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(54) **HOLOGRAPHIC SYSTEM FOR A CABINET**

(57) A cabinet (100) configured to be attached to and/or to be placed against a wall of a room, notably a kitchen, is described. The cabinet (100) comprises a slot (101) for receiving a handheld electronic device (150) having a display (151). Furthermore, the cabinet (100)

comprises a hologram plate (120) which is configured to generate a hologram (160) within a projection area (108), based on an image (301) which is rendered by the display (151) of the electronic device (150).

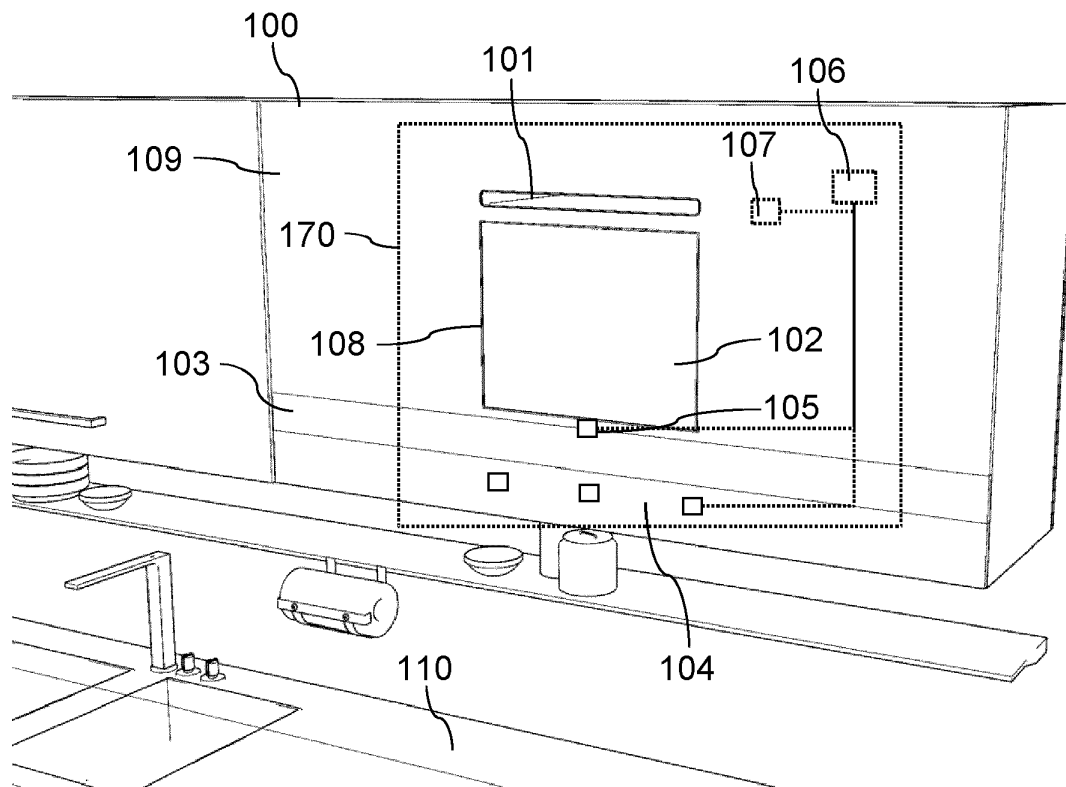


Fig. 1a

Description

[0001] The present document relates to an apparatus for generating a hologram, which is attachable to a cabinet, in particular a kitchen cabinet, and a corresponding cabinet.

[0002] An electronic device, such as a tablet PC or a smartphone, may be used within a household, notably within a kitchen, to provide support for a household task, such as cooking. By way of example, the user may use the electronic device to search for a recipe and to render, e.g., to display, cooking instructions from the recipe. During a cooking process, it may be difficult for the user to interact with the electronic device, as the user may have wet hands.

[0003] The present document addresses the technical problem of increasing the comfort of use of an electronic device within a household, in particular within a kitchen. The technical problem is solved by the independent claim. Preferred examples are described in the dependent claims.

[0004] According to an aspect of the invention, an apparatus is proposed, which is adapted to be fastened and/or attached to a side wall of a cabinet, preferably using screws. The apparatus comprises a frame, which encloses a slot for receiving a handheld electronic device having a display, and a hologram plate, which is configured to generate a hologram within a projection area, based on an image, which is rendered by the display of the electronic device. A control unit of the apparatus is configured to detect that an electronic device has been placed into the slot and in reaction to this establish a communication link with the electronic device.

[0005] The slot may be arranged within a display plane and the hologram plate may be arranged or configured to be arranged at a predetermined angle, preferably an angle between 35° and 55°, notably at 45°, with respect to the display plane, notably to allow for generating the hologram based on an image, which is rendered by the display of the electronic device, when the electronic device is located within the slot.

[0006] The hologram plate may be configured to be moved between a stored position, in which the hologram plate is parallel to the display plane, and a hologram position, in which the hologram plate is arranged at the predetermined angle with respect to the display plane.

[0007] The hologram plate may be attached to the frame preferably via one or more pivots allowing the hologram plate to be rotated around a rotational axis, which is arranged in parallel to the device plane.

[0008] The apparatus may comprise a gesture sensor, which is configured to sense gesture data regarding a gesture performed by a user within the projection area. The control unit is preferably configured to cause the electronic device, when it is placed within the slot, to be controlled based on the gesture data.

[0009] The apparatus may furthermore comprise one or more microphones, which are configured to capture

acoustic data regarding a voice control command of a user. Preferably the control unit is then configured to cause the electronic device, when it is placed within the slot, to be controlled based on the acoustic data.

[0010] In addition, the apparatus may comprise one or more speakers, wherein the control unit is preferably configured to receive an audio signal from an electronic device placed within the slot and cause the audio signal to be rendered by the one or more speakers.

[0011] The apparatus may furthermore comprise a charging element, notably a charging coil, configured to charge the electronic device, when it is placed within the slot.

[0012] Like already mentioned, this apparatus is adapted to be fastened and/or attached to a side wall of a cabinet. Therefore, according to a further aspect, a cabinet which may be configured to be attached to and/or to be placed against a wall of a room, in particular a kitchen, is described. The cabinet may be a kitchen cabinet, notably a hanging kitchen cabinet and/or a kitchen cabinet of a fitted kitchen. The cabinet may have the form of a cuboid. The cabinet may comprise side walls which may form a rectangular frame. The side walls of the cabinet may extend away from the wall that the cabinet is attached to and/or placed against. In particular, the side walls of the cabinet may be perpendicular to the wall that the cabinet is attached to and/or placed against. Furthermore, the cabinet may comprise a front panel which may cover the rectangular frame formed by the side walls of the cabinet. The front panel may be parallel to the wall that the cabinet is attached to and/or placed against. The cabinet may have a width of 20cm or more, a height of 20cm or more and/or a depth of 20cm or more. The side walls and/or the front panel of the cabinet may comprise wood. In particular the side walls and/or the front panel may be formed using fibreboard, notably medium-density fibreboard (MDF), and/or (plain) wood.

[0013] The cabinet and/or the built-in apparatus comprises a slot for receiving a handheld electronic device (such as a tablet PC or a smartphone) having a display. The slot may be dimensioned for an electronic device having a display size for 5 inches or more and/or of 15 inches or less. Furthermore, the slot may be dimensioned for electronic devices having a width (perpendicular to the display) of 15mm or less. The slot may extend from the front panel towards the backside of the cabinet (which is intended to touch the wall that the cabinet is attached to or is placed against).

[0014] Furthermore, the cabinet and/or the built-in apparatus comprises a hologram plate which is configured to generate a hologram within a projection area, based on an image which is rendered by the display of the electronic device. The hologram plate may also be referred to as a holographic plate. The hologram plate may be configured to generate the hologram in a projection area at the far side of the hologram plate with respect to the location of the slot (and by consequence the location of the display with the image that is represented by the holo-

gram). The projection area may be located within the cabinet or in the direct vicinity of the cabinet (e.g., directly in front of the front panel or directly above or below a side wall of the cabinet).

[0015] Hence, a cabinet is described which comprises a built-in holographic system for projecting the content displayed on the display of an electronic device that has been placed into the slot of the cabinet. By doing this, the interaction of a user with the electronic device may be improved, notably when cooking.

[0016] As already indicated above, the cabinet may comprise a front panel which is intended to face a user of the cabinet. The front panel may be turned away from the wall that the cabinet is attached to and/or placed against. Furthermore, the front panel may delimit the interior of the cabinet (which is, e.g., used for storing food items, cooking equipment or dishes). The slot may extend from the front panel towards the backside of the cabinet and/or into the interior of the cabinet. By doing this, the electronic device may be stored in a place-efficient and safe manner.

[0017] The hologram plate may be located within the interior of the cabinet adjacent, notably above or below, the slot. The hologram plate may be arranged such that the projection area is aligned with the front panel of the cabinet, thereby enabling a particularly comfortable interaction with the electronic device which is placed within the slot.

[0018] The cabinet and/or the built-in apparatus may comprise a movable cover which is configured to cover the hologram plate and which is configured to be moved away to give access to the hologram plate (and thereby allowing the hologram to be projected). A control unit of the cabinet and/or the built-in apparatus may be configured to detect that the cover has been moved away to give access to the hologram plate. For this purpose, the cabinet and/or the built-in apparatus may comprise a sensor which is configured to detect that the cover has been moved away. In reaction to detecting that the cover has been moved away, the electronic device may be controlled by the control unit to display an image on the display for generating the hologram. As a result of this, the comfort of use of a user may be increased further.

[0019] The movable cover may be aligned with the front panel when the cover covers the hologram plate. In particular, the front panel and the cover may form a flat surface, when the cover covers the hologram plate. By providing a cover for covering the hologram plate, the robustness of the cabinet can be increased.

[0020] The moveable cover may be configured to be slid behind or in front of the front panel for giving access to the hologram plate. By enabling a sliding movement of the cover, the comfort of use of a user may be further increased.

[0021] The projection area for the hologram may be located at the location where the cover is located when the cover covers the hologram plate. By doing this, the hologram may be aligned with the front panel for allowing

the user to view the hologram in a comfortable manner.

[0022] As already indicated above, the cabinet may comprise a side wall which extends away from the wall that the cabinet is attached to and/or placed against. In particular, the cabinet may comprise a lower side wall and an upper side wall which are arranged parallel to the ground that the cabinet is standing on or is aligned to. Furthermore, the cabinet may comprise perpendicular side walls which are arranged perpendicular to the ground that the cabinet is standing on or is aligned to.

[0023] The cabinet and/or the built-in apparatus may comprise a frame which is attached to a side wall of the cabinet (notably the lower side wall or the upper side wall) and which encloses the slot for the electronic device. Hence, the slot may be located outside of the cabinet. As a result of this, the interior of the cabinet may entirely be used for storing goods.

[0024] The hologram plate may be rotatably attached to the frame (e.g., using one or more pivots) such that the hologram plate can be arranged in a stored position, where the hologram plate is parallel to the side wall, or in a hologram position, where the hologram plate extends away from the side wall at a predetermined angle (e.g., between 35° and 55°, notably at 45°) for generating the hologram. By providing a hologram plate that can be moved between a hologram position and a stored position, a particularly compact holographic system may be provided, wherein the hologram plate is used to form a hologram from the image that is displayed on the screen of the electronic device, which is located within the slot.

[0025] The control unit of the cabinet and/or the built-in apparatus may be configured to detect that the hologram plate has been moved to the hologram position. In reaction to this, the electronic device which is placed within the slot may be controlled by the control unit to display an image on the display for generating the hologram. On the other hand, the control unit may be configured to detect that the hologram plate has been moved to the stored position. In reaction to this, the electronic device may be controlled by the control unit to stop displaying images on the display. As a result of this, a comfortable and power efficient interaction with the electronic device is enabled.

[0026] The slot may be such that the display of the electronic device, which is located within the slot is arranged within a display plane (with the display facing the hologram plate). The hologram plate may be arranged or may be configured to be arranged at a predetermined angle, preferably between 35° and 55°, notably at 45°, with respect to the display plane, for generating the hologram based on the image, which is rendered by the display of the electronic device. As a result of this, a hologram may be generated in an efficient and reliable manner.

[0027] The display plane may be perpendicular to the wall that the cabinet is attached to and/or placed against. Furthermore, the display plane may be parallel to the ground that the cabinet is standing on and/or is aligned to. Alternatively, or in addition, the display plane may be

parallel to a side wall (notably the lower side wall or the upper side wall) of the cabinet. Furthermore, the display plane may be perpendicular to the front panel of the cabinet. As a result of this, the electronic device may be placed within or onto the cabinet in a compact and safe manner. In addition, the hologram may be generated within a projection area, which may be viewed by a user in a comfortable manner.

[0028] As indicated above, the hologram plate may be configured to be moved between a stored position, where the hologram plate is substantially parallel to the display plane, and a hologram position, where the hologram plate is arranged at the predetermined angle with respect to the display plane. For this purpose, the hologram plate may be attached to the cabinet and/or the built-in apparatus, notably to the frame enclosing the slot for the electronic device, via one or more pivots allowing the hologram plate to be rotated around a rotational axis, which is arranged in parallel to the device plane. By doing this, a particularly compact holographic system may be provided.

[0029] As indicated above, the cabinet and/or the built-in apparatus may comprise a control unit (e.g., a micro-processor). The control unit may be configured to detect that an electronic device has been placed into the slot of the cabinet. Furthermore, the control unit may be configured, in reaction to this, to establish a (wireline or wireless) communication link with the electronic device, e.g. via Bluetooth. Hence, an automatic docking process may be performed, when an electronic device is slid into the slot, thereby increasing the comfort for a user of the cabinet.

[0030] The communication link between the electronic device and the control unit of the cabinet may be used to exchanging data. In particular, the control unit may be enabled to control the electronic device via the communication link. Alternatively, or in addition, the communication link may be used to provide data (e.g., audio data) from the electronic device to the control unit.

[0031] The cabinet and/or the built-in apparatus may comprise a gesture sensor, notably at the front panel of the cabinet, which is configured to sense gesture data regarding a gesture performed by a user, notably a gesture within the projection area. The control unit may be configured to cause the electronic device, which is placed within the slot, to be controlled based on the gesture data (via the communication link). Hence, the user may be enabled to interact with the hologram using gestures, thereby increasing the comfort of use for the user.

[0032] Alternatively, or in addition, the cabinet and/or the built-in apparatus may comprise one or more microphones, notably at the front panel of the cabinet, configured to capture acoustic data regarding a voice control command of a user of the cabinet. The control unit may be configured to cause the electronic device, which is placed within the slot, to be controlled based on the acoustic data (via the communication link), thereby allowing the user to interact with the electronic device in a

comfortable manner.

[0033] The cabinet and/or the built-in apparatus may comprise one or more speakers, notably at the front panel of the cabinet. The control unit may be configured to receive an audio signal from an electronic device placed within the slot of the cabinet (via the communication link). Furthermore, the control unit may be configured to cause the audio signal to be rendered by the one or more speakers. Hence, the cabinet may be configured to provide the acoustic output of the electronic device, thereby further improving the user interaction with the electronic device.

[0034] The cabinet and/or the built-in apparatus may comprise a charging element, notably a charging coil, configured to charge the electronic device which is placed within the slot of the cabinet. The charging element may be configured to perform wireless charging of the electronic device, thereby increasing the comfort of use of the cabinet.

[0035] The cabinet and/or the built-in apparatus may comprise a power supply which is configured to supply the different components of the cabinet (notably the one or more speakers, the control unit, the gesture sensor, the charging element, etc.) with electrical energy.

[0036] The above described apparatus may be sold separately (as a stand-alone device) and may be combined with a conventional cabinet to practice the invention. For example, the user himself may want to buy such a stand-alone device and screw it to the lower side wall of one of his conventional cabinets in the kitchen. Therefore, as already mentioned, the invention may comprise the apparatus, which is adapted to be fastened and/or attached to a side wall of a cabinet, preferably using screws. Said apparatus may comprise the mentioned frame, which encloses a slot for receiving a handheld electronic device having a display, and the described hologram plate, which is configured to generate a hologram within a projection area, based on an image, which is rendered by the display of the electronic device.

[0037] It should be noted that the methods, cabinets, apparatuses and systems including their preferred embodiments as outlined in the present document may be used stand-alone or in combination with the other methods, cabinets, apparatuses and systems disclosed in this document. In addition, the features outlined in the context of a system are also applicable to a corresponding method. Furthermore, all aspects of the methods and systems outlined in the present document may be arbitrarily combined. In particular, the features of the claims may be combined with one another in an arbitrary manner. This means especially that the features disclosed with regard to the cabinet may be applied analogously to the apparatus and vice versa. Thus, for example, the described control unit, the gesture sensor, the one or more microphones, the one or more speakers, the charging element and the power supply may be parts of the mentioned apparatus and/or of the described cabinet.

[0038] The invention is explained below in an exemplary manner with reference to the accompanying draw-

ings, wherein

Figures 1a to 1f show a first example of a cabinet with a built-in apparatus, which may also be called docking station in the following;

Figures 2a to 2f show a second example of a cabinet with a built-in docking station; and

Figure 3 shows an example holographic system.

[0039] As outlined above, the present document is directed at increasing the comfort of use of an electronic device, such as a tablet PC or a smartphone, within a household, in particular within a kitchen. In this context, Figures 1a to 1f illustrate a first example of a cabinet 100, in particular a kitchen cabinet, which comprises a built-in docking station 170 for an electronic device 150. The cabinet 100 may be configured to be attached to a wall above a kitchen worktop 110. The docking station 170 is configured to provide a user interface for an electronic device 150, which is placed within the docking station 170. In particular, the docking station 170 may be configured to render the content on the screen 151 of the electronic device 150 using a hologram 160. For this purpose, the docking station 170 comprises a holographic system 300 as shown in Fig. 3.

[0040] Fig. 3 shows a block diagram of the different components of a holographic system 300 from the side. The holographic system 300 comprises a display 151, which may be the display 151 of the electronic device 150. The display 151 may be configured to display an image 301 (e.g., an image from a video signal provided by the electronic device 150). The image 301 may be projected onto a 3D hologram plate 120 (also referred to as a holographic plate) using a lens plate 302 (for resizing the image 301). The lens plate 302 and the display 151 may be arranged at a defined angle 303 with respect to the 3D hologram plate 120 (notably an angle of 45°). The 3D hologram plate 120 may be configured to generate the hologram 160 based on the resized image 301 (e.g., using refraction). The hologram 160 may be generated at an angle of 90° with respect to the display plane of the display 151.

[0041] As shown in Fig. 1a, the cabinet 100 and/or the built-in apparatus may comprise a slot 101, into which the electronic device 150 may be placed. The slot 101 may be positioned adjacent to (e.g., above or below) the projection area 108 of the cabinet 100, within which the hologram 160 is to be projected. The projection area 108 may be covered by a movable front cover 102, when the holographic system 300 is not used.

[0042] The cabinet 100, in particular the docking station 170 and/or the built-in apparatus, may comprise a (wireline and/or wireless) communication interface 107 for interacting with the electronic device 150 that is placed within the slot 101 of the cabinet 100. The communication interface 107 may e.g., comprise a USB interface. Alternatively, or in addition, the communication interface 107 may comprise a Bluetooth or a WLAN interface.

[0043] The docking station 170 (the built-in apparatus) may be configured to exchange data with the electronic device 150 via a communication link provided by the communication interface 107.

[0044] Furthermore, the cabinet 100, in particular the built-in docking station 170, may comprise one or more control elements, which enable a user to control the electronic device 150. In particular, the cabinet 100 and/or the built-in apparatus may comprise a gesture sensor 105 configured to sense gesture data regarding a gesture, e.g., a hand gesture, which is performed by a user in front of the cabinet 100 and/or within the projection area 108. Alternatively, or in addition, the cabinet 100 and/or the built-in apparatus may comprise one or more microphones 104, e.g., a microphone array, configured to sense acoustic data regarding a voice control of the user of the electronic device 150. The gesture sensor 105 and/or the one or more microphones 104 may be placed at the front panel 109 of the cabinet 100, which is facing the user of the cabinet 100.

[0045] A control unit 106 of the cabinet 100, in particular of the built-in docking station 170 (the built-in apparatus), may be configured to process the gesture data and/or the acoustic data, in order to enable gesture control and/or voice control of the electronic device 150 based on the gesture data and/or the acoustic data. By way of example, the control unit 106 may be configured to send the gesture data and/or the acoustic data (or processed versions of the gesture data and/or the acoustic data) to the electronic device 105 via the communication link provided by the communication interface 107.

[0046] In addition, the cabinet 100, in particular the built-in docking station 170, may comprise one or more speakers 103, notably loudspeakers, which are configured to render an audio signal that is provided by the electronic device 150. The audio signal may be provided to the control unit 106 via the communication interface 107. Furthermore, the control unit 106 may control rendering of the audio signal using the one or more speakers 103. The speakers 103 may be placed at the front panel 109 of the cabinet 100, which is facing the user of the cabinet 100.

[0047] Fig. 1a comprises a perspective view of the cabinet 100 with the built-in docking station 170. Fig. 1b shows a front view of the cabinet 100. Fig. 1c shows a perspective view of the interior of the cabinet 100, in particular of the projection area 108 of the cabinet 100 behind or at the movable cover 102. It can be seen that the hologram plate 120 is arranged at a defined angle 303 with respect to the slot 101 for the electronic device 150.

[0048] As can be seen in Fig. 1c, the slot 101 may comprise a charging element 121, notably a charging coil, which is configured to charge the electronic device 150 which is placed within the slot 101. The charging element 121 may be configured for wired charging (e.g., using a USB interface) and/or for wireless charging (e.g., using a charging coil).

[0049] Fig. 1d illustrates how a user may slide away

the movable cover 102 with his hand 131. By way of example, the movable panel 102 may be pushed inwards into the cabinet 100 and may then be slid down to give access to the projector area 108 and/or to the hologram plate 120. By making use of a movable cover 102 for covering the projector area 108, and in particular the hologram plate 120, the holographic system 300 may be protected from damage and soiling.

[0050] Fig. 1e illustrates how a user may push an electronic device 150 into the slot 101, with the display 151 of the electronic device 150 facing the hologram plate 120. Once the electronic device 150 is placed within the slot 101, the electronic device 105 may be coupled with the built-in docking station 170 of the cabinet 100. In particular, communication between the electronic device 150 and the control unit 106 of the docking station 170 may be established via the communication interface 107.

[0051] Once the electronic device 150 has been coupled with the built-in docking station 170, the user may be enabled to interact with the electronic device 150, e.g., using gestures (as illustrated in Fig. 1f). Furthermore, the holographic system 300 may be used to generate a hologram 160 using an image 301, which is rendered on the display 151 of the electronic device 150. The hologram 160 may be projected in a projection area 108 within or in front of the cabinet 100.

[0052] Figures 1a to 1f show an example cabinet 100 with a slot 101, which is integrated into the front panel 109 of the cabinet 100. Figures 2a to 2f show an example cabinet 100 with a slot 101 which is attached to a side wall 209, in particular to the lower side wall 209, of the cabinet 100. In particular, a frame 201 forming the slot 101 for the device 150 may be attached to a side wall 209 of the cabinet 100. The hologram plate 120 may be attached to the frame 201 via a pivot 202, which allows the hologram plate 120 to be moved from a stored position (with the hologram plate 120 being parallel to the slot 101, as shown in Fig. 2a) to a hologram position (with the hologram plate 102 being placed at the defined angle 303 with respect to the slot 101, as shown in Fig. 2b).

[0053] As shown in Fig. 2c, a user may slide an electronic device 150 into the slot 101 with the display 151 facing the hologram plate 120. The user may then move the hologram plate 120 from the stored position to the hologram position, such that a hologram 160 may be projected within the projection area 108 adjacent to the side wall 209 of the cabinet 100 (as shown in Fig. 2e). Fig. 2f shows an example charging element 121 which is integrated within the slot 101.

[0054] Hence, the integration of consumer electronics into the kitchen interior is described. In particular, a kitchen cabinet 100 with a built-in smart speaker 170 with a holographic system 300 is described. The cabinet 100 may comprise an integrated smart speaker 170, a hologram 3D plate 120, a gesture sensor 105 and/or a microphone array 104. The user may use a hologram 160 for displaying information from an electronic device 150. Furthermore, the user may interface with the electronic

device 150, notably with the displayed information, through voice and/or gesture. The user may place an electronic device 150 such as a tablet PC or any smart device in the slot 101 provided above or below the projection area 108 of the cabinet 100. Furthermore, the user may push away the front cover 102 of the projection area 108, thereby revealing the hologram plate 120 in the background. In addition, interaction with the hologram 160 may be enabled through gesture or voice.

[0055] As outlined above, the cabinet 100 and/or the built-in apparatus may comprise a built-in speaker 103, a gesture sensor 105, a microphone array 104, a hologram plate 120, a wireless charging coil 121 and/or a slot 101 for placing the electronic device 150.

[0056] The hologram plate 120 may be hidden behind the front panel 109 of the cabinet 100 (as shown in Fig. 1c). The slot 101 may comprise an induction charging coil 121 for the electronic device 150. The speaker 103, the microphone array 104 and/or the gesture sensor 105 may be integrated into the cabinet 100 and/or the built-in apparatus and may extend towards the backside of the cabinet 100.

[0057] As shown in Fig. 1d, a user may touch the movable cover 102, which pushes back and slides behind the front panel 109 of the cabinet 100. This exposes the hologram plate 120 which is configured to generate a floating hologram 160 in front the front panel 109 of the cabinet 100.

[0058] As shown in Fig. 1e, the user may place the electronic device 150 into the slot 101 which auto-docks or connects to the built-in docking station 170. Furthermore, the device 150 may be configured to automatically switch on the built-in docking station 170. The electronic device 150 is placed into the slot 101 with the screen facing (downwards) towards the inclined hologram plate 120.

[0059] As soon as the electronic device 150 is placed inside the cabinet slot 101, the hologram 160 may appear in front of the panel 109 and may replicate the content, which is displayed on the screen 151 of the electronic device 150. The user may interact with the content of the hologram 160 using the integrated gesture sensor 105 (which may be located next to the speaker grill) and/or using voice control via the microphone array 104 placed in front of the cabinet 100.

[0060] In the example shown in Figures 2a to 2f, the slot 101 for the electronic device 150 is attached under the cabinet 100. The slot 101 may be provided by a frame or a box 201, which is attached under the cabinet 100. The box 201 may comprise a wireless charging coil 121. The user may place the electronic device 150 in the slot 101 with the screen 151 facing downwards. The hologram plate 120 may be located below the slot 101. The hologram plate 120 may be configured to be rotated around a horizontal axis, in order to move the hologram plate 120 from the stored position into the hologram position.

[0061] Upon insertion of the electronic device 150 into

the slot 101, the electronic device 150 may automatically connect to the docking station 170. Furthermore, the user may rotate the hologram plate 120 into the hologram position. The angle 303 of the hologram plate 120 may be adjusted according to the height and/or visibility requirements of the user. The user may then interact with the floating hologram 160 through gesture and/or voice interaction using the integrated microphone array 104 and/or gesture sensor 105.

[0062] The cabinet 100 and/or the built-in apparatus described in the present document enables a user to interact with an electronic device 150 in a comfortable and reliable manner, notably when cooking. Furthermore, the cabinet 100 allows the electronic device 150 to be stored in a protected position with regards to dirt and/or fluid.

[0063] It should be noted that the description and drawings merely illustrate the principles of the proposed methods and systems. Those skilled in the art will be able to implement various arrangements that, although not explicitly described or shown herein, embody the principles of the invention and are included within its spirit and scope. Furthermore, all examples and embodiment outlined in the present document are principally intended expressly to be only for explanatory purposes to help the reader in understanding the principles of the proposed methods and systems. Furthermore, all statements herein in providing principles, aspects, and embodiments of the invention, as well as specific examples thereof, are intended to encompass equivalents thereof.

Claims

1. Apparatus, which is adapted to be fastened and/or attached to a side wall (209) of a cabinet (100), preferably using screws, comprising:

- a frame (201), which encloses a slot (101) for receiving a handheld electronic device (150) having a display (151), and
- a hologram plate (120) which is configured to generate a hologram (160) within a projection area (108), based on an image (301) which is rendered by the display (151) of the electronic device (150);

characterized by

- a control unit (106) configured to detect that an electronic device (150) has been placed into the slot (101) and in reaction to this establish a communication link with the electronic device (150).

2. The apparatus of claim 1, wherein

- the slot (101) is arranged within a display plane; and
- the hologram plate (120) is arranged or con-

figured to be arranged at a predetermined angle (303), notably at 45°, with respect to the display plane, notably to allow for generating the hologram (160) based on an image (301) which is rendered by the display (151) of the electronic device (150), when the electronic device (150) is located within the slot (101).

3. The apparatus of claim 1 or 2, wherein the hologram plate (120) is configured to be moved between a stored position, in which the hologram plate (120) is parallel to the display plane, and a hologram position, in which the hologram plate (120) is arranged at the predetermined angle (303) with respect to the display plane, wherein the hologram plate (120) is attached to the frame (201) preferably via one or more pivots (202) allowing the hologram plate (120) to be rotated around a rotational axis, which is arranged in parallel to the device plane.

4. The apparatus of any previous claims, comprising a gesture sensor (105) configured to sense gesture data regarding a gesture performed by a user within the projection area (108); wherein the control unit (106) is preferably configured to cause the electronic device (150), when it is placed within the slot (101), to be controlled based on the gesture data.

5. The apparatus of any previous claims, comprising one or more microphones (104) configured to capture acoustic data regarding a voice control command of a user; wherein the control unit (106) is preferably configured to cause the electronic device (150), when it is placed within the slot (101), to be controlled based on the acoustic data.

6. The apparatus of any previous claims, comprising one or more speakers (103); wherein the control unit (106) is preferably configured to receive an audio signal from an electronic device (105) placed within the slot (101); and cause the audio signal to be rendered by the one or more speakers (103).

7. The apparatus of any previous claims, comprising a charging element (121), notably a charging coil, configured to charge the electronic device (150), when it is placed within the slot (101).

8. A cabinet (100) configured to be attached to and/or to be placed against a wall of a room; wherein the cabinet (100) comprises the apparatus according to any of the previous claims.

9. The cabinet (100) of claim 8, wherein

- the cabinet (100) comprises a front panel (109) intended to face a user of the cabinet (100);
- the front panel (109) is turned away from a wall

that the cabinet (100) is attached to and/or placed against;
 - the front panel (109) delimits an interior of the cabinet (100); and
 - the slot (101) extends from the front panel (109) 5
 towards the interior of the cabinet (100).

10. The cabinet (100) of claim 9, wherein

- the hologram plate (120) is located within the interior of the cabinet (100) adjacent, notably above or below, the slot (101); and
 - the projection area (108) is notably aligned with the front panel (109) of the cabinet (100). 10
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11. The cabinet (100) of claim 10, wherein

- the cabinet (100) comprises a movable cover (102) configured to cover the hologram plate (120) and configured to be moved away to give access to the hologram plate (120); 20
 - the movable cover (102) is aligned with the front panel (109) when the cover (102) covers the hologram plate (120);
 - the moveable cover (102) is notably configured to be slid behind or in front of the front panel (109) for giving access to the hologram plate (120); and 25
 - the projection area (108) is notably located where the cover (102) is located when the cover (102) covers the hologram plate (120). 30
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12. The cabinet (100) according to any of claims 8 to 11, wherein

- the cabinet (100) comprises a side wall (209), preferably a lower side wall at the bottom of the cabinet, which extends away from a wall that the cabinet (100) is attached to and/or placed against; 40
 - the side wall (209) is notably perpendicular to the wall that the cabinet (100) is attached to and/or placed against; and
 - the apparatus is attached to the side wall (209). 45

13. The cabinet (100) according to any of claims 8 to 12, wherein

- the display plane is perpendicular to a wall that the cabinet (100) is attached to and/or placed against; and/or 50
 - the display plane is parallel to a ground that the cabinet (100) is standing on and/or is aligned to; and/or
 - the display plane is parallel to a side wall (209) of the cabinet (100); and/or 55
 - the display plane is perpendicular to a front panel (109) of the cabinet (100).

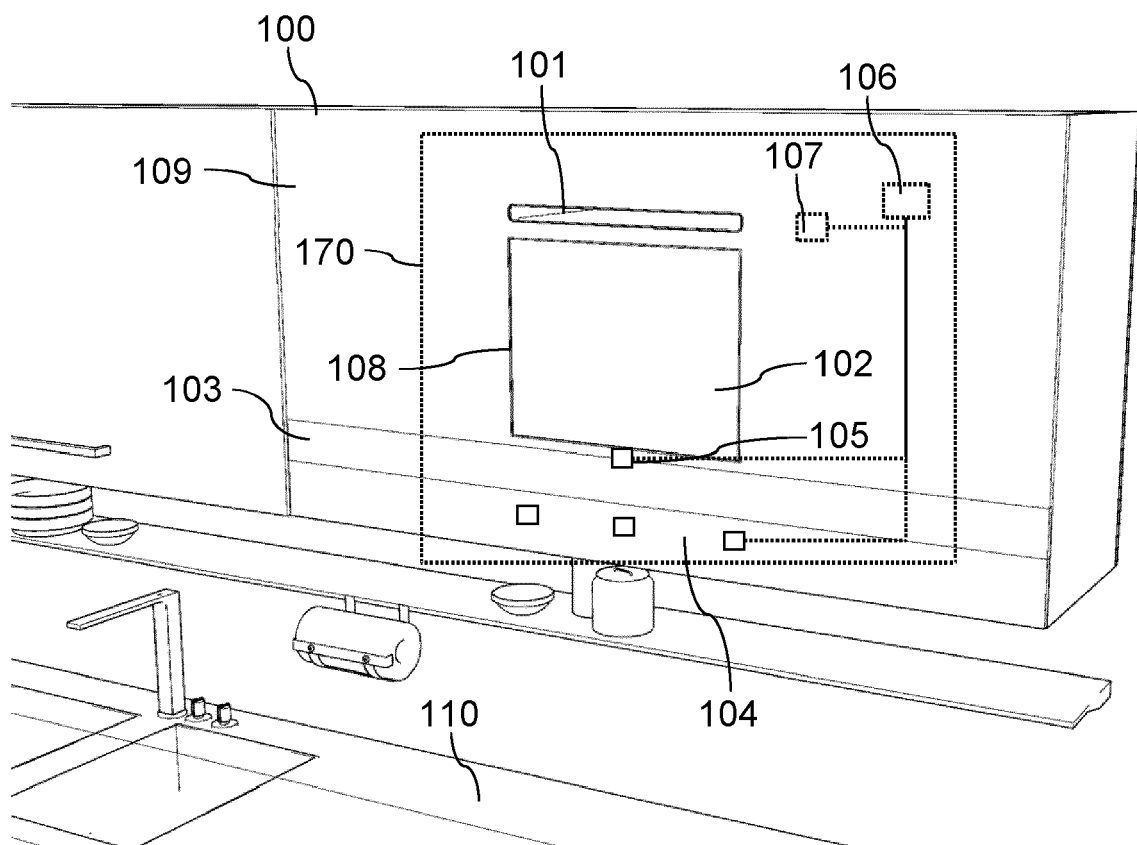


Fig. 1a

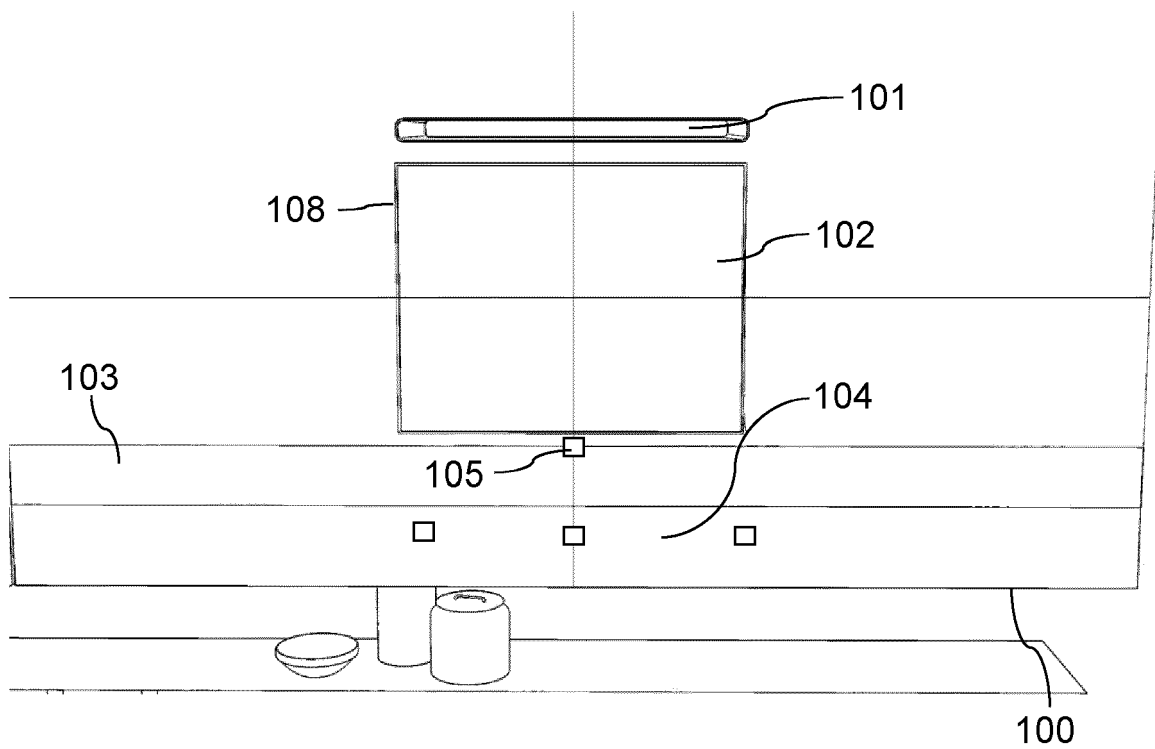


Fig. 1b

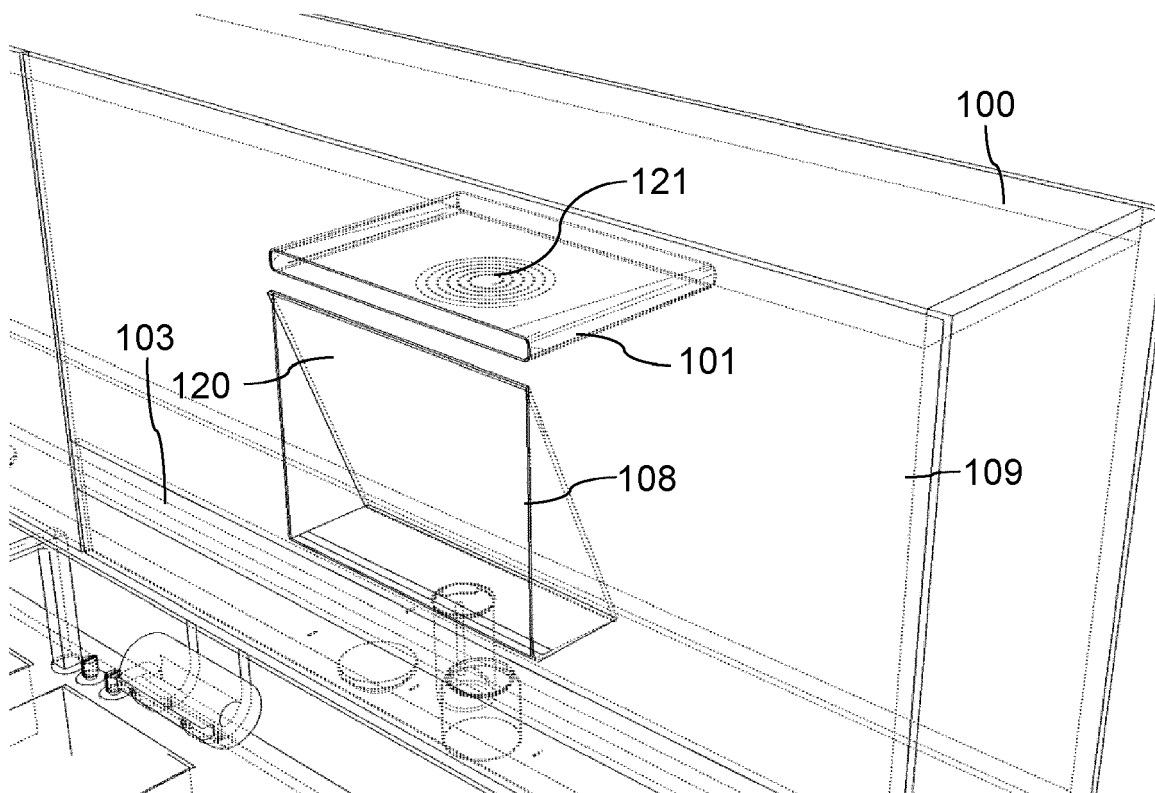


Fig. 1c

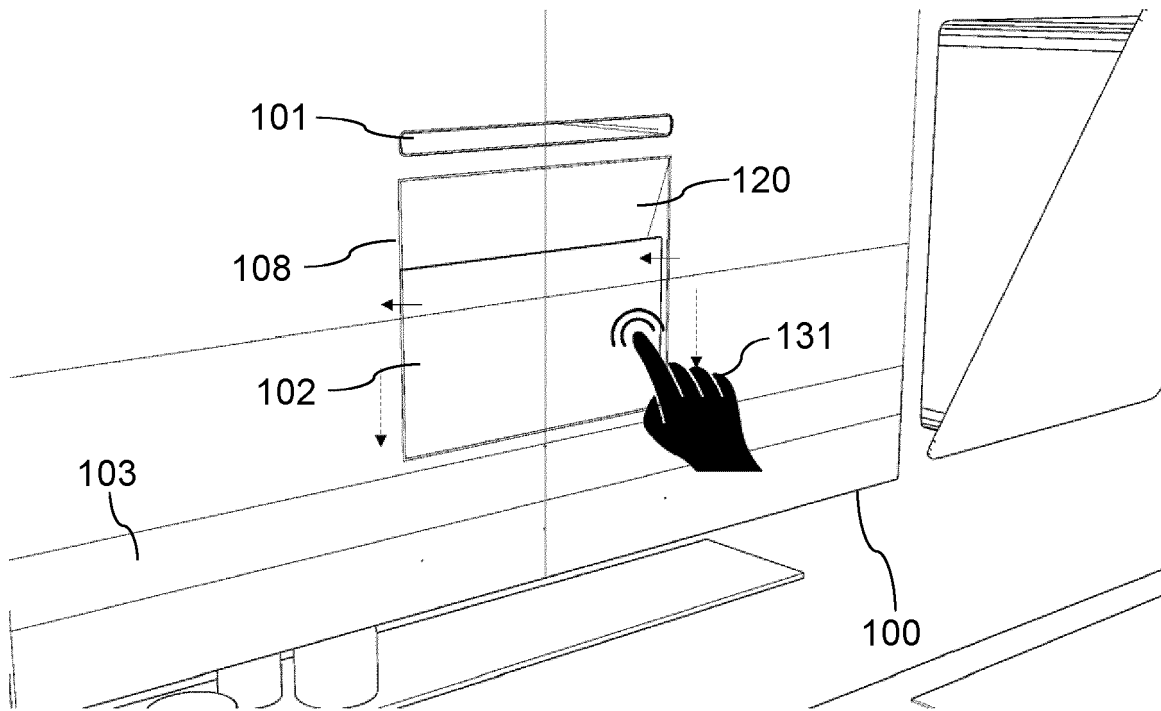


Fig. 1d

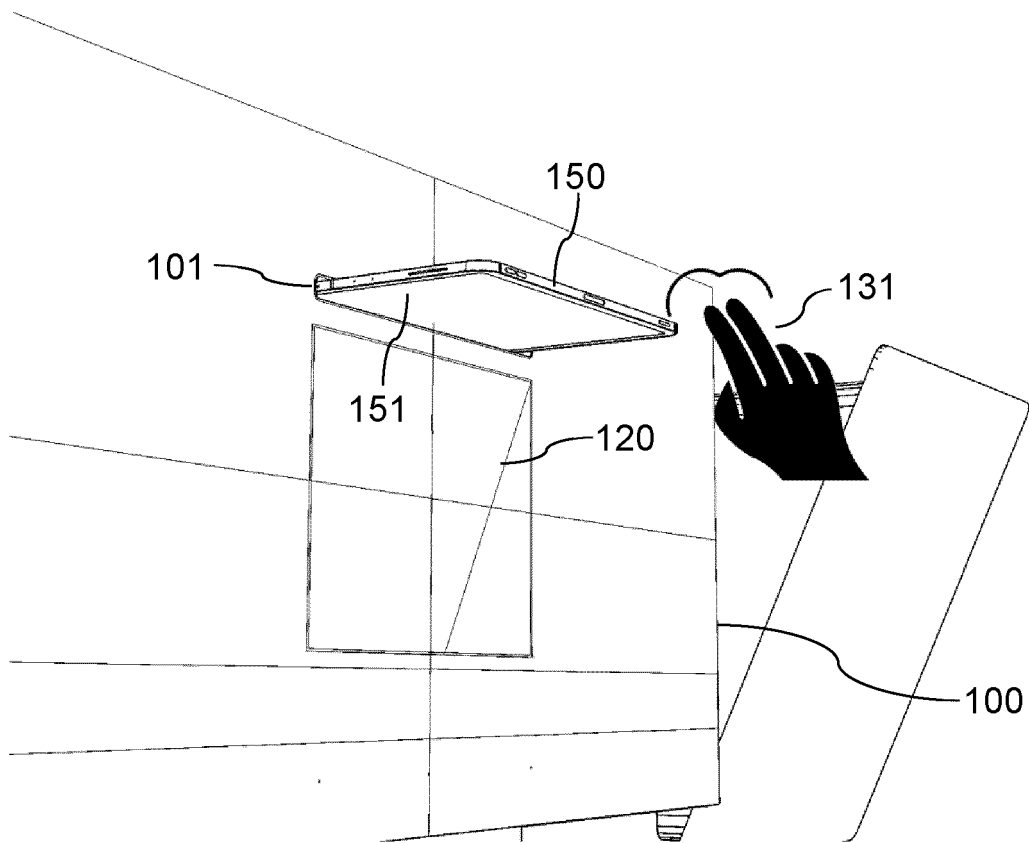


Fig. 1e

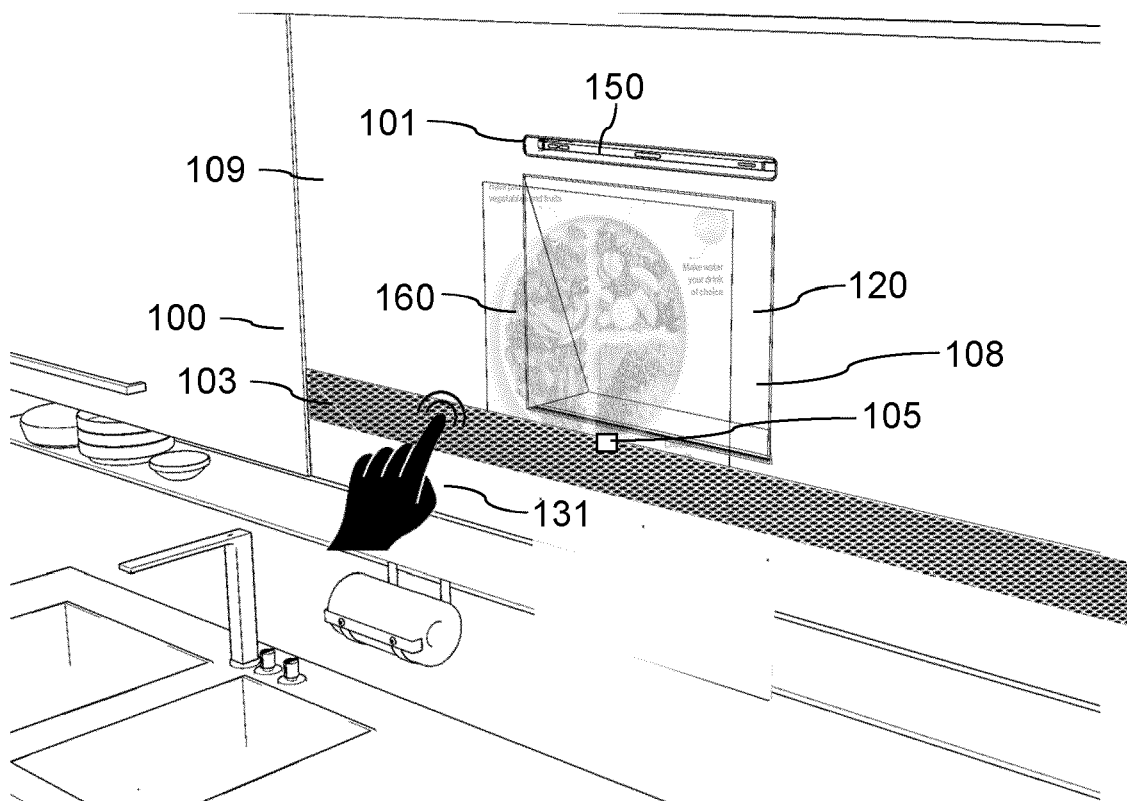


Fig. 1f

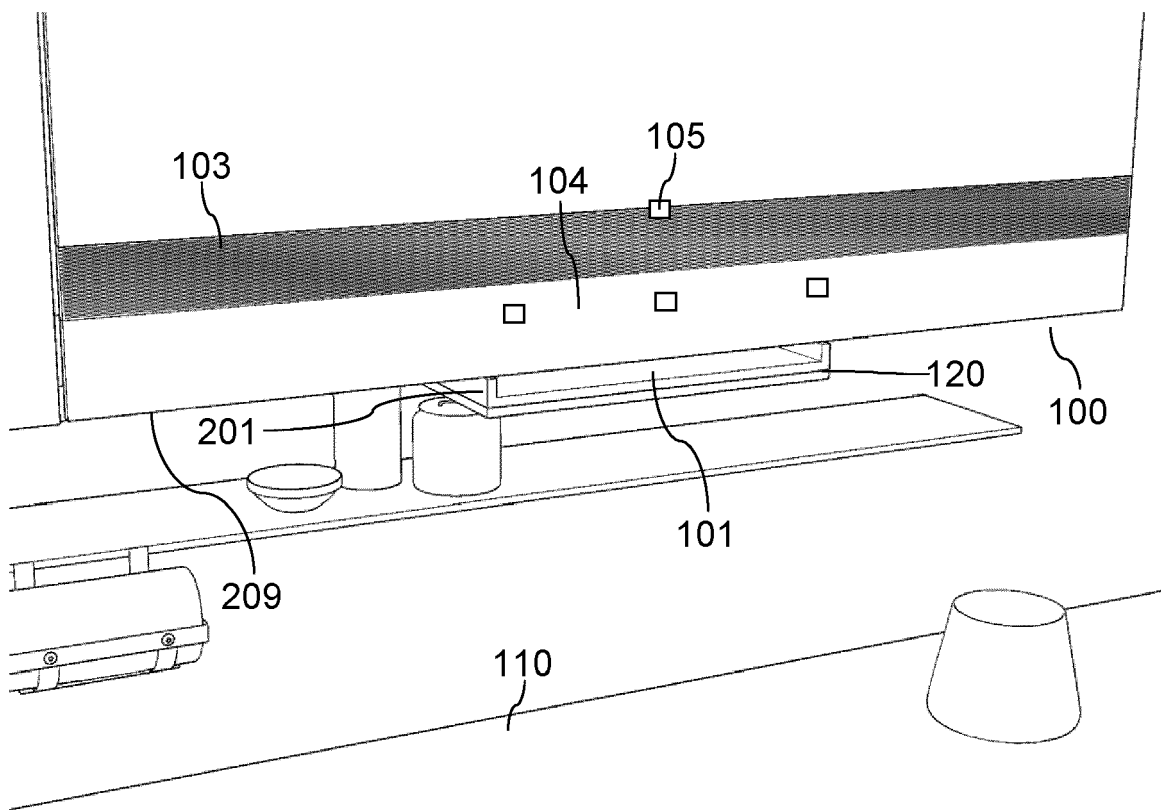


Fig. 2a

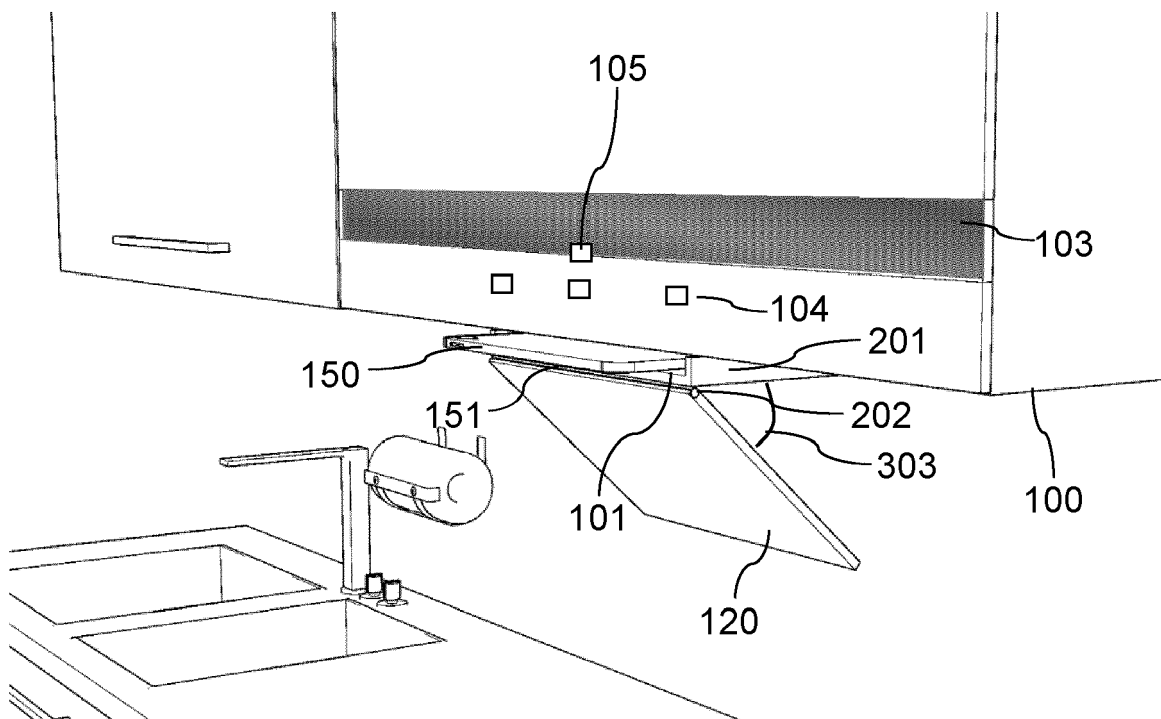


Fig. 2b

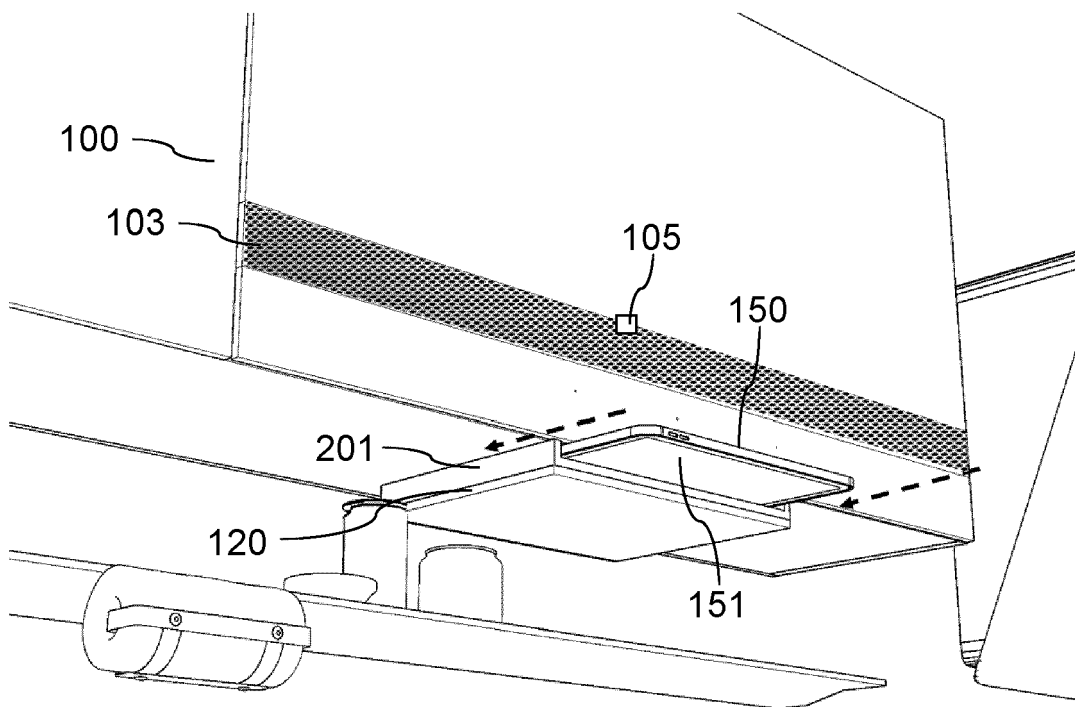


Fig. 2c

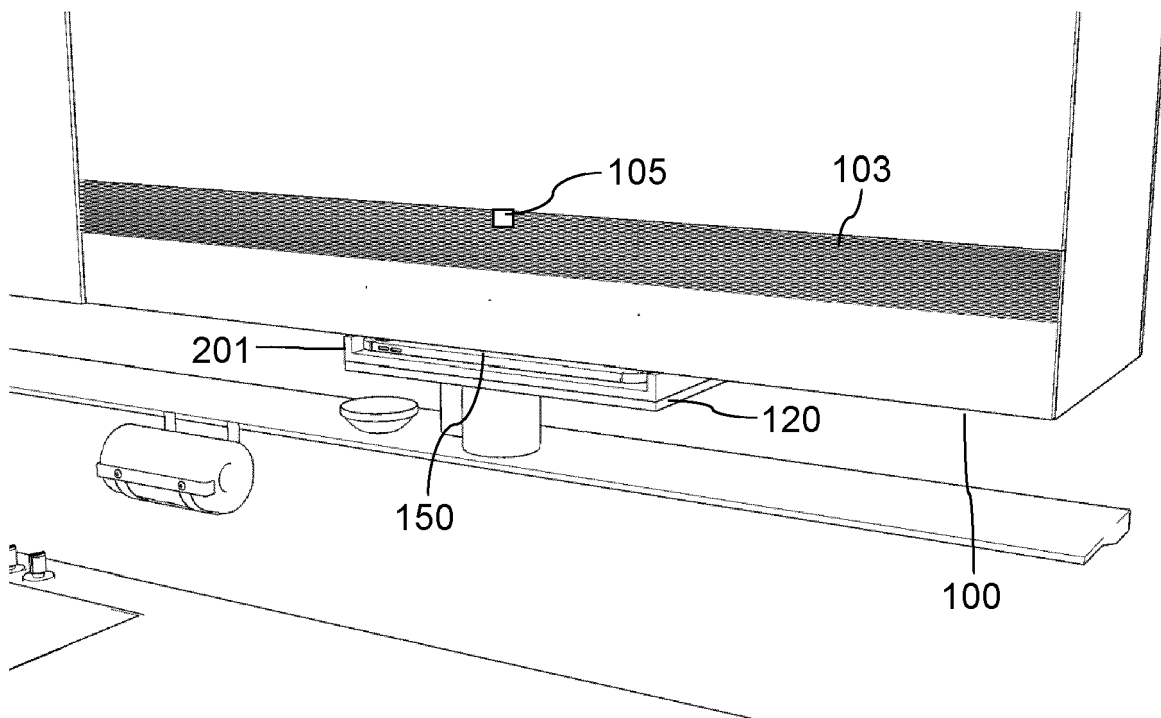


Fig. 2d

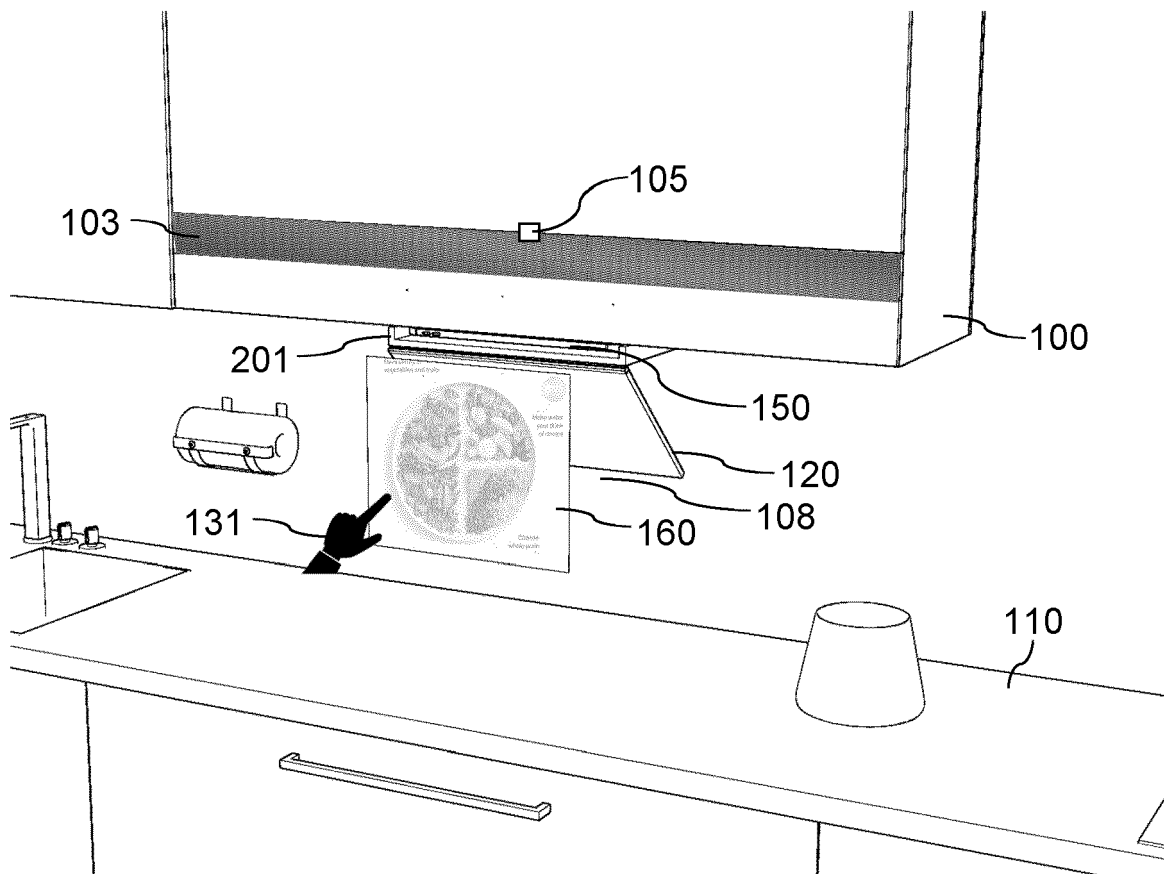


Fig. 2e

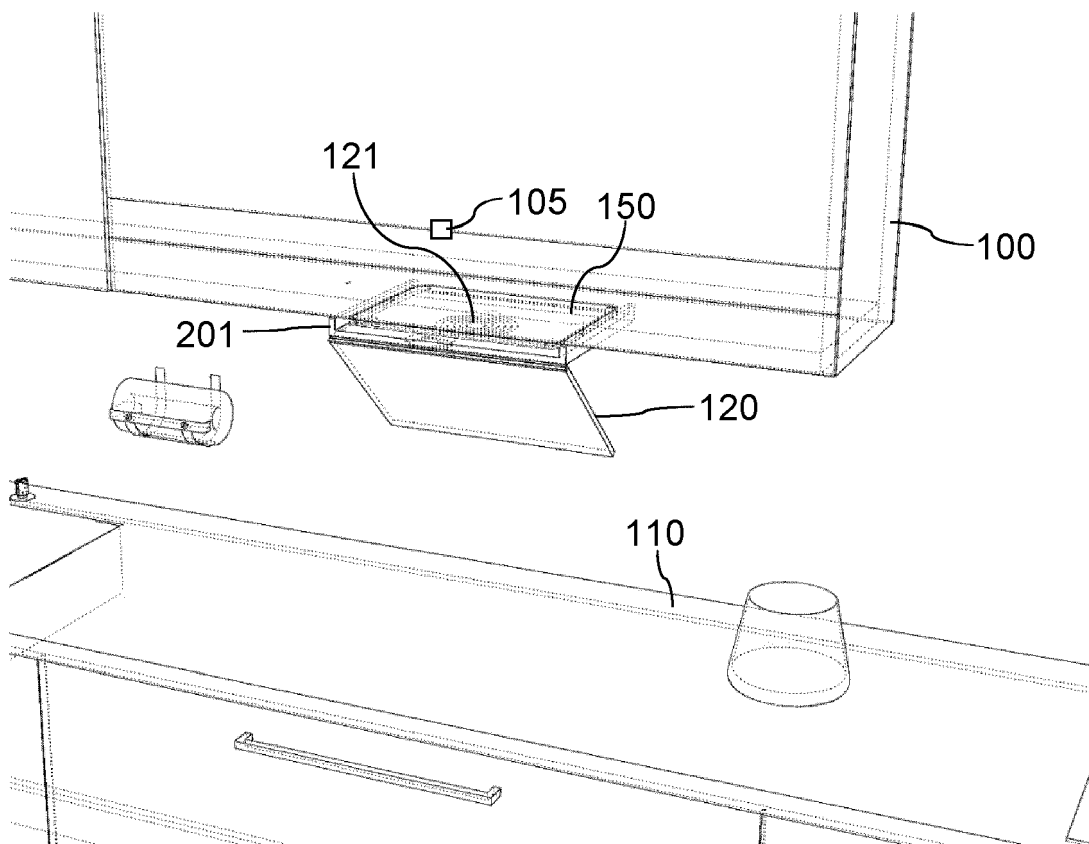


Fig. 2f

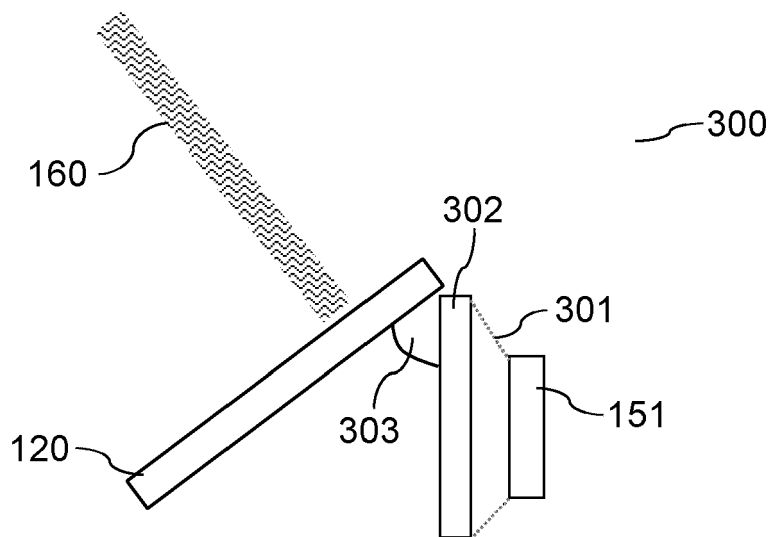


Fig. 3



EUROPEAN SEARCH REPORT

Application Number

EP 22 15 7767

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EPO FORM 1503 03:82 (P04C01)

Place of search The Hague	Date of completion of the search 17 August 2022	Examiner Linden, Stefan
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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17-08-2022

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