric form around the reference plane RP. The second window 212 and the third window 213 may be configured symmetric to each other around the reference plane RP.

[0157] In the shoe care device 1, the upper body 130 and the first window 211 may be opened/closed to each other, the middle body 120 and the second window 212 may be opened/closed to each other, and the middle body 120 and the third window 213 may be opened/closed to each other.

[0158] The lower side of the second window 212 and the lower side of the third window 213 may be supported on the lower body 110.

[0159] The upper side of the second window 212 and the upper side of the third window 213 may be supported on the upper body 130.

[0160] In the shoe care device 1 according to the embodiment of the present invention, the transparent window 210 may be integrally formed. In addition, the transparent window 210 may form an area of substantial parts of the front surface, the left surface, and the right surface of the shoe care device 1.

[0161] An area of the first window 211 may be configured to correspond to the area of the front surface of the accommodation space 10. The area of the second window 212 may be configured to correspond to the area of the left surface of the accommodation space 10. The area of the third window 213 may be configured to correspond to the area of the right surface of the accommodation space 10.

[0162] According to the embodiment of the present invention, the area of the transparent window 210 may be maximized, the shoe S accommodated in the accommodation space 10 may not be blocked, but well viewed at all of the front side, the left side, and the right side, and the display effect of the shoe may be increased.

[0163] Unlike the embodiment of the present invention, when the transparent window 210 is formed only on the front surface of the shoe care device 1, the shoe S may not be viewed at the left side or the right side of the shoe care device 1, and the display effect of the shoe may not be sufficiently shown.

[0164] Unlike the embodiment of the present invention, if the first window 211 and the second window 212 are not integrally configured (further, if the first window 211 and the third window 213 are not integrally configured), a boundary between the first window 211 and the second window 212 (further, a boundary between the first window 211 and the third window 213) is viewed to the user, and the boundary may visually block the shoe inside the accommodation space 10 and the display effect of the shoe may be reduced, and the satisfaction of the user may be lowered. Further, a gap may be generated between the boundaries, and foreign substances may be introduced into the accommodation space 10 through the gap.

[0165] The transparent window 210 includes a first curved surface portion 214 and a second curved surface portion 215. Each of the first curved surface portion 214 and the second curved surface portion 215 forms a vertical corner portion of the transparent window 210.

[0166] The first curved surface portion 214 is a portion connecting the first window 211 and the second window 212. A cross section of the first curved surface portion 214 may be constantly configured in an upper and lower direction (or third direction). The first curved surface portion 214 is configured in a curved surface structure. Each of the outer surface and the inner surface of the first curved surface portion 214 is configured in a curved surface form which is convex to the outside of the transparent window 210.

[0167] The first window 211 and the first curved surface portion 214 may be configured so that a curvature radius is continuously changed. Further, the second window 212 and the first curved surface portion 214 may be configured so that the curvature radius is continuously changed. That is, on an inner surface and an outer surface of a portion connected from the first window 211 to the first curved surface portion 214 and the second window 212, the curvature radius may not be discontinu-

ously changed, but a bent surface may not be formed.

[0168] When the inner surfaces and the outer surfaces of the first window 211 and the second window 212 are configured by planes in the transparent window 210, and the transparent window 210 is configured to include the first curved surface portion 214, the curvature radii of the inner surface and the outer surface of the first curved surface portion 214 may be configured as 1 to 50 mm.

[0169] The transparent window 210 is configured to include the first curved surface portion 214, and as a result, the shoe S inside the accommodation space 10 may not be visually blocked through the first curved surface portion 214, but fully viewed to the user.

[0170] Further, the first curved surface portion 214 is configured as described above, and as a result, the shoe S inside the accommodation space 10 viewed through the first curved surface portion 214, a portion where the first curved surface portion 214 and the first window 211 are connected, and a portion where the first curved surface portion 214 and the second window 212 are connected may be prevented or minimized from being distorted.

[0171] The second curved surface portion 215 is a portion connecting the first window 211 and the third window 213. The cross section of the second curved surface portion 215 may be constantly configured in the upper and lower direction (or third direction). The second curved surface portion 215 is configured in the curved surface structure. Each of the outer surface and the inner surface of the second curved surface portion 215 is configured in the curved surface form which is convex to the outside of the transparent window 210.

[0172] The first window 211 and the second curved surface portion 215 may be configured so that the curvature radius is continuously changed. Further, the third window 213 and the second curved surface portion 215 may be configured so that the curvature radius is continuously changed. That is, on the inner surface and the outer surface of a portion connected from the first window 211 to the second curved surface portion 215 and the third window 213, the curvature radius may not be discontinuously changed, but the bent surface may not be formed.

[0173] When the inner surfaces and the outer surfaces of the first window 211 and the third window 213 are configured by the planes in the transparent window 210, and the transparent window 210 is configured to include the second curved surface portion 215, the curvature radii of the inner surface and the outer surface of the first curved surface portion 214 may be configured as 1 to 50 mm.

[0174] The transparent window 210 is configured to include the second curved surface portion 215, and as a result, the shoe S inside the accommodation space 10 may not be visually blocked through the second curved surface portion 215, but fully viewed to the user.

[0175] Further, the second curved surface portion 215 is configured as described above, and as a result, the

shoe S inside the accommodation space 10 viewed through the second curved surface portion 215, a portion where the second curved surface portion 215 and the first window 211 are connected, and a portion where the second curved surface portion 215 and the third window 213 are connected may be prevented or minimized from being distorted.

[0176] As described above, according to an embodiment of the present invention, any gap is not formed at a connection portion of the first window 211 and the second window 212 and a connection portion of the first window 211 and the third window 213, and the aesthetics at the portions are excellent, and foreign substances such as dust can be prevented from being inserted into the accommodation space 10 through the portions. Further, the shoe S is not visually blocked, but the shoe S is viewed even through the connection portion of the first window 211 and the second window 212, and the connection portion of the first window 211 and the third window 213. Further, the air in the accommodation space 10 may be controlled, and the shoe S may be fully exposed at the front side, the left side, and the right side of the shoe care device 1, and both the management of the shoe and the display of the shoe may be effectively achieved.

[0177] Further, by the shoe care device 1 according to the embodiment of the present invention, even though a plurality of shoe care devices 1 are stacked vertically or arranged horizontally, each shoe care device 1 may be smoothly operated, and each shoe S accommodated in each shoe care device 1 may be visually exposed.

[0178] The transparent window 210 integrally configured in the shoe care device 1 according to the embodiment of the present invention is made of polymethyl methacrylate (PMMA), and includes the first curve portion 214 and the second curve portion 215. As a result, the aesthetic of the transparent window 210 itself may be excellent, and the shoe care device 1 may be easily assembled. Further, discoloration of the transparent window 210 may be prevented, and a solid transparent window 210 may be formed. Further, when the shoe S accommodated in the shoe care device 1 is viewed to an external user through the transparent window 210, the entire shape of the shoe is not divided, but integrally viewed, and distortion is prevented.

[0179] The base 220 is fixedly coupled to the lower side of the transparent window 210 to form a lower portion of the moving body 200. An entire form of the base 220 may be configured as a flat form in the horizontal direction. The base 220 may be configured in the square form on the plan view.

[0180] The base 220 may be configured so that the shoe S is placed at the upper side of the base 220. An upper surface 220a of the base 220 may be configured substantially in the square form.

[0181] The upper surface 220a of the base 220 may be positioned along the circumference of the turntable 230 in the accommodation space 10. The top surface 220a of the base 220 may form the lower surface of the accom-

modation space 10 together with the upper surface of the turntable 230. The top surface 220a of the base 220 positioned along the circumference of the turntable 230 in the accommodation space 10 will be referred to as the first base surface 220a.

[0182] The base 220 is positioned at the upper side of the lower body 110. The upper surface 220a of the base 220 is positioned at the upper side of the lower body 110. The base 220 is coupled to the lower body 110 to be movable forward and backward.

[0183] The moving body 200 may be configured to include the turntable 230. The turntable 230 is rotatably coupled around a perpendicular rotational axis 231 at the upper side of the base 220. The turntable 230 is configured in a circular plate form. The upper surface of the turntable 230 may be configured to be in parallel to the first direction X and the second direction Y.

[0184] The perpendicular rotational axis 231 may refer to the rotation shaft 231 of the motor 290. A boss into which the rotation shaft 231 of the motor 290 is inserted may be formed on the bottom surface of the turntable 230. To transmit a rotational force from the motor 290 to the turntable 230, the rotation shaft 231 of the motor 290 and the boss may be coupled to each other by a key. Keyways may be formed in the rotation shaft 231 of the motor 290 and the boss. Alternatively, to transmit a rotational force from the motor 290 to the turntable 230, the rotation shaft 231 of the motor 290 and the boss may form an asymmetrical shape relative to the center of the rotation shaft 231.

[0185] The base 220 may have a table accommodation part 221 in which the turntable 230 is accommodated. The table accommodation part 221 may be formed in a concave shape at a center portion of the upper surface 220a of the base 220.

[0186] Accordingly, the height of the upper surface 221a (hereinafter, referred to as the "second base surface") of the table accommodation part 221 is configured to be slightly lower than the height of the upper surface 220a of the base 220 excluding the table accommodation part 221.

[0187] In a plan view, the table accommodation part 221 may be formed in a circular shape about the perpendicular rotational axis 231. Thus, the second base surface 221a may be circular. The shape and size of the table accommodation part 221 is configured to correspond to the shape and size of the turntable 230.

[0188] The upper surface 220a of the base 220, excluding the table accommodation part 221, may be formed to have a height which corresponds to or match that of the upper surface of the turntable 230 while the turntable 230 is coupled to the base 220. The second base surface 221a may be positioned below the turntable 230.

[0189] While the transparent window 210 and the base 220 move forward with respect to the body 100, the shoe may be seated on the base 220 or the shoe may be withdrawn from the base 220 through the space between

the upper body 130 and the first window 211.

[0190] Further, in this case, the user may access the shoe or an upper space through the space between the middle body 120 and the second window 212 or between the middle body 120 and the third window 213. Further, in this case, the user easily accesses the inner surface of each of the lower body 110, the middle body 120, and the upper body 130 (see FIGS. 2a and 2b).

[0191] According to the embodiment of the present invention, it is convenient to withdraw and insert the shoe from and into the shoe care device 1, and positioning the shoe is convenient.

[0192] As described above, the moving body 200 is configured to include the turntable 230 in the shoe care device 1 according to the embodiment of the present invention. Therefore, a shoe care device 1 may be provided in which both circulation of the air and rotation of the shoe are conducted in the accommodation space 10, and as a result, both the management of the shoe and the display effect of the shoe are excellent.

[0193] The moving body 200 may be configured to include a lower guard 240. The lower guard 240 is fixedly coupled to an outer side of a border of the base 220. The lower guard 240 is fixedly coupled to a front surface 220b, a left surface 220c, and a right surface 220d of the base 220 (see FIG. 7a).

[0194] The lower guard 240 may be configured substantially in the C shape (or $\subset$ shape, Π shape, or $\sqcap$ shape) on the plan view. On the plan view, the shape of the lower guard 240 may be configured to correspond to the shape of the transparent window 210.

[0195] The lower guard 240 may be positioned outside the lower body 110.

[0196] The lower guard 240 is configured to include a first lower guard 240a, a second lower guard 240b, and a third lower guard 240c. The lower guard 240 may be integrally configured.

[0197] The first lower guard 240a forms the front surface of the lower guard 240. The outer surface and the inner surface of the first lower guard 240a may be configured to be orthogonal to the first direction X. The second lower guard 240b forms the left surface of the lower guard 240. The outer surface and the inner surface of the second lower guard 240b may be configured to be orthogonal to the second direction Y. The third lower guard 240c forms the right surface of the lower guard 240. The outer surface and the inner surface of the third lower guard 240c may be configured to be orthogonal to the second direction Y.

[0198] The first lower guard 240a may be positioned at the front side of a front end of the lower body 110. The second lower guard 240b may be positioned at the left side of a left end of the lower body 110. The third lower guard 240c may be positioned at the right side of a right end of the lower body 110.

[0199] In the shoe care device 1 according to the embodiment of the present invention, the lower side of the transparent window 210 may be fixedly interposed

between the base 220 and the lower guard 240.

[0200] The transparent window 210 may be configured to include a concealment portion 216.

[0201] The concealment portion 216 extends to the lower side from the first window 211, the second window 212, and the third window 213. The concealment portion 216 may be divided into a first concealment portion 216a, a second concealment portion 216b, and a third concealment portion 216c. The first concealment portion 216a extends to the lower side from a lower end of the first window 211. The second concealment portion 216b extends to the lower side from the lower end of the second window 212. The third concealment portion 216c extends to the lower side from the lower end of the third window 213.

[0202] The front surface 220b, the left surface 220c, and the right surface 220d of the base 220 are in close contact with the inner surface of the concealment portion 216.

[0203] The inner surface of the lower guard 240 is in close contact with the outer surface of the concealment portion 216, and fixed to the base 220.

[0204] The transparent window 210 may be configured to include a plurality of first through holes 217.

[0205] The first through hole 217 is configured in a hole form penetrating the transparent window 210 at the lower side of each of the first window 211, the second window 212, and the third window 213.

[0206] The first through hole 217 may be arranged in the horizontal direction. The first through hole 217 formed at the lower side of the first window 211 is arranged in the second direction Y. The first through hole 217 formed at the lower side of the second window 212 is arranged in the first direction X, and the first through hole 217 formed at the lower side of the third window 213 is also arranged in the first direction X.

[0207] The first through hole 217 may be formed in the concealment portion 216. That is, the first through hole 217 may be configured in the hole form penetrating the concealment portion 216. The first through hole 217 may be formed in each of the first concealment portion 216a, the second concealment portion 216b, and the third concealment portion 216c.

[0208] The base 220 may be configured to include a plurality of second through holes 223. The second through hole 223 is formed on each of the front surface 220b, the left surface 220c, and the right surface 220d of the base 220.

[0209] The second through hole 223 formed on the front surface 220b of the base 220 is arranged in the second direction Y. The second through hole 223 formed on the left surface 220c of the base 220 is arranged in the first direction X, and the second through hole 223 formed on the right surface 220d of the base 220 is also arranged in the first direction X.

[0210] The second through-hole 223 may be formed at a location corresponding to the first through hole 217.

[0211] The lower guard 240 may be configured to in-

clude a plurality of hooks 242. The hook 242 protrudes inward on the inner surface of the lower guard 240. The hook 242 protrudes in an inner direction on the inner surface of each of the first lower guard 240a, the second lower guard 240b, and the third lower guard 240c.

[0212] The hook 242 is configured to be inserted and hooked into the second through hole 223 by passing through the first through hole 217.

[0213] The hook 242 may be configured to include a first hook 242a and a second hook 242b. A hooking location of the first hook 242a and a hooking location of the second hook 242b may be configured to be opposite to each other.

[0214] For example, when the first hook 242a is hooked to the upper side of the second through hole 223, the second hook 242b may be hooked to the lower side of the second through hole 223. Alternatively, when the first hook 242a is hooked to the lower side of the second through hole 223, the second hook 242b may be hooked to the upper side of the second through hole 223 (see FIGS. 9a and 9b).

[0215] The first hook 242a and the second hook 242b may be arranged repeatedly with each other in the horizontal direction.

[0216] A seating rib 222 supporting the lower end of the transparent window 210 may be formed in the base 220. The seating rib 222 may protrude outward on the border of the base 220. The seating rib 222 may protrude outward on the front surface 220b, the left surface 220c, and the right surface 220d of the base 220.

[0217] The hooking jaw 224 may be formed in the base 220. The hooking jaw 224 protrudes outward on a lower border of the entire or a partial second through hole 223. The hooking jaw 224 formed on the front surface 220b of the base 220 protrudes to the front side, the hooking jaw 224 formed on the left surface 220c of the base 220 protrudes to the left side, and the hooking jaw 224 formed on the right surface 220d of the base 220 protrudes to the right side.

[0218] While the base 220 and the transparent window 210 are assembled, the lower end of the transparent window 210 (the lower end of the concealment portion 216) is seated on the upper surface of the seating rib 222, and the hooking jaw 224 of the base 220 is inserted into the first through hole 217 and hooked to the lower side of the first through hole 217. In this case, the hook 242 (in particular, the first hook 242a) is positioned at the upper side of the hooking jaw 224. As a result, the base 220 and the transparent window 210 may be more stably coupled (see FIG. 9b).

[0219] As described above, in the shoe care device 1 according to the embodiment of the present invention, the base 220 forms a bottom part of the moving body 200. The front surface 220b, the left surface 220c, and the right surface 220d of the base 220 are in close contact with the inner surface of the concealment portion 216 of the transparent window 210, the inner surface of the lower guard 240 is in close contact with the outer surface of the

concealment portion 216, and the lower guard 240 is fixed to the base 220.

[0220] The lower side of the transparent window 210 is fixed by the base 220 and the lower guard 240 to form a rigid coupling structure of the moving body 200. Further, an area of a transparent part (transparent window 210) in the moving body 200 may be maximally secured.

[0221] As described above, the hook 242 of the lower guard 240 is configured to be inserted and hooked into the second through hole 223 of the base 220 by passing through the first through hole 217 of the transparent window 210. In addition, a hooking location of the first hook 242a and a hooking location of the second hook 242b may be configured to be opposite to each other.

[0222] As a result, while the coupling portion (concealment portion 216) of the transparent window 210 is not externally visually exposed, the transparent window 210, the base 220, and the lower guard 240 may be stably coupled.

[0223] The outer surface of the concealment portion 216 is stepped to be dented on the outer surfaces of the first window 211, the second window 212, and the third window 213. The outer surface of the first concealment portion 216a may be configured to be dented inward on the outer surface of the first window 211, the outer surface of the second concealment portion 216b may be configured to be dented inward on the outer surface of the second window 212, and the outer surface of the third concealment portion 216c may be configured to be dented inward on the outer surface of the third window 213.

[0224] The inner surface of the first concealment portion 216a may form the same plane as the inner surface of the first window 211, the inner surface of the second concealment portion 216b may form the same plane as the inner surface of the second window 212, and inner surface of the third concealment portion 216c may form the same plane as the inner surface of the third window 213.

[0225] While the concealment portion 216 of the transparent window 210 and the lower guard 240 are coupled, a total thickness of the concealment portion 216 and the lower guard 240 may be configured to correspond to a thickness of each of the first window 211, the second window 212, and the third window 213. The total thickness of the first concealment portion 216a and the first lower guard 240 may be configured to correspond to the thickness of the first window 211. The total thickness of the second concealment portion 216b and the second lower guard 240b may be configured to correspond to the thickness of the second window 212. The total thickness of the third concealment portion 216c and the third lower guard 240c may be configured to correspond to the thickness of the third window 213 (see FIGS. 9a and 9b).

[0226] A height of an upper end of the concealment portion 216, a height of the upper end of the lower guard 240, and a height of the upper end of the base 220 may be configured to correspond to each other (see FIGS. 9a and

9b).

[0227] As configured as above, a shoe care device 1 may be provided in which the transparent window 210, the base 220, and the lower guard 240 are stably coupled at the lower side of the moving body 200, the aesthetics of the moving body 200 may be enhanced.

[0228] FIG. 6 is a cross-sectional view illustrating the lower side of the shoe care device 1 according to an embodiment of the present invention.

[0229] A plurality of rotation balls 260 may be rotatably coupled to the table accommodation part 221. The rotation balls 260 may protrude upwardly above the second base surface 221a. The rotation balls 260 may be in point contact with the bottom surface of the turntable 230 to support the load of the turntable 230.

[0230] FIG. 7a is a partially enlarged view illustrating the receptacle 228 and the rotation ball 260 in FIG. 6. FIG. 7b is a partially enlarged view illustrating a state in which the rotation ball 260 is removed from the receptacle 228 in FIG. 5c. FIG. 7c is a partial cross-sectional view illustrating a state in which the rotation ball 260 is removed from the receptacle 228 in FIG. 5c.

[0231] The table accommodation part 221 may have a plurality of receptacles 228. The receptacles 228 may have portions to which the rotation balls 260 are rotatably coupled. Each of the receptacles 228 may include an accommodation body 228a and a restraining protrusion 228b.

[0232] The accommodation body 228a may have a convex shape downward from the table accommodation part 221. The accommodation body 228a may form a hemispherical shell shape. The accommodation body 228a may form a hemispherical groove 228c open upward inside the hemispherical shell shape. The accommodation body 228a may accommodate at least the lower portion of the rotation ball 260. The rotation ball 260 may be inserted into the hemispherical groove 228c.

[0233] The rotation balls 260 may each be made in a completely spherical shape.

[0234] The curvature radius of the inner surface of the hemispherical groove 228c may be somewhat larger than the radius of the rotation ball 260. That is, the diameter of the inner surface of the hemispherical groove 228c may be larger than the diameter of the rotation ball 260. Thus, the rotation ball 260 may be in point contact with the inner surface of the hemispherical groove 228c while being inserted into the hemispherical groove 228c. Therefore, the rotation ball 260 may be able to rotate smoothly while being inserted in the hemispherical groove 228c.

[0235] The tops of the rotation balls 260 may be in point contact with the bottom surface of the turntable 230 to support the load of the turntable 230. Kinetic energy of the turntable 230 may be transferred to the rotation balls 260 via the point contact between the bottom of the turntable 230 and the tops of the rotation balls 260. In this case, the rotation balls 260 may each be rotated by the kinetic energy of the turntable 230 while being inserted in the

hemispherical groove 228c.

[0236] As the rotation ball 260 is in point contact with the accommodation body 228a and the turntable 230 and is rolled by the kinetic energy of the turntable 230, the frictional resistance between the turntable 230 and the rotation ball 260 may be reduced, thereby reducing the kinetic energy loss of the motor 290. Thus, the motor 290 having a smaller capacity than an existing motor may be used to rotate the turntable 230. Therefore, the volume and weight of the shoe care device 1 may be reduced by the reduction of the capacity of the motor 290.

[0237] The rotation shaft of motor 290 is simply inserted into a boss on the bottom surface of turntable 230 to transmit a rotational force, and the rotation balls 260 may support the load of the turntable 230 and a shoe S. During rotation of the turntable 230, the rotation balls 260 may distribute and support the load of the turntable 230 and the shoe S while being rotated by the kinetic energy of the bottom surface of the turntable 230.

[0238] Thus, elastic bending deformation of the turntable 230 may be prevented even when the center of gravity of the shoe S is spaced apart in the horizontal direction from the rotation shaft of the turntable 230. Therefore, even when the shoe care device 1 is used for a long period of time, fatigue failure of the turntable 230 due to the load of the shoe S may be minimized, and the upper surface of the turntable 230 may remain flat for a long period of time.

[0239] The rotation balls 260 may be made of engineering plastics having excellent strength and elasticity.

[0240] In one example, the rotation balls 260 may be made of polyamide, polyacetal, polycarbonate, polyethylene terephthalate, modified polyphenylene oxide, or the like.

[0241] As described above, the rotation balls 260 may each form a complete sphere shape. Thus, the height of the rotating rotation balls 260 may be constant at all times with respect to the second base surface 221a. Thus, the height of the upper surface of the rotating turntable 230 may be constant at all times with respect to the first base surface 220a. Therefore, the shoe S may be rotated at a constant height, and the display effect of the shoe S may be improved.

[0242] A plurality of through-holes 228d may be formed in the accommodation body 228a. The through-holes 228d may literally pass through the accommodation body 228a. The formation of the through-holes 228d may reduce the area of the inner surface of the accommodation body 228a that is in point contact with the rotation ball 260.

[0243] Thus, the friction between the accommodation body 228a and the rotation ball 260 may be reduced, thereby minimizing the kinetic energy loss of the motor 290. Therefore, the turntable 230 may be rotated using the motor 290 having a smaller capacity than an existing motor. Accordingly, the volume and weight of the shoe care device 1 may be reduced by the reduction of the capacity of the motor 290.

[0244] The through-holes 228d may be formed in an upward and downward direction. The through-holes 228d may be rotationally symmetrical to each other with respect to an imaginary longitudinal axis passing through the center of the curvature radius of the inner surface of the hemispherical groove 228c.

[0245] The formation of the through-holes 228d may facilitate elastic deformation of the accommodation body 228a. Thus, when the shoe S is placed on the turntable 230, an impact force applied to the turntable 230 may be dissipated by the elastic deformation of the accommodation body 228a. Therefore, the likelihood of damage to the turntable 230 and the rotation ball 260 due to the impact force applied to the turntable 230 when the shoe S is placed on the turntable 230 may be reduced.

[0246] The restraining protrusion 228b may extend upward from the edge of the hemispherical groove 228c so as to restrain the separation of the rotation ball 260. Each of the restraining protrusions 228b may have a contact surface (hereinafter, referred to as the "restraining surface 228e") that restrains the separation of the rotation ball 260. The restraining surface 228e may have the same curvature as the inner surface of the hemispherical groove 228c.

[0247] The hemispherical groove 228c may literally form a hemisphere shape. Thus, the inner surface of the hemispherical groove 228c may have a maximum diameter at the top of the hemispherical groove 228c. In addition, the restraining protrusion 228b may extend upward from the edge of the hemispherical groove 228c. Thus, the restraining surface 228e may be closer to the imaginary longitudinal axis passing through the center of the curvature radius of the inner surface of the hemispherical groove 228c toward the top of restraining surface.

[0248] A plurality of restraining protrusions 228b may be provided at the edge of the hemispherical groove 228c. The restraining protrusions 228b may be rotationally symmetrical to each other with respect to the imaginary longitudinal axis passing through the center of the curvature radius of the inner surface of the hemispherical groove 228c. Therefore, the restraining surfaces 228e may be closer to each other toward the tops thereof.

[0249] An imaginary circle connecting the tops of the restraining surfaces 228e may have a diameter smaller than the rotation ball 260. Thus, the restraining protrusions 228b may restrain the separation of the rotation ball 260 from the hemispherical groove 228c.

[0250] As the rotation ball 260 is inserted into the hemispherical groove 228c, the restraining protrusions 228b may be elastically bent and deformed by the rotation ball 260. That is, the restraining protrusions 228b may be spread apart from each other around the imaginary longitudinal axis, which passes through the center of the curvature radius of the inner surface of the hemispherical groove 228c, by the rotation ball 260 and then return again.

[0251] The top of the rotation ball 260 may be higher

than the top of the restraining protrusion 228b. Thus, the restraining protrusions 228b may not rub against the bottom surface of the turntable 230.

[0252] The restraining protrusions 228b and the through-holes 228d may each be rotationally symmetrical with respect to the center of the hemispherical groove 228c, but the through-holes 228d may be positioned below the restraining protrusions 228b. The restraining surface 228e may be connected to the inner space of each of the through-holes 228d. When the rotation ball 260 is moved toward one of the through-holes 228d in the hemispherical groove 228c, the restraining surface 228e or the inner surface of the through-hole 228d may be in point contact with the rotation ball 260.

[0253] FIG. 8 is a plan view illustrating a state in which the turntable 230 is removed from the moving body 200 in FIG. 5c.

[0254] Each restraining protrusion 228b may include a pair of first restraining protrusions 228b1 and a pair of second restraining protrusions 228b2.

[0255] The pair of first restraining protrusions 228b1 may be disposed at the same radius as the center of the hemispherical groove 228c around the vertical shaft 231. That is, one of the pair of first restraining protrusions 228b1 and the other thereof may be disposed at the same radius as the center of the hemispherical groove 228c around the vertical shaft 231, and may be disposed opposite each other about an imaginary longitudinal axis passing through the center of the radius of curvature of the inner surface of the hemispherical groove 228c.

[0256] The direction of kinetic energy applied to the rotation ball 260 from the turntable 230 during reciprocating rotation of the turntable 230 forms a circumferential direction around the vertical shaft 231.

[0257] In addition, the pair of first restraining protrusions 228b1 are positioned in the direction of transmission of the kinetic energy applied to the rotation ball 260 from the turntable 230 during the reciprocating rotation of the turntable 230. Therefore, the pair of first restraining protrusions 228b1 may firmly restrain the separation of the rotation ball 260 by the kinetic energy applied to the rotation ball 260 from the turntable 230.

[0258] The pair of second restraining protrusions 228b2 may be disposed on a line passing through the center of the hemispherical groove 228c around the vertical shaft 231. That is, one of the pair of second restraining protrusions 228b2 and the other thereof may be disposed on a line passing through the center of the hemispherical groove 228c around the vertical shaft 231, and may be disposed opposite each other with respect to the imaginary longitudinal axis through the center of the radius of curvature of the inner surface of the hemispherical groove 228c.

[0259] When the center of gravity of a shoe S is spaced horizontally apart from the vertical shaft 231, centrifugal force acting on the shoe S during reciprocating rotation of the turntable 230 acts in a direction away from the vertical shaft 231.

[0260] One of the pair of second restraining protrusions 228b2 is positioned in the direction of transmission of the centrifugal force during reciprocating rotation of the turntable 230. Thus, the pair of second restraining protrusions 228b2 may restrain the separation of the rotation ball 260 by the centrifugal force acting on the shoe S during rotation of the turntable 230.

[0261] The rotation balls 260 may be rotationally symmetrical around the vertical shaft 231. Thus, the rotation balls 260 may distribute and support the load of the turntable 230 and the shoe S in a rotationally symmetrical form around the vertical shaft 231. Thus, the load of the turntable 230 and the shoe S may be distributed in a rotationally symmetrical form around the vertical shaft 231 and applied to the table accommodation part 221.

[0262] Therefore, elastic bending deformation of the turntable 230 may be prevented even when the center of gravity of the shoe S is spaced horizontally from the rotation shaft of the turntable 230. Therefore, even when the shoe care device 1 is used for a long period of time, fatigue failure of the turntable 230 due to the load of the shoe S is minimized, and the upper surface of the turntable 230 may remain flat for a long period of time.

[0263] The rotation balls 260 may include a plurality of first rotation balls 261 and a plurality of second rotation balls 262.

[0264] The first rotation balls 261 may be arranged along a circumferential direction at a first distance 261L from the vertical shaft 231. The second rotation balls 262 may be arranged along a circumferential direction at a second distance 262L from the vertical shaft 231. The second distance 262L may be longer than the first distance 261L.

[0265] The first rotation balls 261 and the second rotation balls 262 may have the same shape and size. That is, the first rotation balls 261 and the second rotation balls 262 may be distinguished by a distance from the vertical shaft 231.

[0266] The first rotation balls 261 may distribute and support the load of the turntable 230 and the shoe S in a rotationally symmetrical form at the first distance 261L around the vertical shaft 231. The second rotation balls 262 may distribute and support the load of the turntable 230 and the shoe S in a rotationally symmetrical form at the second distance 262L around the vertical shaft 231.

[0267] The center of gravity of the shoe S may be closer to the vertical shaft 231 than to the edge of the turntable 230, even when the center of gravity of the shoe S is spaced horizontally from the rotation shaft of the turntable 230. The rotation balls 260 supports more weight when the rotation balls 260 are horizontally closer to the center of gravity of the shoe S. Therefore, the number of first rotation balls 261 may be greater than the number of second rotation balls 262.

[0268] As more rotation balls 260 are positioned at the first distance 261L closer than the second distance 262L relative to the rotation shaft of the turntable 230, the weight of the shoe S may be evenly distributed through-

out the first rotation balls 261 and the second rotation balls 262. Therefore, even when the shoe care device 1 is used for a long period of time, fatigue failure of the turntable 230, the rotation balls 260, and the base due to the load of the shoe S may be minimized, and the upper surface of the turntable 230 may remain flat for a long period of time.

[0269] FIG. 9a is a perspective view illustrating a state in which the accommodation space of the shoe care device 1 in FIG. 1a is open, and illustrates a state in which an information sheet 500 is coupled to a second internal cabinet.

[0270] FIG. 9b is a perspective view illustrating a state in which the accommodation space of the shoe care device 1 in FIG. 1a is open, and illustrates a state in which the information sheet 500 is moved through a second gap.

[0271] As illustrated in FIGS. 9a and 9b, the shoe care device 1 according to an embodiment of the present invention further includes the information sheet 500. The information sheet 500 may be detachably coupled to the body within the accommodation space by magnetic force.

[0272] As illustrated in FIG. 9a, with the accommodation space 10 open, a user may insert or withdraw the information sheet 500 into or from the accommodation space 10 through the second gap. Alternatively, the user may insert or withdraw the information sheet 500 into or from the accommodation space 10 through the third gap while tilting the information sheet 500 slightly.

[0273] The body 100 may include the middle body 120 that forms the rear surface of the accommodation space 10 together with the information sheet 500.

[0274] The front surface of the middle body 120 may include a first intermediate front surface 120a. The first intermediate front surface 120a may be a surface which is in close contact with information sheet 500.

[0275] When the information sheet 500 is separated from the middle body 120, the first intermediate front surface 120a may form the rear surface of the accommodation space 10. In the accommodation space 10, the first intermediate front surface 120a may form a rectangular-shaped plane.

[0276] As illustrated in FIG. 9b, the information sheet 500 may be in close contact with the first intermediate front surface 120a by magnetic force. As the information sheet 500 is in close contact with the first intermediate front surface 120a, the front surface of the information sheet 500 may form the rear surface of the accommodation space 10 together with the first intermediate front surface 120a.

[0277] FIG. 10a is a perspective view illustrating the front surface of the information sheet 500 in FIG. 9a. FIG. 10b is a perspective view illustrating the rear surface of the information sheet 500 in FIG. 9a.

[0278] The information sheet 500 may have the shape of a thin plate. The rear surface of the information sheet 500 may be in close contact with the front surface of the

middle body 120.

[0279] The front surface and/or the rear surface of the information sheet 500 may have a shape similar to that of the front surface of the middle body 120. For example, the first intermediate front surface 120a may form a rectangular shape, and the front surface of the information sheet 500 may have a rectangular shape.

[0280] The front surface and/or the rear surface of the information sheet 500 may have a shape different from that of the front surface of the middle body 120.

[0281] In an example, the first intermediate front surface 120a may have a rectangular shape, and the front surface and/or the rear surface of the information sheet 500 may have a circular, oval, or polygonal shape. Alternatively, the front surface and/or the rear surface of the information sheet 500 may have various shapes such as a person, animal, and cloud.

[0282] As described above, the information sheet 500 may form aesthetics with various colors and shapes. Thus, the interior effect of the information sheet 500 may be maximized. The display effect of the shoe S may be improved by forming various aesthetics of the information sheet 500.

[0283] The front surface of the information sheet 500 may be made of a material identical to or similar to that of the front surface of the middle body 120.

[0284] Thus, whether the information sheet 500 is coupled to the front surface of the middle body 120 or not, light from a first light 410 and a second light 420 reflected from the rear surface of the accommodation space 10 may be transmitted to the field of view of a person looking at a shoe S in the same or similar manner. Therefore, whether the information sheet 500 is coupled to the front of the middle body 120 or not, the accommodation space 10 may form a certain aesthetic based on the light.

[0285] The information sheet 500 may literally refer to a sheet including information. The information may be a broad set of symbols, such as characters, shapes, images, etc. In one example, the information sheet 500 may be a sheet printed with photographs, drawings, or text.

[0286] The information sheet 500 may be exposed to the field of view of a person looking at the shoe S accommodated in the shoe care device 1. Thus, a user of the shoe care device 1 may display photos and drawings on the rear surface of the accommodation space 10 by attaching the information sheet 500 to the front surface of the middle body 120.

[0287] The information sheet 500 may include one or more magnets 540. A recessed portion 521 (hereinafter, referred to as "recess") may be formed on the rear surface of the information sheet 500. A plurality of recesses 521 may be formed along the edge of the information sheet 500. The permanent magnets 540 may be inserted into the recesses 521. The magnets 540 may form attraction by magnetic force with a magnetic plate 127 provided on the middle body 120.

[0288] FIG. 11 is a perspective view of the shoe care device 1 according to an embodiment of the present invention, viewed from the rear.

[0289] FIG. 12 is a perspective view illustrating a state in which a first external cabinet 136 and a second external cabinet 125 are separated from the body of the shoe care device 1 in FIG. 1a.

[0290] The body 100 may include the upper body 130. The upper body 130 may be positioned above the accommodation space 10. The upper body 130 may have an upper space 130a of which gas flow is disconnected from the accommodation space therein. The upper space 130a may have a hexahedral shape in which lengths in the first direction X and the second direction Y are larger than a length in the third direction Z.

[0291] The upper body 130 may include a first internal cabinet 135 and a first external cabinet 136. The first internal cabinet 135 and the first external cabinet 136 may form the accommodation space 10 jointly.

[0292] As illustrated in FIG. 20a, the first internal cabinet 135 may have a rectangular box shape opened upward. The first internal cabinet 135 may have an air flow channel 300 connected to the accommodation space 10. The first internal cabinet 135 may include an upper bottom plate 135a.

[0293] The upper bottom plate 135a may partition the accommodation space 10 and the upper space 130a. The lower surface of the upper bottom plate 135a may form the top of the accommodation space 10. The upper surface of the top bottom plate 135a may form the bottom of the upper space 130a. The upper bottom plate 135a may have a plate shape which is wide in the horizontal direction.

[0294] The blowing part 330 is a component that circulates air in the accommodation space 10. The blowing part 330 and the air flow channel 300 may be provided on the upper surface of the upper bottom plate 135a.

[0295] The blowing part 330 may include a fan 331 and a fan housing 332. The fan 331 may pressure-feed the air by a rotary motion of an impeller. The fan housing 332 may constitute a part of the air flow channel 300.

[0296] A heater 340 may be configured to directly or indirectly heat air in the accommodation space 10. The heater 340 may be disposed in the body 100. The heater 340 may be disposed in the air flow channel 300.

[0297] As illustrated in FIG. 2b, an inlet 310 and an outlet 320 may be formed in the upper bottom plate 135a.

[0298] Air in the accommodation space 10 may be suctioned into the air flow channel 300 through the inlet 310. The air in the air flow channel 300 may be discharged into the accommodation space 10 through the outlet 320. Thus, air forcedly blown by the blowing part 330 may circulate in the accommodation space 10 and the air flow channel 300.

[0299] A first light 410 may emit light on the upper surface of the turntable 230 on which a shoe S is placed at an extension of the vertical shaft 231. A second light 420 may be configured to illuminate the front surface of

the middle body 120 from behind the first light 410. The first light 410 and the second light 420 may be coupled to the upper bottom plate 135a.

[0300] A controller 600 may be coupled to the upper bottom plate 135a.

[0301] The middle body 120 may include a second internal cabinet 124 and a second external cabinet 125. The first external cabinet 136 and the second external cabinet 125 may be coupled to the second internal cabinet 124 by a plurality of bolts 126b.

[0302] The second internal cabinet 124 may include a magnetic plate 127 and a resin panel 126.

[0303] The resin panel 126 may form the rear surface of the accommodation space. The magnetic plate 127 may be coupled to the rear surface of the resin panel 126.

[0304] Given that the upper body 130 is a type of cantilevered structure that protrudes from the middle body 120, problems such as sagging of the front end of the upper body 130 may occur when the middle body 120 does not adequately support the upper body 130.

[0305] In the shoe care device 1 according to an embodiment of the present invention, as the magnetic plate 127 having relatively high density is coupled to the rear surface of the resin panel 126 having relatively low density, the center of gravity of the second internal cabinet 124 is positioned behind the resin panel 126, and this may act as a factor to prevent the front end of the upper body 130 from sagging.

[0306] The magnetic plate 127 may be made of a ferromagnetic material that is strongly magnetized in the direction of a magnetic field when the magnetic field is applied. For example, magnetic plate 127 may be made of iron, cobalt, nickel, and alloys thereof. Thus, the magnetic plate 127 may form attraction by magnetic force with the permanent magnet 540 coupled to the information sheet 500.

[0307] The first internal cabinet 135 and the second internal cabinet 124 may be coupled to a frame body 800. The frame body 800 may be an element which forms the skeleton of the body 100. The body 100 may be reinforced by the frame body 800.

[0308] The frame body 800 as a part that is coupled to the body 100 and supports the body 100 in a shape of connecting the upper surface, the lower surface, and the rear surface of the body 100 may reinforce each connection portion of the body 100 which has a relatively vulnerable rigidity structurally.

[0309] As described above, in order to for the moving body 200 to slidably move with respect to the body 100, the front surface of the body 100 needs to be opened to correspond to the shape of the moving body 200. Therefore, the body 100 should be formed in a structure to approximately support even a load applied to the opened front surface at portions other than the front surface.

[0310] However, in that the body 100 has various components placed therein, and it is possible to form the size or the rigidity to be unlimitedly large, it is necessary to reinforce a structurally vulnerable portion with a

separate reinforcing member.

[0311] In particular, when the body 100 is formed in a shape in which the front surface is opened, it is necessary to support even the load applied to the front surface on the reaming upper surface, lower surface, and the rear surface, so it may be preferable to reinforce each connection portion of the parts.

[0312] As such, in the shoe care device 1 according to the embodiment, since the frame body 800 is coupled to the body 100 in a shape connecting the upper surface, the lower surface, and the rear surface of the body 100 to support the body 100, the shoe care device 1 may maintain a stable state by reinforcing a structural vulnerable part in the body 100.

[0313] In the shoe care device 1 according to an embodiment of the present invention, the frame body 800 may include an upper frame 830 coupled to the upper body 130, a lower frame 810 coupled to the lower body 110, and an intermediate frame 820 coupled to the middle body 120 and connecting the rear sides of the upper frame 830 and the lower frame 810.

[0314] A plurality of bosses 126a having female screws may protrude rearward from the rear surface of resin panel 126. Thus, the intermediate frame 820 may be fastened to the bosses 126a by the bolts 126b.

[0315] The body 100 including the lower body 110, the middle body 120, and the upper body 130, which are combined, may be formed in a U-shape when viewed from the side, so that the body 100 may form three surfaces of the shoe care device 1 in three-dimensional space.

[0316] Thus, since the upper body 130 and the lower body 110 are formed to protrude forward from the middle body 120, there may be virtually no structure for supporting load at the front ends of the upper body 130 and the lower body 110.

[0317] In particular, given that the upper body 130 is a type of cantilevered structure that protrudes from the middle body 120, problems such as sagging of the front end of the upper body 130 may occur when the middle body 120 does not adequately support the upper body 130.

[0318] In this case, given that there are structural limitations to supporting upper body 130 with only middle body 120, it may be preferable to reinforce the connection portions of the lower body 110 and the middle body 120 via the frame body 800, and then reinforce both the middle body 120 and the upper body 130 via such frame body 800.

[0319] Accordingly, it may be preferable to provide reinforcement in a structure in which the upper body 130, the lower body 110, and the middle body 120 of the body 100 are connected to each other through the upper frame 830, the lower frame 810, and the intermediate frame 820 of the frame body 800.

[0320] In other words, the frame body 800 may also be formed in a U-shape when viewed from the side, thereby reinforcing structurally weak portions of the U-shaped

body 100.

[0321] As such, in the shoe care device 1 according to the present embodiment, the frame body 800 includes the upper frame 830, the lower frame 810, and the intermediate frame 820, so that the weak portions of the body 100 may be reinforced with a structure in which the upper body 130, the lower body 110, and the middle body 120 are connected to each other.

[0322] In the shoe care device 1 according to an embodiment of the present invention, the upper frame 830, the lower frame 810, and the intermediate frame 820 may be formed by bending one member formed to extend in the longitudinal direction.

[0323] In the shoe care device 1 according to the present embodiment, the frame body 800 including the upper frame 830, the lower frame 810, and the intermediate frame 820 may be formed by bending one member formed to extend in the longitudinal direction, thereby facilitating the manufacturing of the frame body 800 as well as minimizing the cut surface of the frame body 800 corresponding to the reinforcement member.

[0324] In the shoe care device 1 according to an embodiment of the present invention, the frame body 800 may be disposed inside the body 100. Since the frame body 800 is disposed so as not to be exposed to the outside, a visual aesthetic may be provided by minimizing the exposure of members that are not directly related to the function of the shoe care device 1.

[0325] In the shoe care device 1 according to an embodiment of the present invention, a plurality of frame bodies 800 may be disposed along the leftward/rightward direction of the body 100.

[0326] The frame bodies 800 may include a first frame body 800A and a second frame body 800B. The first frame body 800A may be disposed on the left side of the body 100. The second frame body 800B may be disposed on the right side of the body 100.

[0327] It may be preferable to place the frame body 800 on the entire surface of the body 100 to reinforce the weak portions of the body 100. However, such a structure may be uneconomical and may increase the weight of the shoe care device 1.

[0328] Therefore, it may be considered that arranging the first frame body 800A and the second frame body 800B at predetermined intervals to the extent that structural stability can be secured is most effective when considering structural rigidity and product economy.

[0329] In this case, to prevent deformation such as structural warping due to stiffness imbalance of the shoe care device 1, it may be preferable for the first frame body 800A and the second frame body 800B to be symmetrically arranged along the leftward/rightward direction of the body 100.

[0330] Thus, in the shoe care device 1 according to the present embodiment, the plurality of frame bodies 800 are arranged along the leftward/rightward direction of the body 100 to reinforce the body 100, so that structural reinforcement of the body 100 may be more uniform and

stable.

[0331] FIG. 13a is a perspective view illustrating the front surface of the second internal cabinet in FIG. 12. FIG. 13b is a perspective view illustrating the rear surface of the second internal cabinet in FIG. 12. FIG. 13c illustrates the rear surface of the second internal cabinet in FIG. 12.

[0332] The second internal cabinet 124 may include the magnetic plate 127 and the resin panel 126.

[0333] The resin panel 126 may form the rear surface of the accommodation space. The front surface of the resin panel 126 may include a first intermediate front surface 120a, a second intermediate front surface 120b, a third intermediate front surface 120c, a step surface 120e, and a bent surface 120f.

[0334] As described above, the first intermediate front surface 120a may be a surface which is in close contact with the information sheet 500. The first intermediate front surface 120a may have a rectangular shape.

[0335] The second intermediate front surface 120b may be positioned above the first intermediate front surface 120a. The second intermediate front surface 120b may be a surface that is in close contact with the rear surface of the first internal cabinet. The second intermediate front surface 120b may have a plurality of holes so as to be fastened to the rear-side surface of the first internal cabinet by the bolts 126b.

[0336] The second intermediate front surface 120b may be provided behind the first intermediate front surface 120a in a first direction X. The step surface 120e may be formed between the first intermediate front surface 120a and the second intermediate front surface 120b. With the bottom surface of the upper bottom plate 135a being in close contact with the step surface 120e, the second intermediate front surface 120b may be fastened to the rear side surface of the first internal cabinet by the bolts 126b.

[0337] The third intermediate front surface 120c may be positioned below the first intermediate front surface 120a. The third intermediate front surface 120c may have a shape in which the third intermediate front surface 120c extends downward from the first intermediate front surface 120a. The base 220 may cover the third intermediate front surface 120c in a closed state. The third intermediate front surface 120c may have a plurality of holes so as to be fastened to the rear-side surface of the lower body 110 by the bolts 126b.

[0338] The bent surface 120f may be shaped to be bent a certain length backward from the left and right edges and the top edge of resin panel 126. The strength of the resin panel 126 to resist external forces may be enhanced by the bent surface 120f.

[0339] The magnetic plate 127 may have a rectangular flat plate shape. The magnetic plate 127 may be made of a ferromagnetic material that is strongly magnetized in the direction of a magnetic field when the magnetic field is applied. In one example, the magnetic plate 127 may be made of iron, cobalt, nickel, and alloys thereof. Thus, the

magnetic plate 127 may form attraction by magnetic force with the permanent magnet 540 coupled to the information sheet 500.

[0340] The magnetic plate 127 may be coupled to the rear surface of the resin panel 126. As described above, the first intermediate front surface 120a may refer to a surface which is in close contact with the information sheet 500. The magnetic plate 127 may be positioned on the rear surface of the first intermediate front surface 120a such that the information sheet 500 is in close contact with the first intermediate front surface 120a by magnetic force.

[0341] The first intermediate front surface 120a may have an area larger than the information sheet 500. The transverse width of the first intermediate front surface 120a may be larger than the transverse width of the information sheet 500. In addition, the longitudinal width of the first intermediate front surface 120a may be larger than the longitudinal width of the information sheet 500. Thus, the position at which the information sheet 500 is coupled to the first intermediate front surface 120a may be adjusted.

[0342] The interior effect caused by the information sheet 500 may be maximized by adjusting the position of the information sheet 500 attached to the first intermediate front surface 120a behind the shoe accommodated in the accommodation space. The display effect of the shoe S may be enhanced by the printed content of the information sheet 500 and the aesthetics of the color/-shape of the information sheet 500.

[0343] The second internal cabinet may be manufactured by integrating the magnetic plate 127 and the resin panel 126 through insert injection.

[0344] Insert injection is a method in which a high-strength metal insert such as steel is inserted into an injection mold, then polymer resin is injected, thereby producing a molded product in which the insert and plastic are integrated.

[0345] The insert injection method is carried out in the following sequence. First, an insert is inserted into an injection molding mold. Then, molten resin in a cylinder of an injection molding machine is filled into the mold to cover the insert with the molten resin. After cooling and solidifying the molten resin over a predetermined time, a molded product in which the insert and the plastic are integrated is ejected from the mold.

[0346] In the present invention, the insert may refer to the magnetic plate 127 and the plastic may refer to the resin panel 126. The metal material and the injected polymer resin integrated by insert injection form strength and rigidity by an interfacial bonding force.

[0347] When integrally molding the magnetic plate 127 and the resin panel 126 by insert injection, an insert rib 126c may be formed on the rear surface of the resin panel 126. The insert rib 126c may be formed along the edge of the magnetic plate 127.

[0348] The insert rib 126c may include a first insert rib 126c1 and a second insert rib 126c2.

[0349] The first insert rib 126c1 may be shaped to protrude rearward from the rear surface of resin panel 126. The first insert rib 126c1 may surround the edge of magnetic plate 127. The first insert rib 126c1 and the magnetic plate 127 may form strength and rigidity by an interfacial bonding force. The first insert rib 126c1 may form an upward/downward and leftward/rightward movement boundary of the magnetic plate 127.

[0350] The second insert rib 126c2 may extend from the rear of the first insert rib 126c1. The second insert rib 126c2 may be formed to cover the edge of the magnetic plate 127. The second insert rib 126c2 and the magnetic plate 127 may form strength and rigidity by an interfacial bonding force. The second insert rib 126c2 may form a forward/rearward movement boundary of the magnetic plate 127.

[0351] As described above, the plurality of bosses 126a having female screws may protrude rearward from the rear surface of the resin panel 126. The intermediate frame 820 may be fastened to the bosses 126a by the bolts 126b.

[0352] A plurality of through-holes 127h may be formed in magnetic plate 127. The bosses 126a may pass through the through-holes 127h and protrude rearward toward the frame body.

[0353] When the magnetic plate 127 and the resin panel 126 are integrally molded by insert injection, the bosses 126a may be in close contact with one-side surfaces of the through holes 127h. The bosses 126a form strength and rigidity by interfacial bonding forces with one-side surfaces of the through holes 127h.

[0354] When the magnet 540 of the information sheet 500 is positioned in front of the through holes 127h, the magnetic force between the information sheet 500 and the magnetic plate 127 becomes weaker. In this case, the attachment of the information sheet 500 to the first intermediate front surface 120a may be released by various types of external forces such as an impact applied to the shoe care device 1.

[0355] The through-holes 127h may be disposed at the left and right edges of the magnetic plate 127. Thus, the transverse width of a region 120g (hereinafter referred to as the "uniform region") in which the information sheet 500 and the magnetic plate 127 form a uniform magnetic force may be extended from the center of the magnetic plate 127 in the leftward/rightward direction. Therefore, even when various types of external forces such as an impact are applied to the shoe care device 1, the information sheet 500 may remain firmly attached to the first intermediate front surface 120a.

[0356] The through-holes 127h may include a first through-hole 127h1 and a second through-hole 127h2. The bosses 126a may include a first boss 126a1 and a second boss 126a2.

[0357] The first through-hole 127h1 may be disposed at the left edge of the magnetic plate 127. A plurality of first through-holes 127h1 may be formed. In one example, the first through-holes 127h1 may each be formed at

the upper and lower sides of the left edge of the magnetic plate 127.

[0358] A plurality of first bosses 126a1 may be formed. The first bosses 126a1 may each protrude rearward through the first through-holes 127h1.

[0359] The second through-hole 127h2 may be disposed at the right edge of the magnetic plate 127. A plurality of second through-holes 127h2 may be formed. In one example, the second through-holes 127h2 may each be formed in the upper and lower sides of the right edge of the magnetic plate 127.

[0360] A plurality of second bosses 126a2 may be formed. The second bosses 126a2 may each protrude rearward through the second through-holes 127h2.

[0361] When the magnetic plate 127 and the resin panel 126 are integrally molded by insert injection, the first bosses 126a1 may be in close contact with one-side surfaces of the first through-holes 127h1.

[0362] Here, the one-side surfaces of the first through-holes 127h1 may refer to surfaces opposite the second bosses 126a2 with respect to the first bosses 126a1. Furthermore, with reference to one first boss 126a1, the one-side surfaces of the first through-holes 127h1 may refer to surfaces opposite to the other first boss 126a1. The first bosses 126a1 form strength and rigidity by interfacial bonding forces with the one-side surfaces of the first through-holes 127h1.

[0363] Furthermore, when the magnetic plate 127 and the resin panel 126 are integrally molded by insert injection, the second boss 126a2 may be in close contact with one-side surfaces of the second through-holes 127h2.

[0364] Here, the one-side surfaces of the second through-holes 127h2 may refer to surfaces opposite the first bosses 126a1 with respect to the second bosses 126a2. Furthermore, with reference to one second boss 126a2, the one-side surfaces of the through holes 127h may refer to surfaces opposite to the other second boss 126a2. The second bosses 126a2 form strength and rigidity by interfacial bonding forces with the one-side surfaces of the second through-holes 127h2.

[0365] Thus, the movement of the magnetic plate 127 may be blocked by constraint by the first bosses 126a1 and the second bosses 126a2. Additionally, the movement of the magnetic plate 127 may be blocked by interfacial bonding forces with the one-side surfaces of the first boss 126a1 and the second boss 126a2.

[0366] The frame body 800 may include the first frame body 800A and the second frame body 800B.

[0367] The first frame body 800A may be disposed on the left side of the body 100. The first frame body 800A may be fastened to the first bosses 126a1 by the bolts 126b. The intermediate frame 820 of the first frame body 800A may have a plurality of holes through which screw portions of the bolts 126b pass.

[0368] The second frame body 800B may be disposed on the right side of the body 100. The second frame body 800B may be fastened to the second bosses 126a2 by the bolts 126b. The intermediate frame 820 of the second

frame body 800B may have a plurality of holes through which screw portions of the bolts 126b passes.

[0369] The through-hole 127h may be extended by an inclined core for forming the boss 126a. That is, the through-hole 127h may be extended to form a path along which the inclined core for forming the boss 126a falls out when the injection mold is opened. The inclined core is a widely known technology in the field of injection mold manufacturing, and thus a detailed description thereof will be omitted.

[0370] The through-hole 127h may be extended by the inclined core for forming the boss 126a, and may extend long above or below the boss 126a. Thus, the transverse width of the uniform region 120g may be maintained even when the through-hole 127h is extended.

[0371] Thus, even when the through-hole 127h is extended by the inclined core for forming the boss 126a, the transverse width of the uniform region 120g may be expanded in the leftward/rightward direction from the center of the magnetic plate 127. Therefore, even when various types of external forces such as an impact are applied to the shoe care device 1, the information sheet 500 may remain firmly attached to the first intermediate front surface 120a.

[0372] While specific embodiments of the present invention have been described and illustrated in the foregoing, it will be obvious to those skilled in the art that the present invention is not limited to the described embodiments and that various modifications and variations may be made without departing from the technical idea and scope of the present invention. Accordingly, such modifications or variations should not be understood in isolation from the technical idea or viewpoint of the present invention, and modified embodiments should be considered as falling within the claims of the present invention.

[Industrial Applicability]

[0373] The shoe care device according to the present invention may continuously maintain state in which a turntable stably supports a shoe regardless of the position of the center of gravity of a shoe, and may minimize the wear and tear of mechanical elements bearing the load of the shoe, even when the shoe is displayed on the upper surface of a turntable for a long period of time. In this respect, the present invention exceeds the limits of the existing technology, and thus may provide sufficient possibilities for marketing or selling a device to which the related technology is applied, not just the use of the related technology, and may be realistically and clearly implemented. Therefore, the present invention is industrially applicable.

Claims

1. A shoe care apparatus (1) having an accommodation space (10) in which a shoe is accommodated,

the shoe care apparatus (1) comprising:

a body (100);
a moving body (200) configured to form the accommodation space (10) together with the body (100); and
a blowing part (330) configured to circulate air in the accommodation space (10),
wherein the moving body (200) comprises:

a base (220) slidably coupled to the body (100) so as to open and close the accommodation space (10);
a turntable (230) coupled to the base (220), rotatable about a perpendicular rotational axis (231), and configured to form a lower surface of the accommodation space (10) together with the base (220); and
a plurality of rotation balls (260) which are rotatably coupled to the base (220), are in point contact with a bottom surface of the turntable (230), and are configured to support a load of the turntable (230).

2. The shoe care apparatus (1) of claim 1, wherein the base (220) comprises:

a first base surface (220a) positioned along a circumference of the turntable (230) and configured to form the lower surface of the accommodation space (10) together with an upper surface of the turntable (230); and
a second base surface (221a) positioned below the turntable (230), the rotation balls (260) protruding above the second base surface (221a).

3. The shoe care apparatus (1) of claim 1, wherein the rotation balls (260) are rotationally symmetrical to each other around the perpendicular rotational axis (231).

4. The shoe care apparatus (1) of claim 1, wherein the rotation balls (260) comprise:

a plurality of first rotation balls (261) arranged along a circumferential direction at a first distance (261L) from the perpendicular rotational axis (231); and
a plurality of second rotation balls (262) arranged along a circumferential direction at a second distance (262L) from the perpendicular rotational axis (231) that is longer than the first distance (261L).

5. The shoe care apparatus (1) of claim 4, wherein the number of the first rotation balls (261) is greater than the number of second rotation balls (262).

6. The shoe care apparatus (1) of claim 1, wherein the base (220) has multiple receptacles (228) to which the rotation balls (260) are rotatably coupled. to the turntable (230) so as to apply a rotational force to the turntable (230).
7. The shoe care apparatus (1) of claim 6, wherein each of the receptacles (228) comprises: 5
- an accommodation body (228a) configured to form a hemispherical groove (228c) configured to accommodate at least a lower portion of the rotation ball; and 10
- a plurality of restraining protrusions (228b) extending upward from an edge of the hemispherical groove (228c) so as to restrain separation of the rotation ball. 15
8. The shoe care apparatus (1) of claim 7, wherein a diameter of the hemispherical groove (228c) is larger than a diameter of the rotation ball, and a top of the rotation ball is higher than tops of the restraining protrusions (228b). 20
9. The shoe care apparatus (1) of claim 7, wherein each of the restraining protrusions (228b) is configured to have a contact surface (228e) to restrain the separation of the rotation ball, and the contact surface (228e) is configured to have a curvature identical to that of an inner surface of the hemispherical groove (228c). 25
- 30
10. The shoe care apparatus (1) of claim 7, wherein a plurality of through-holes (228d) are formed in the accommodation body (228a) so as to reduce friction between the accommodation body (228a) and the rotating ball. 35
- 40
11. The shoe care apparatus (1) of claim 10, wherein the restraining protrusions (228b) and the through-holes (228d) are rotationally symmetrical around a center of the hemispherical groove (228c), and the through-holes (228d) are positioned below the restraining protrusions (228b). 45
- 50
12. The shoe care apparatus (1) of claim 7, wherein each of the restraining protrusions (228b) is configured to have a contact surface (228e) to restrain the separation of the rotation ball, and one of the restraining protrusions (228b) and another thereof are disposed at the same radius as the center of the hemispherical groove (228c) around the perpendicular rotational axis (231). 55
13. The shoe care apparatus (1) of claim 1, wherein the body (100) comprises a lower body (110) positioned below the accommodation space (10) and having a lower body groove (119) having an open front side, and the moving body (200) comprises a motor (290) disposed in the lower body groove (119) and coupled

FIG. 1a

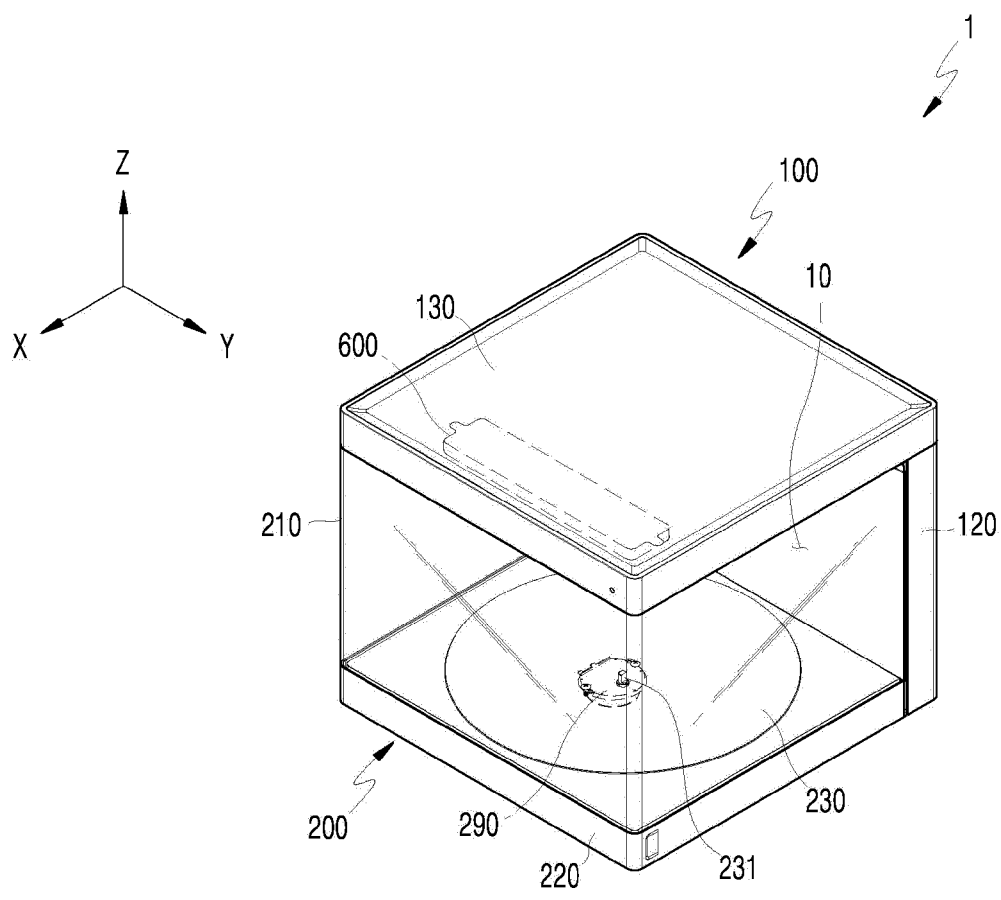


FIG. 1b

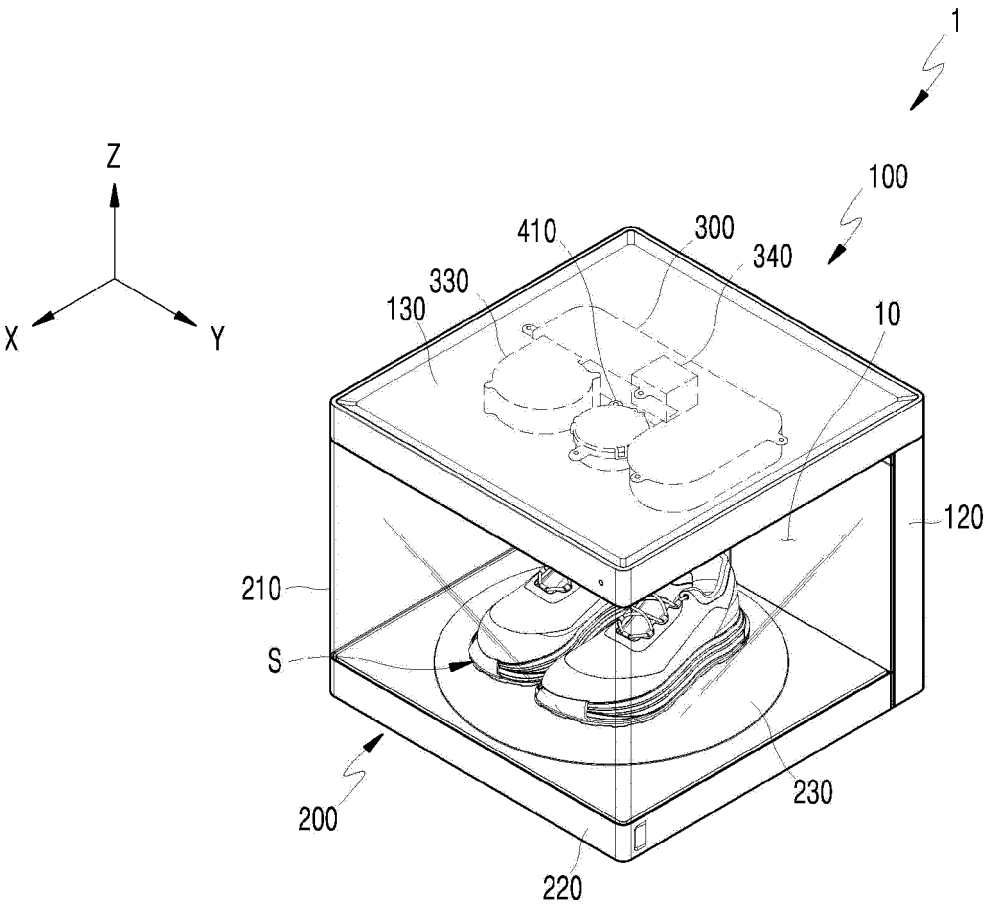


FIG. 2a

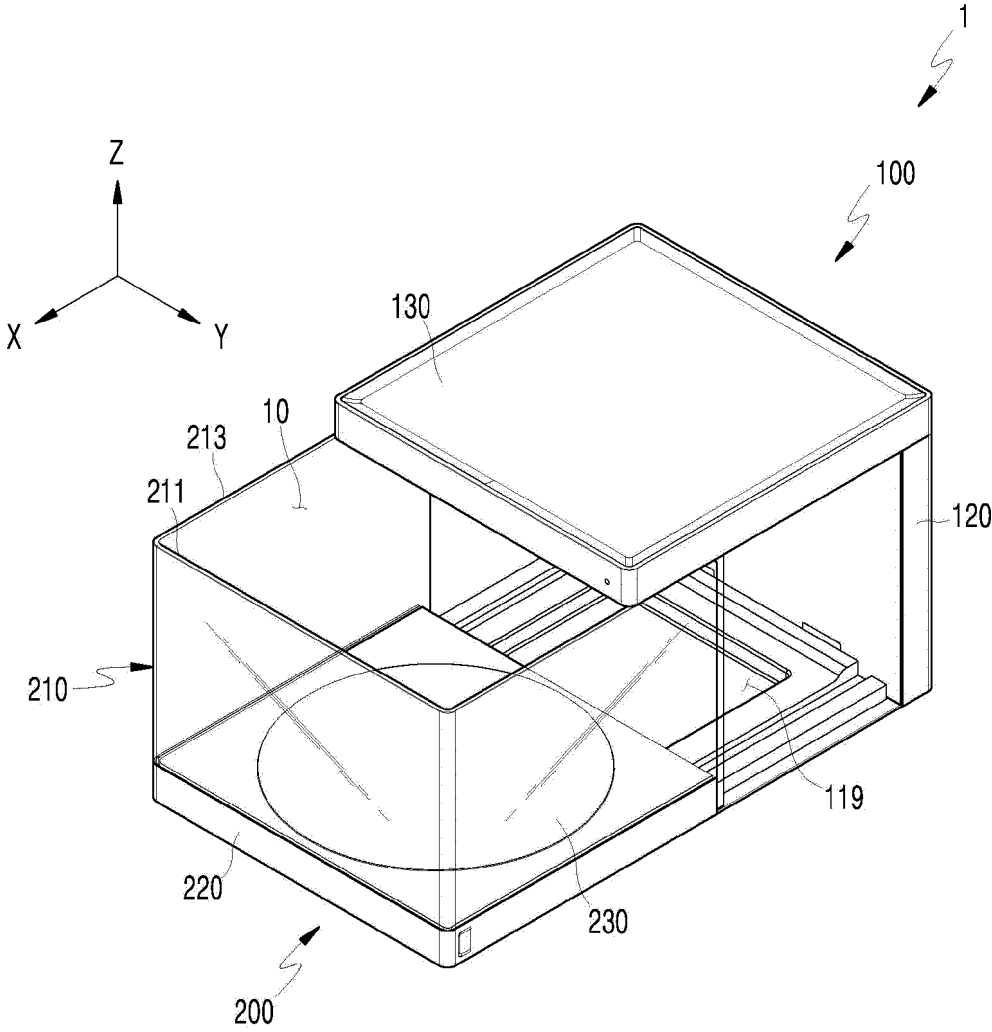


FIG. 2b

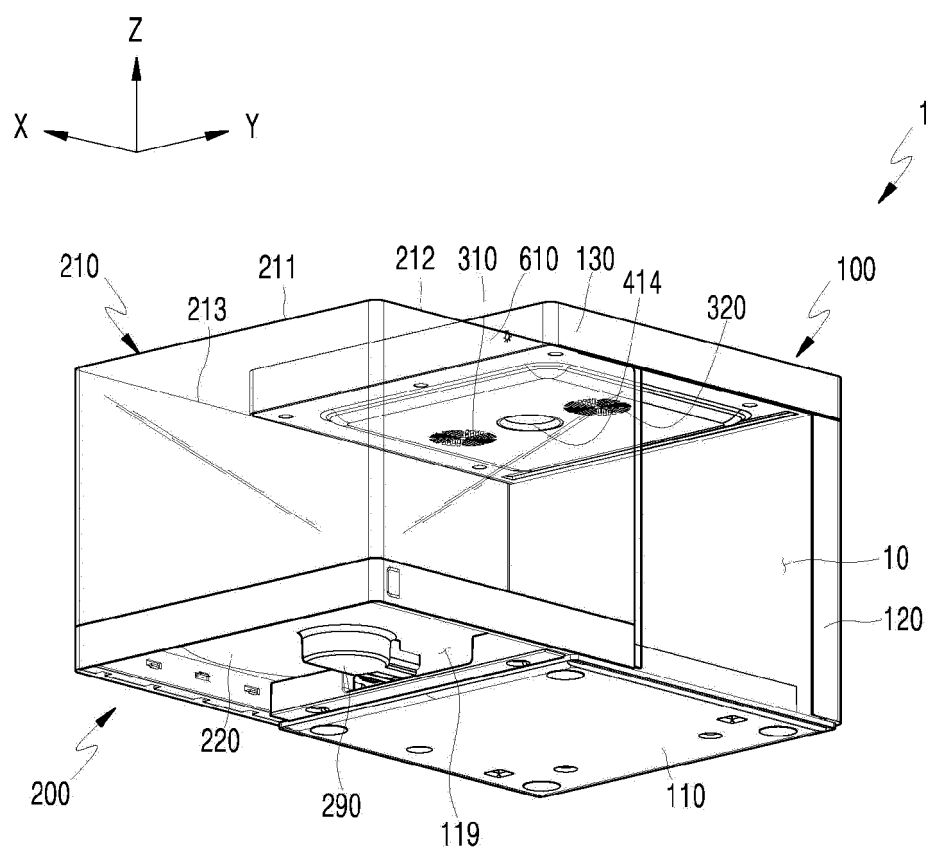


FIG. 3a

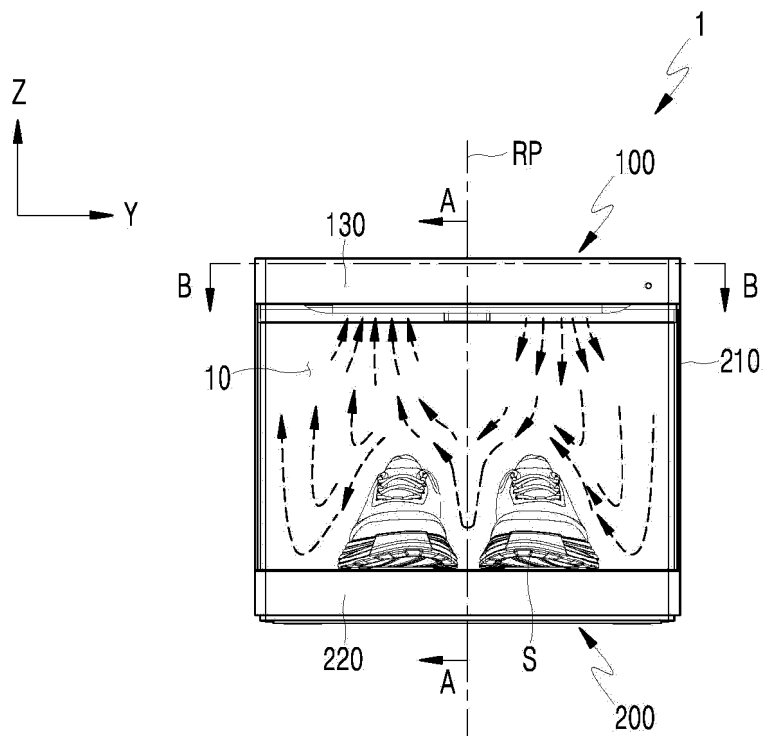


FIG. 3b

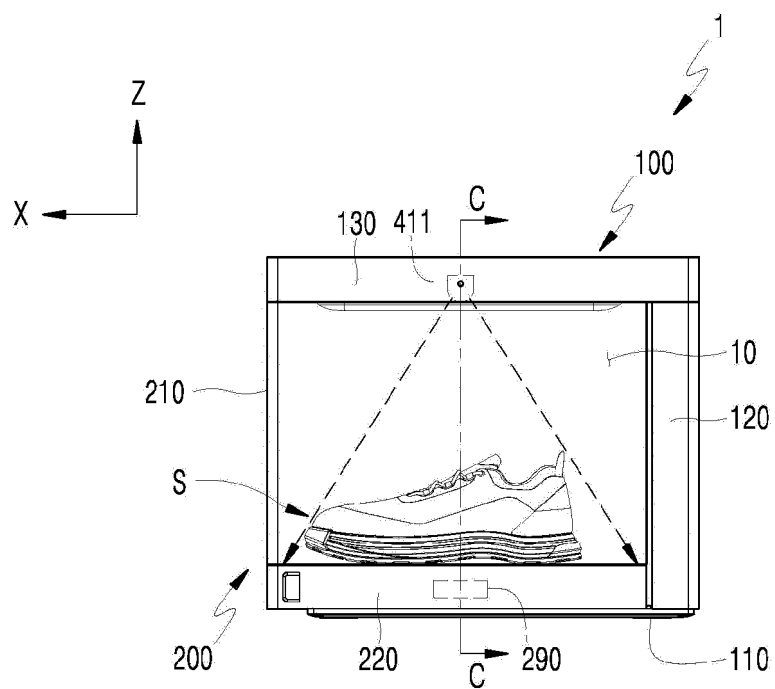


FIG. 4

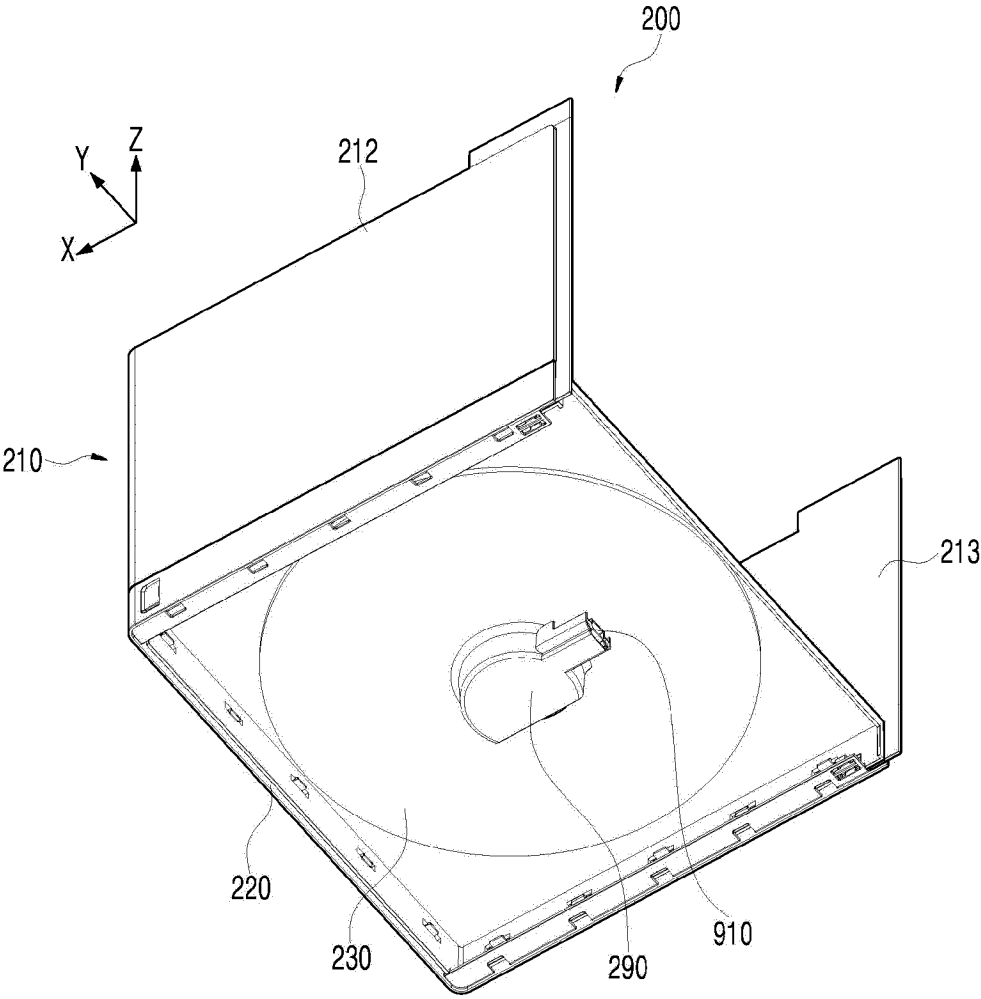


FIG. 5a

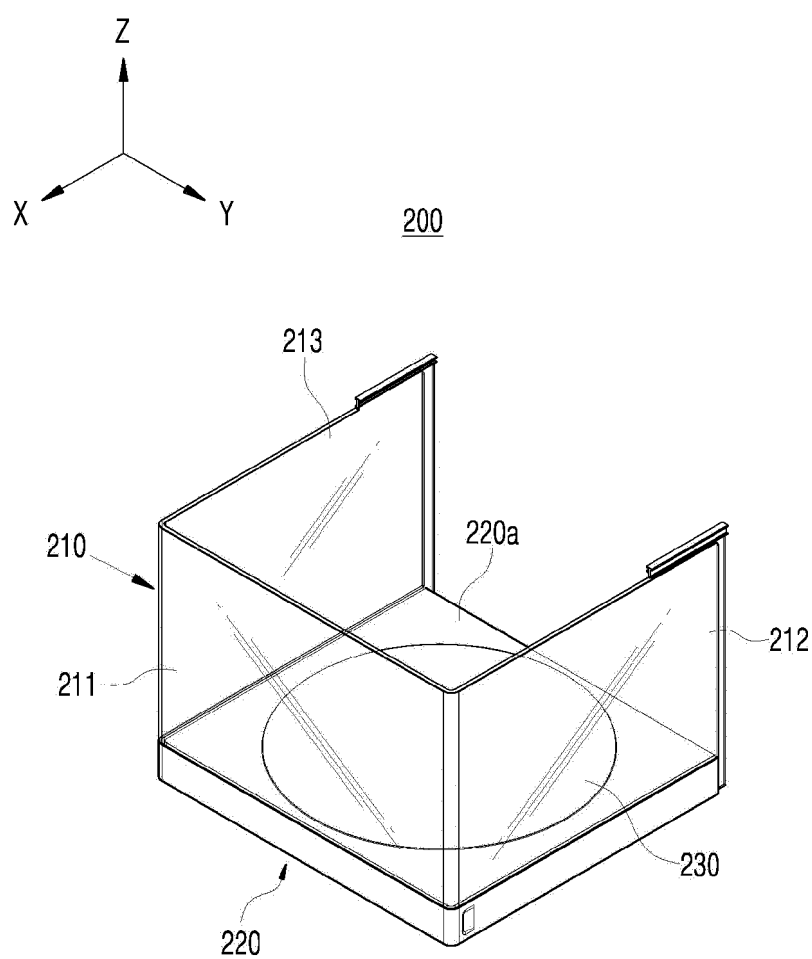


FIG. 5b

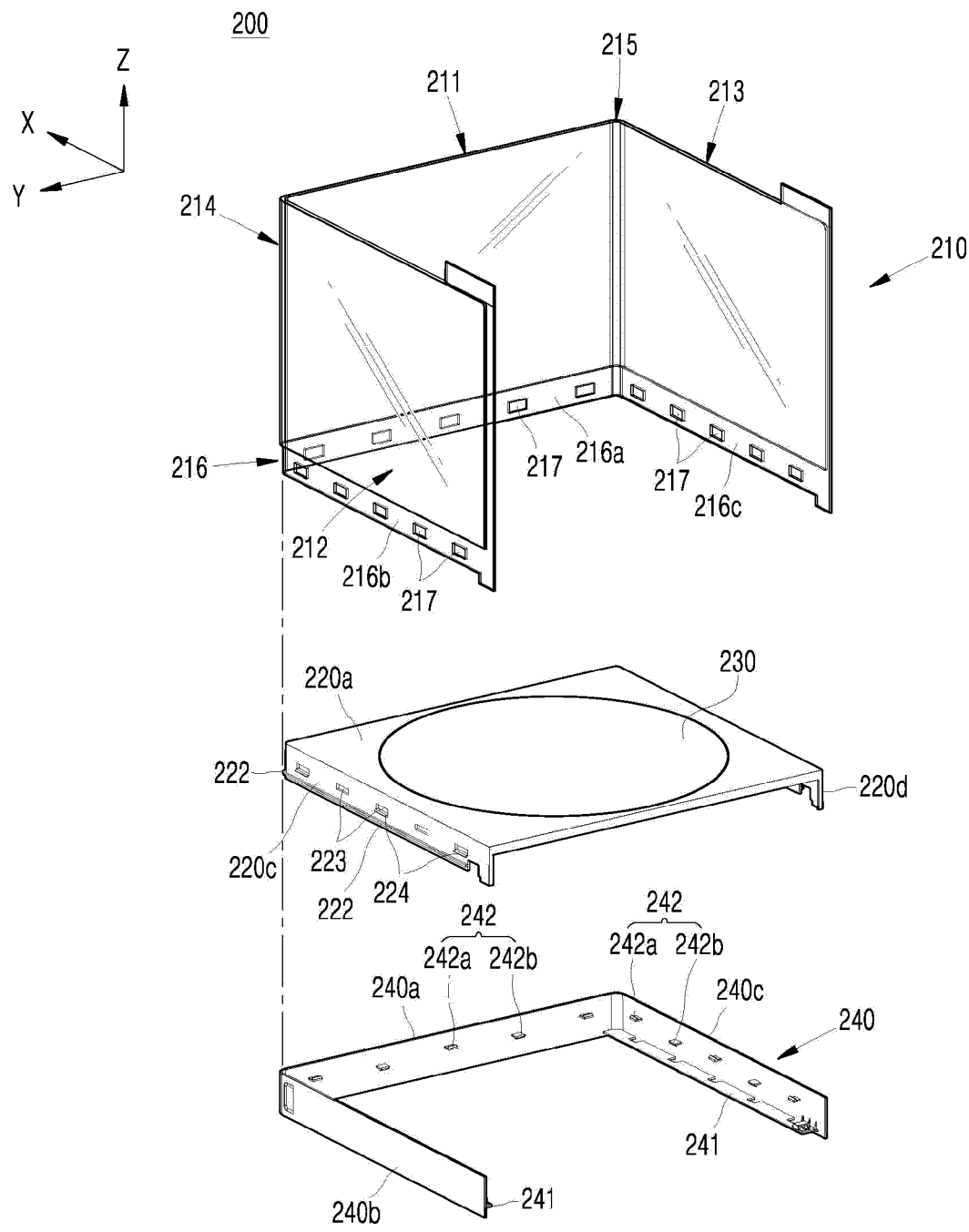


FIG. 5c

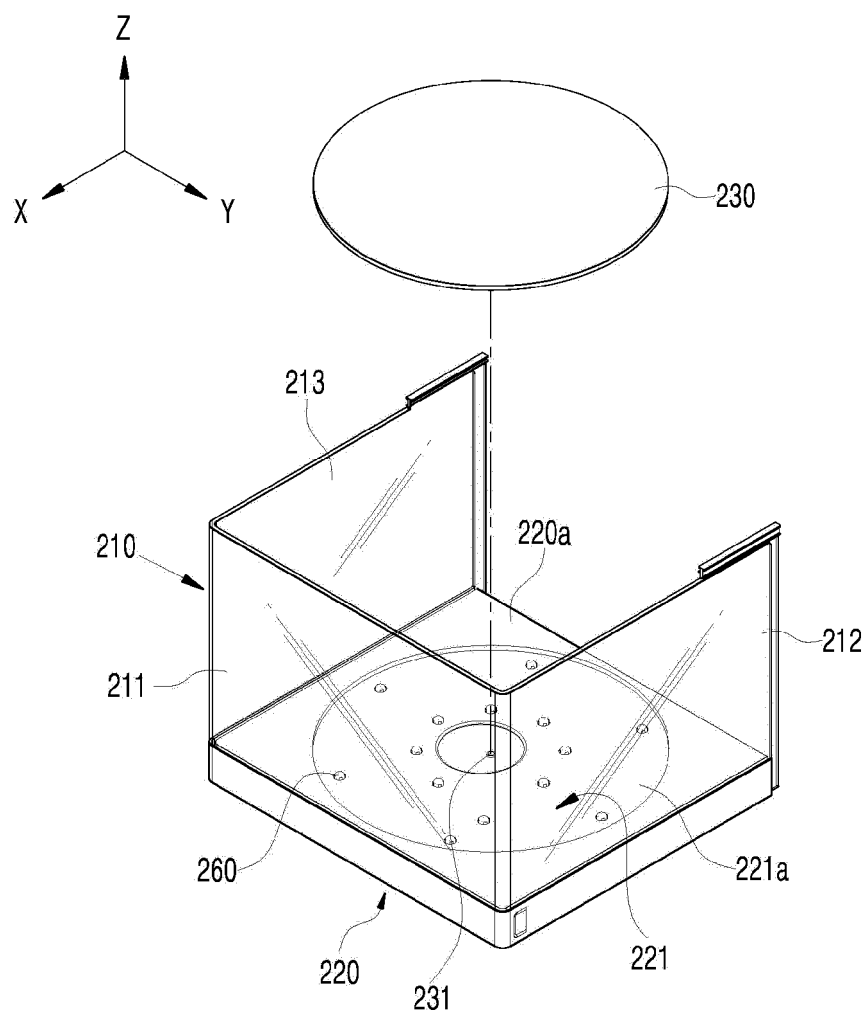


FIG. 6

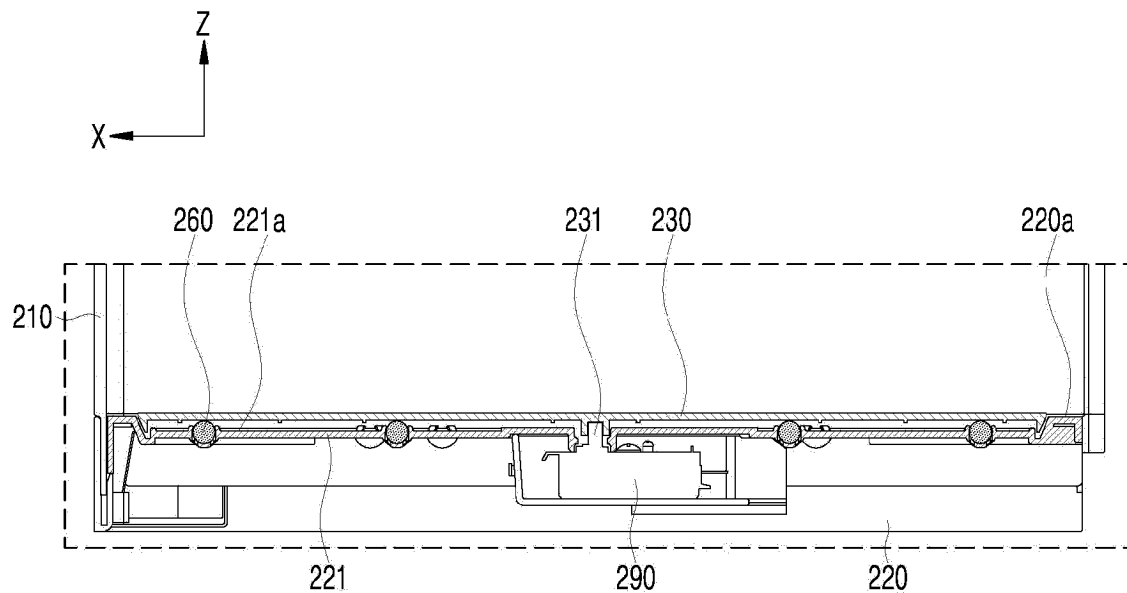


FIG. 7a

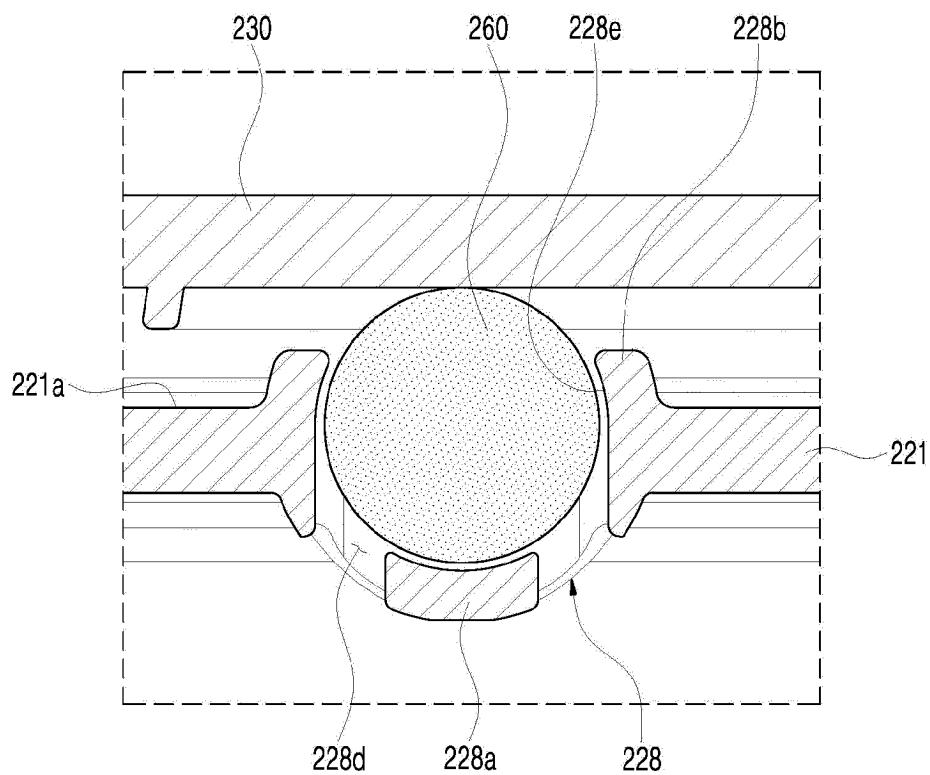


FIG. 7b

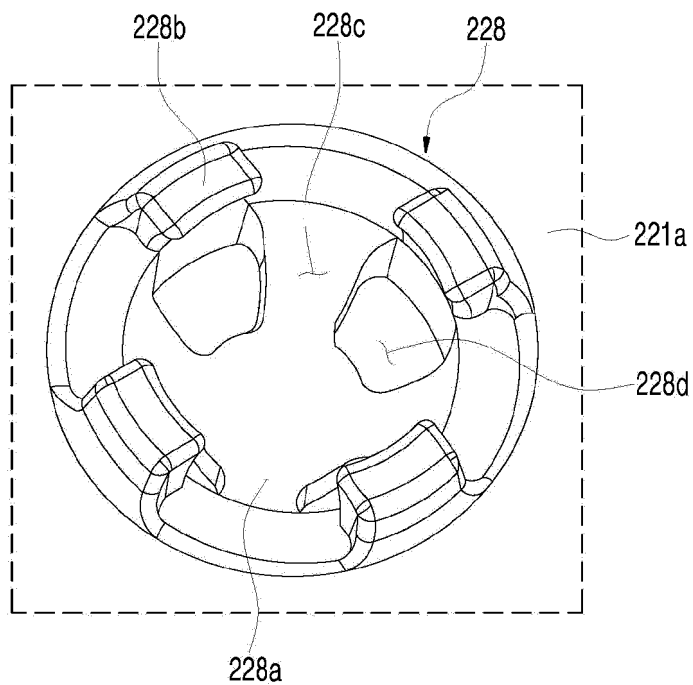


FIG. 7c

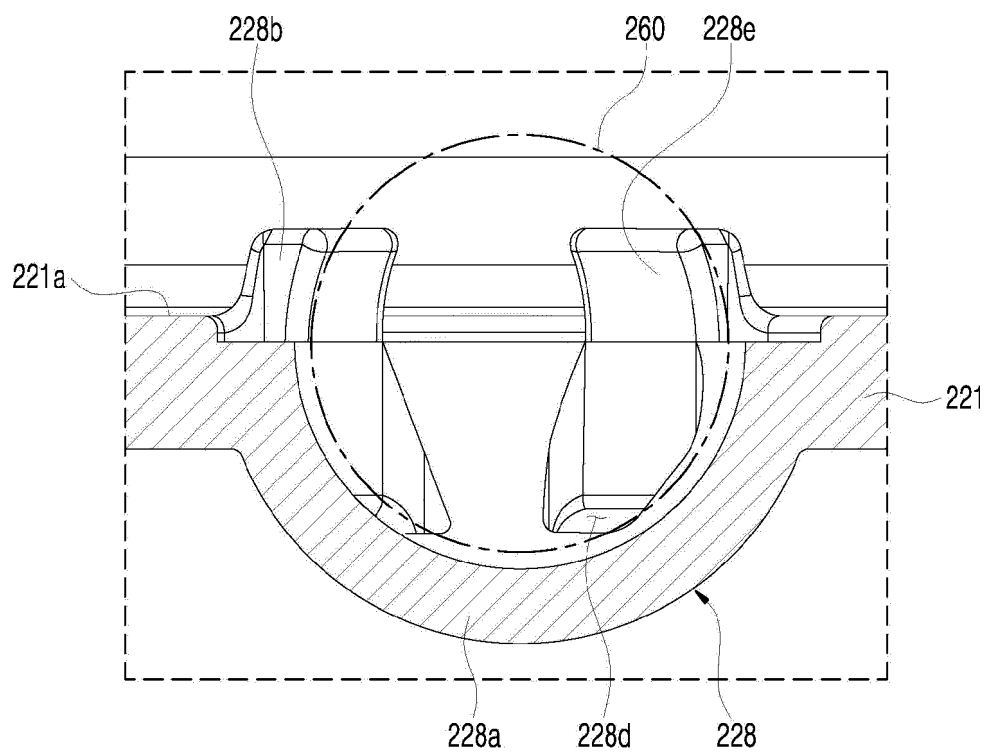


FIG. 8

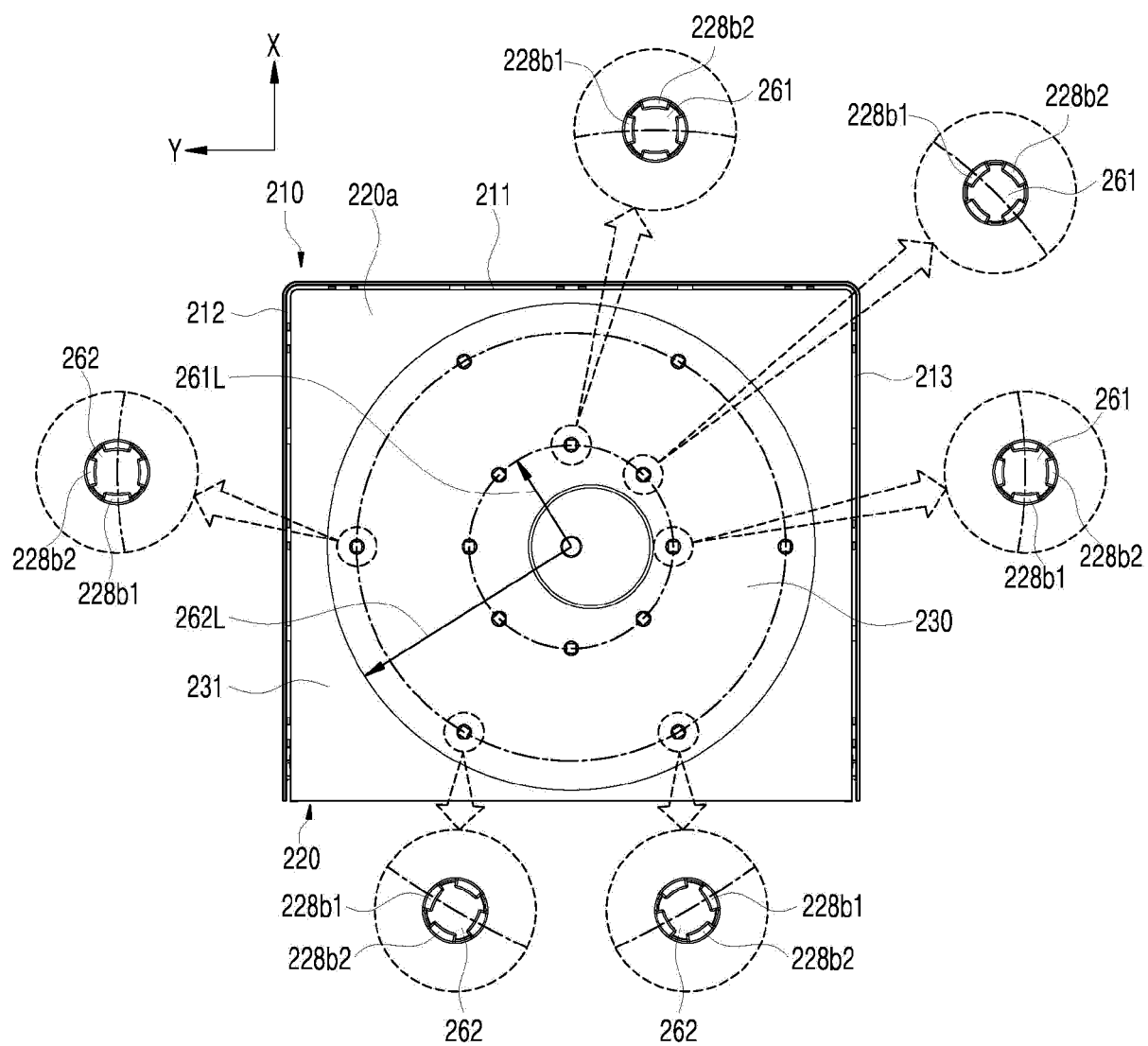


FIG. 9a

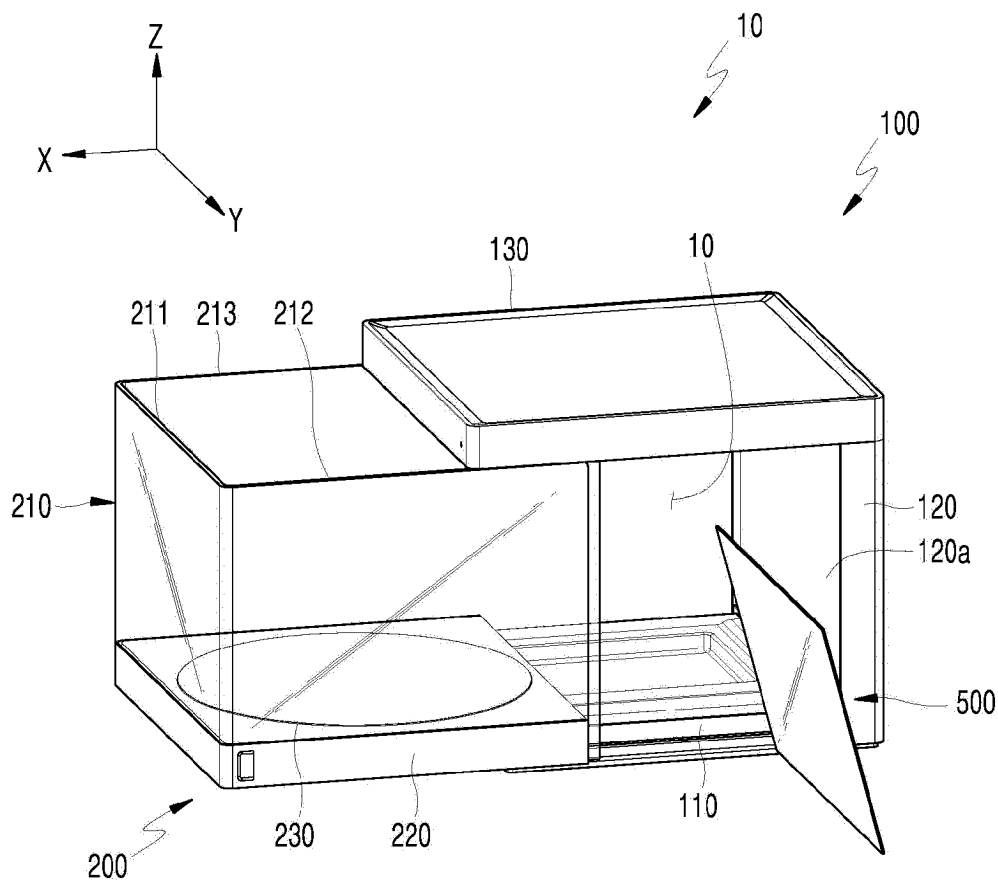


FIG. 9b

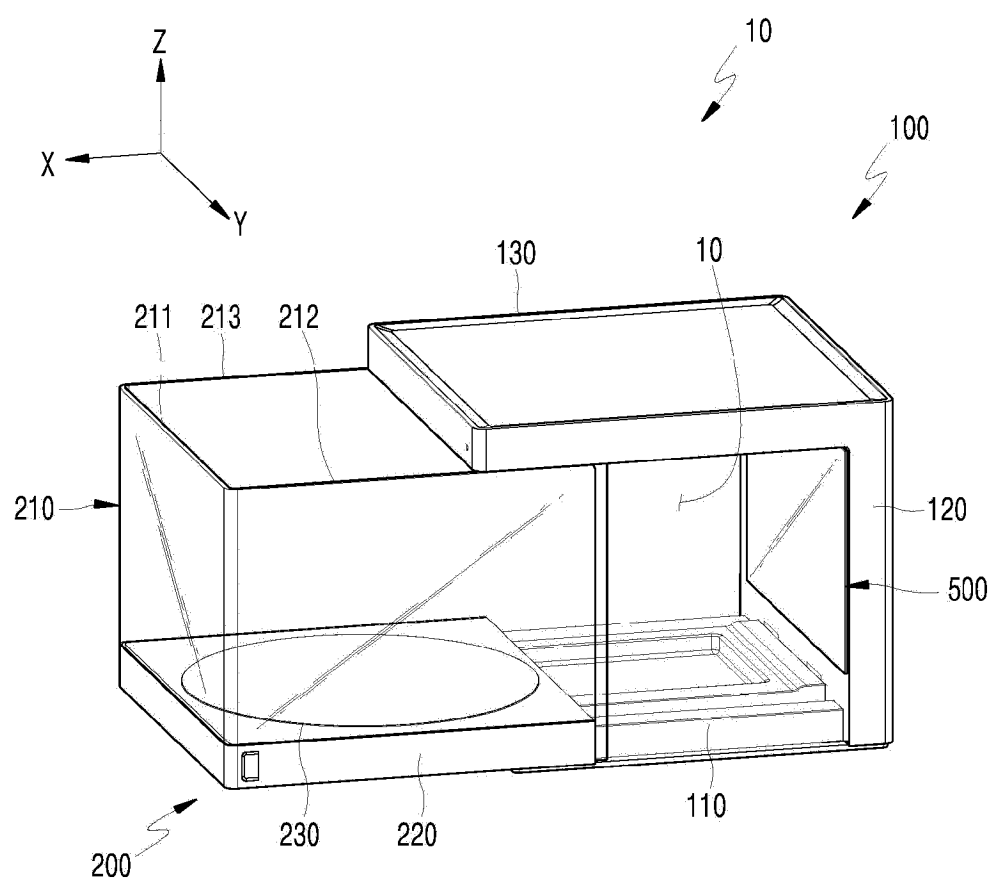


FIG. 10a

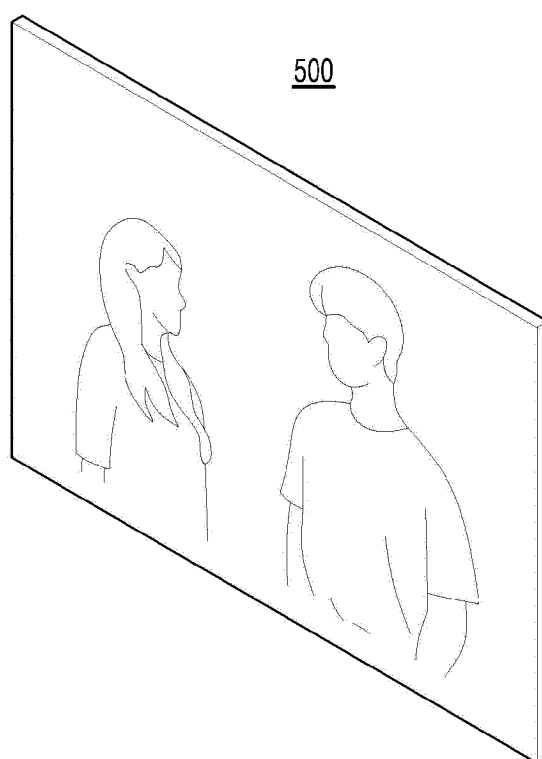


FIG. 10b

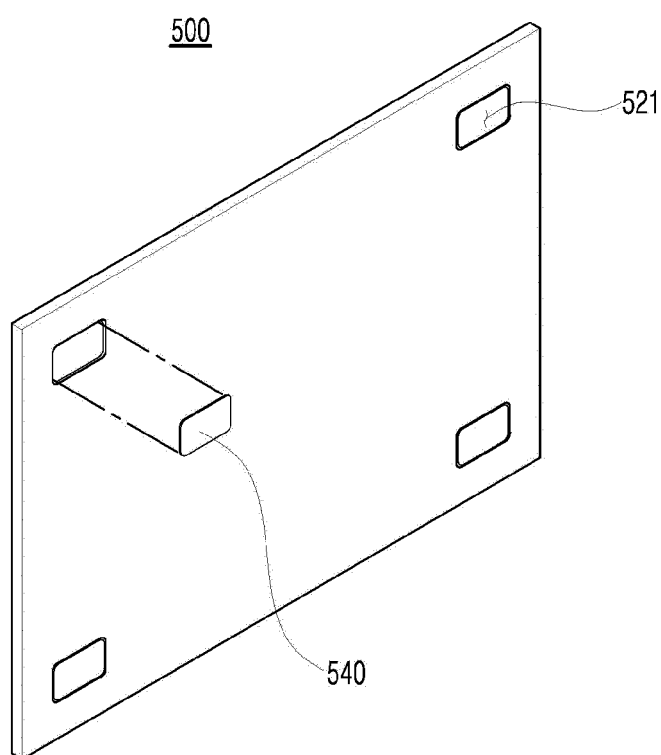


FIG. 11

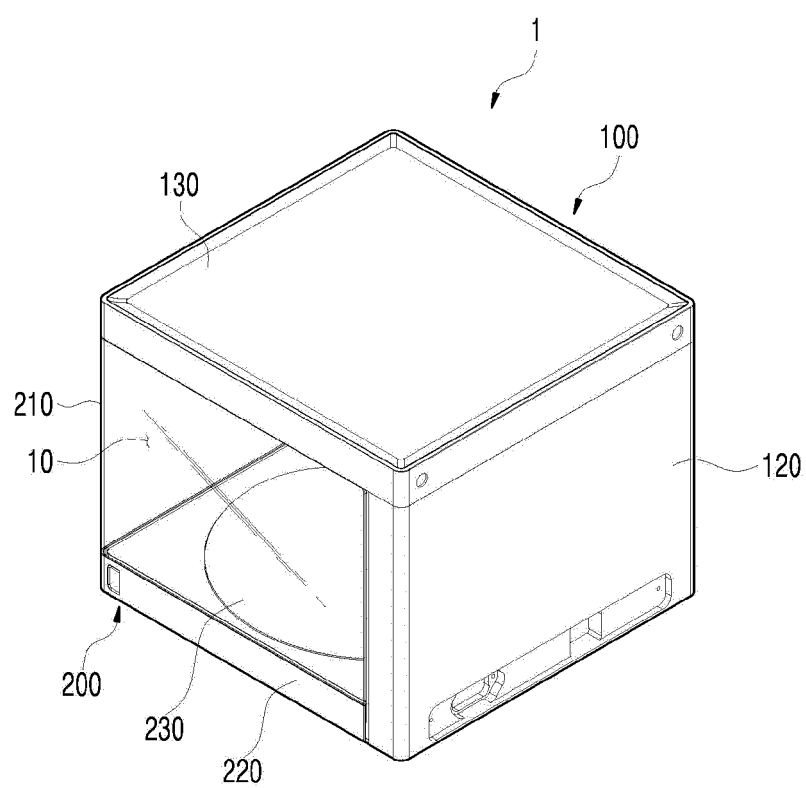


FIG. 12

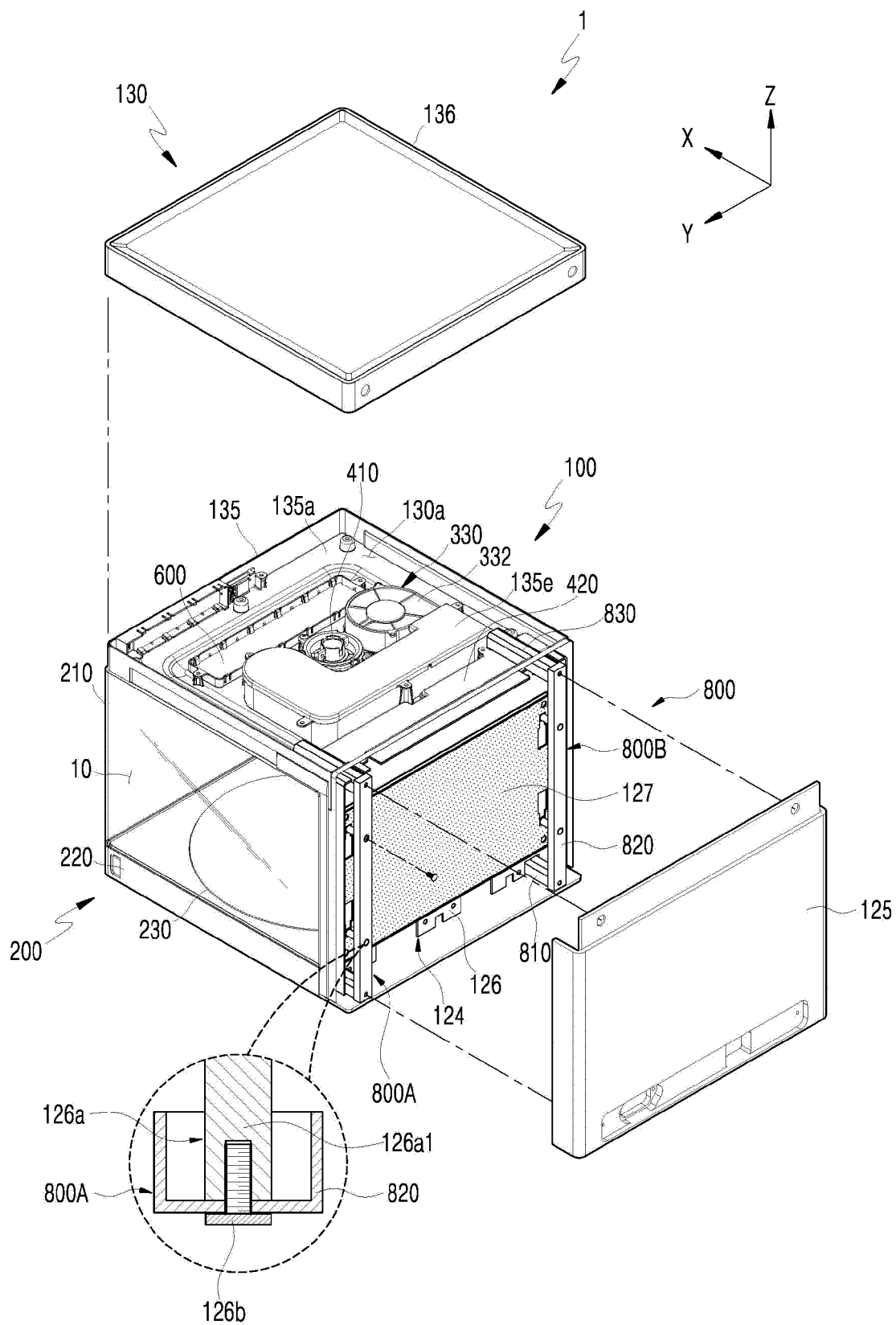


FIG. 13a

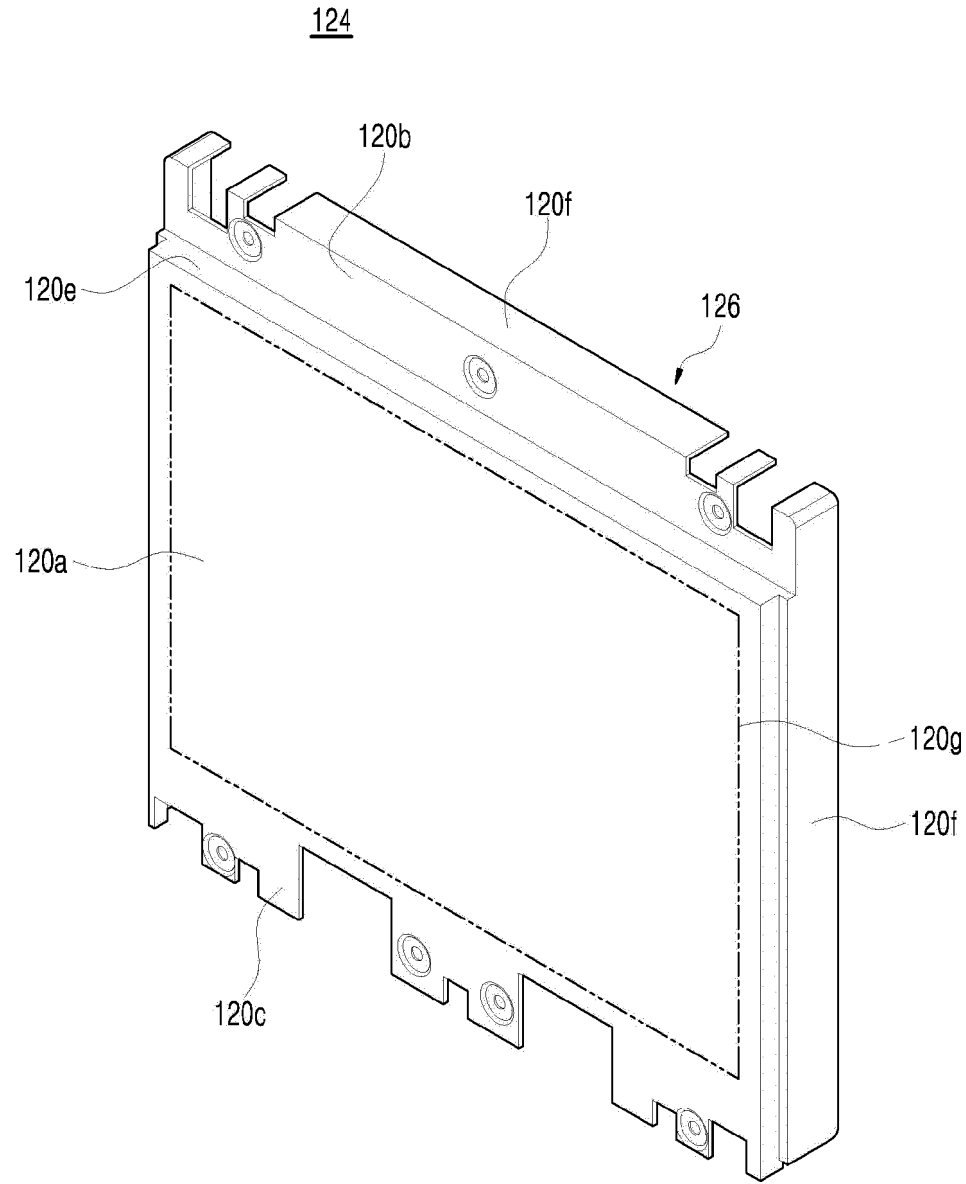


FIG. 13b

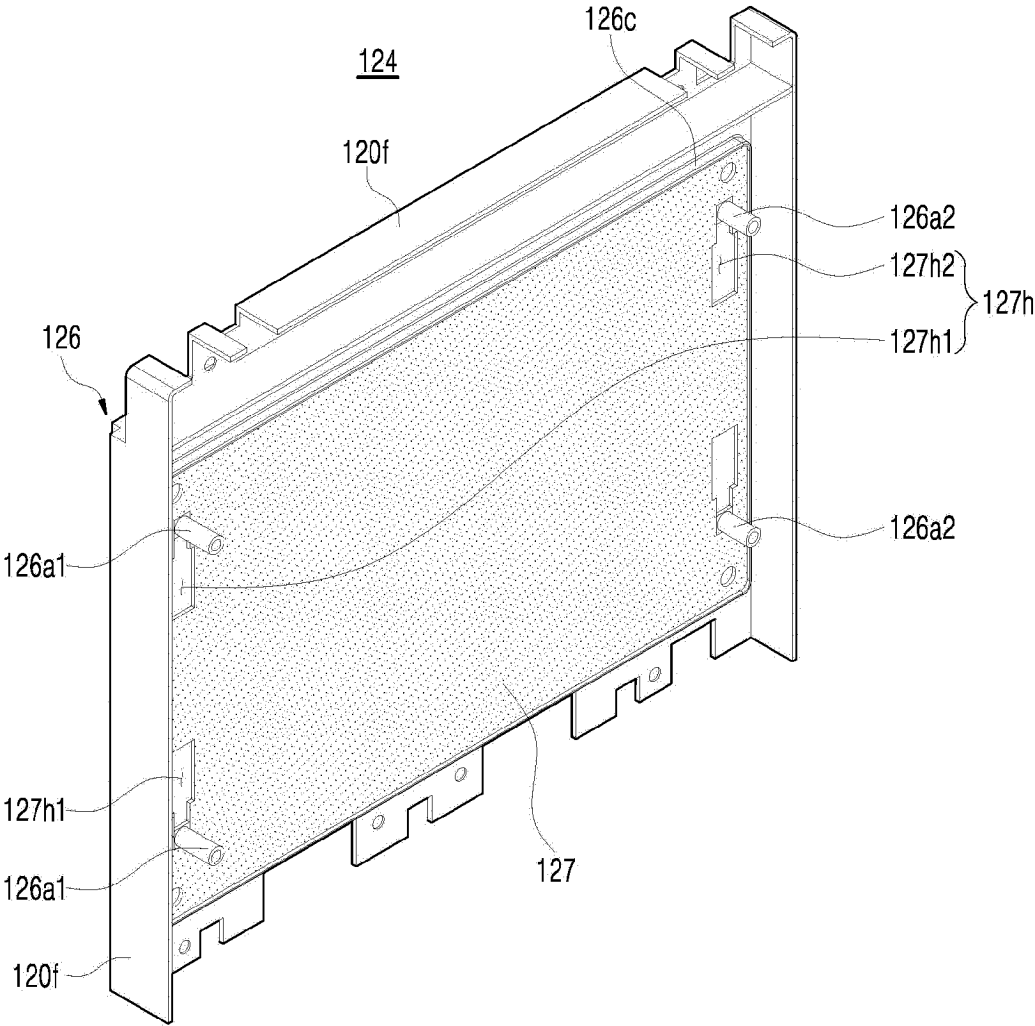
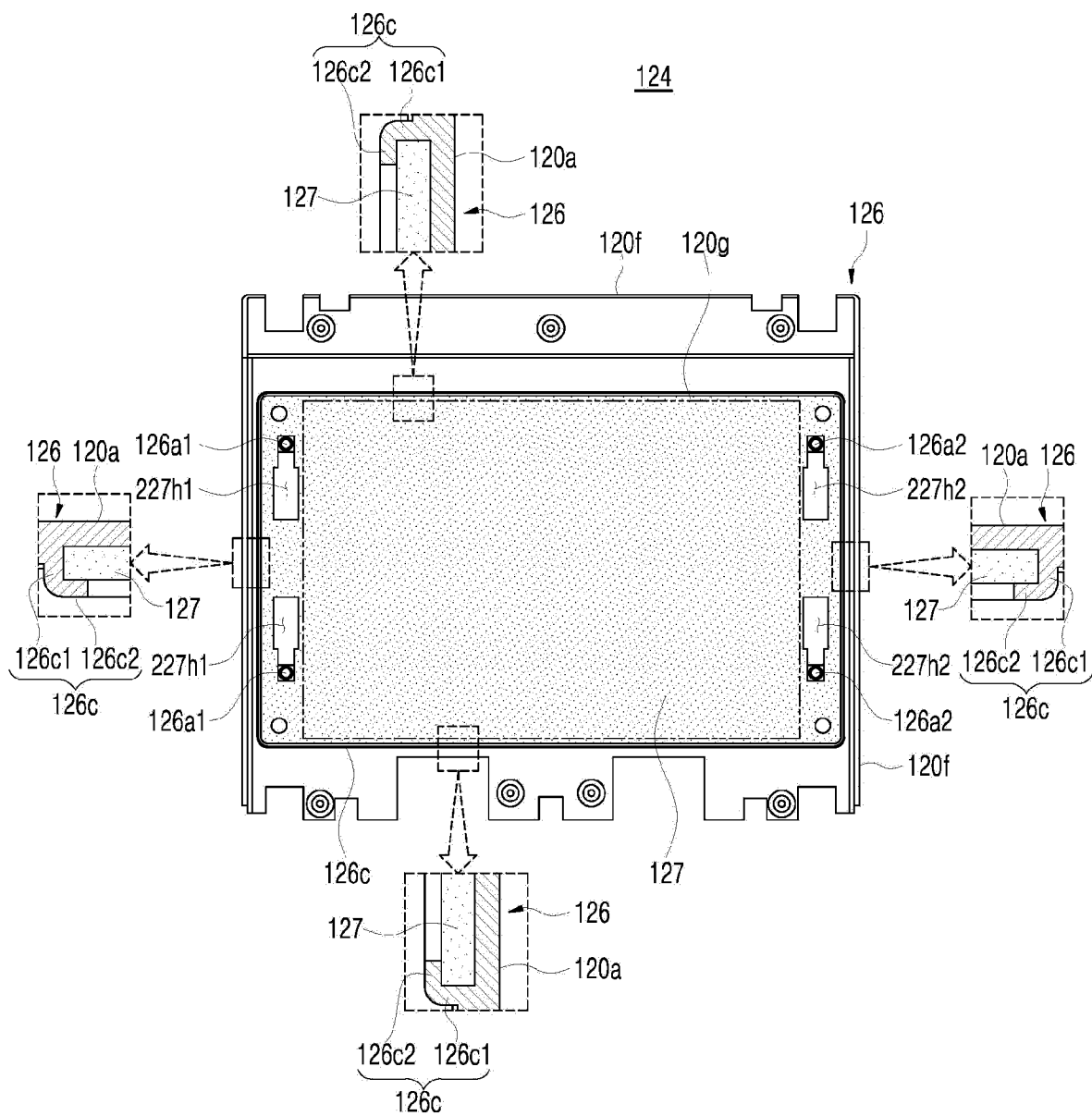


FIG. 13c



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/009619

A. CLASSIFICATION OF SUBJECT MATTER

A47F 5/025(2006.01)i; **A47F 3/00**(2006.01)i; **A47F 5/00**(2006.01)i; **A47B 95/00**(2006.01)i; **A47F 11/00**(2006.01)i;
A47B 61/04(2006.01)i; **A47L 23/20**(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47F 5/025(2006.01); A47F 3/08(2006.01); A47F 5/02(2006.01); A47F 5/03(2006.01); A47L 23/20(2006.01);
A61L 2/10(2006.01); B65D 21/02(2006.01); B65D 25/24(2006.01); F16M 11/20(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 신발 관리기(shoes care device), 이동체(moving object), 베이스(base), 턴테이블
(turntable), 회전볼(rotating ball)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2022-0118809 A (INDUSTRY-ACADEMIC COOPERATION FOUNDATION, HONAM UNIVERSITY) 26 August 2022 (2022-08-26) See paragraphs [0028]-[0039] and [0044] and figures 1-5.	1-9,12-13
A		10-11
Y	KR 10-2313831 B1 (KIM, Sung-Su) 18 October 2021 (2021-10-18) See paragraphs [0010] and [0035]-[0046] and figures 2-3, 9 and 11.	1-9,12-13
Y	US 2014-0291466 A1 (AMENDOLEA, Richard M.) 02 October 2014 (2014-10-02) See paragraph [0030] and figure 3.	2
A	US 2018-0127150 A1 (ADANUR et al.) 10 May 2018 (2018-05-10) See claims 1 and 3 and figures 1 and 10.	1-13

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

17 October 2023

Date of mailing of the international search report

17 October 2023

Name and mailing address of the ISA/KR

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Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/009619

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 202161046 U (LIANG, Yanguang) 14 March 2012 (2012-03-14) See claims 1-3 and figures 1-2.	1-13

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/009619

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
KR 10-2022-0118809 A	26 August 2022	KR 10-2463935 B1	03 November 2022
KR 10-2313831 B1	18 October 2021	None	
US 2014-0291466 A1	02 October 2014	US 9446744 B2	20 September 2016
US 2018-0127150 A1	10 May 2018	CA 2984523 A1	30 April 2018
CN 202161046 U	14 March 2012	None	

Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 20170130045 [0004]