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Huang et al.

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(54) **CHIP CARD EJECTING MECHANISM**

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H04B 1/3816	(2015.01)
H04B 1/38	(2015.01)
H04M 1/02	(2006.01)
G06K 13/08	(2006.01)

(52) **U.S. Cl.**

CPC ***H04B 1/3816*** (2013.01); ***G06K 13/08*** (2013.01); ***H04B 1/38*** (2013.01); ***H04M 1/026*** (2013.01); *H04M 1/0274* (2013.01)

(58) **Field of Classification Search**

CPC H01R 13/447; H01R 13/5213; H01R 43/205; H05K 7/1053; H05K 7/1007

USPC 439/135, 159, 160, 38, 39, 331, 372, 439/260; 720/647; 235/479, 482, 483

See application file for complete search history.

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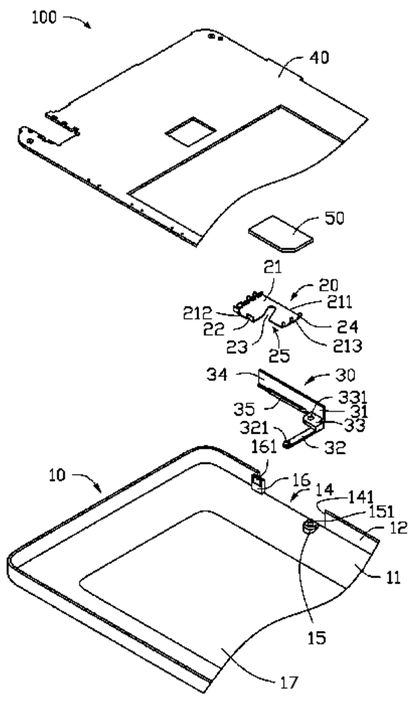
(57) **ABSTRACT**

A chip card ejecting mechanism includes a main body, a tray assembled in the main body and configured to receive a chip card, and a door. The door includes a rotating end rotatably mounted on the main body and a push pole protruding from the rotating end. A resisting portion is located on an end of the push pole away from the rotating end. When the door is opened and the rotating end is rotated relative to the main body, the resisting portion resists against the chip card and drives the chip card to move out from the main body.

20 Claims, 7 Drawing Sheets



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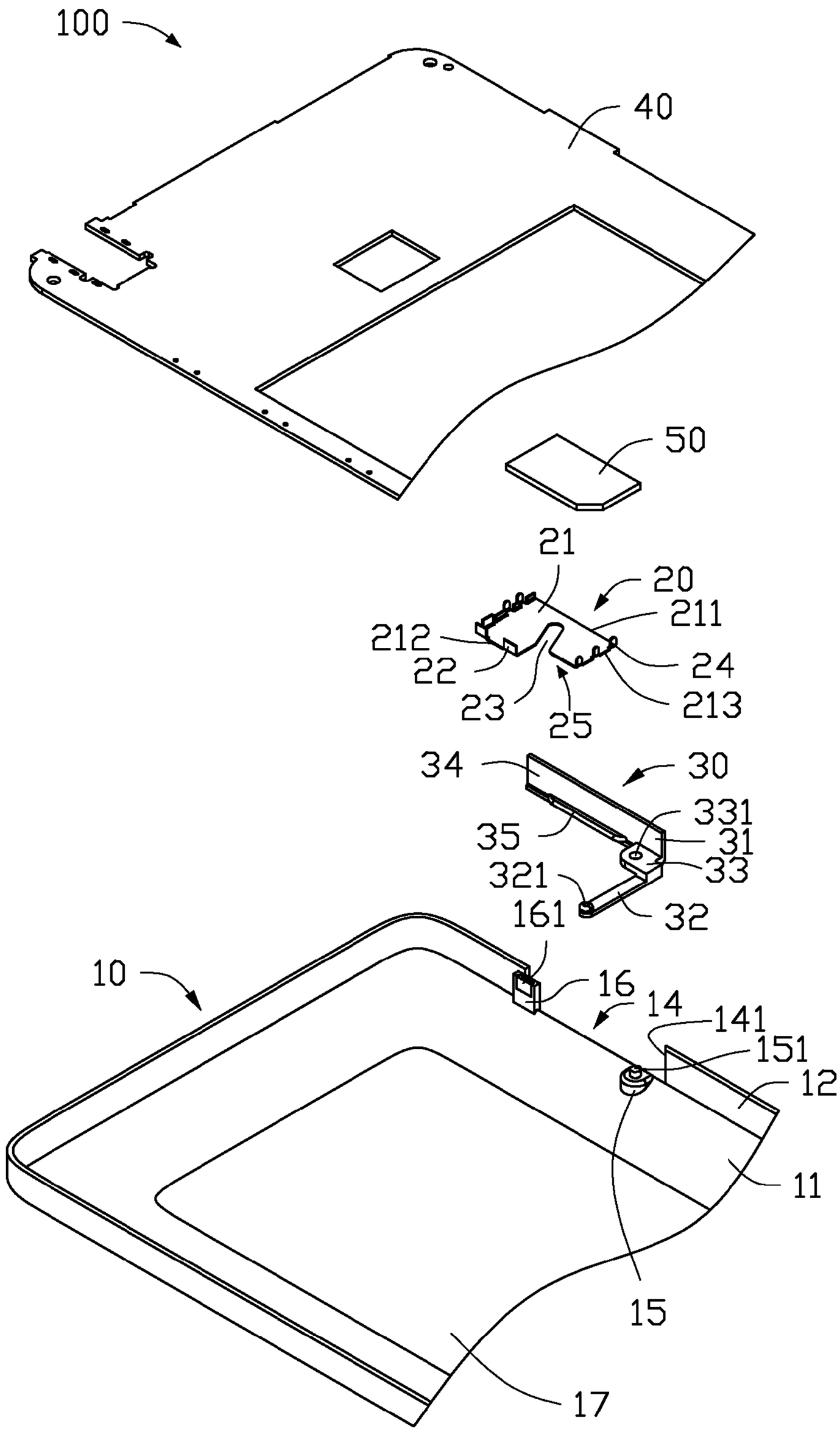
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FIG. 1

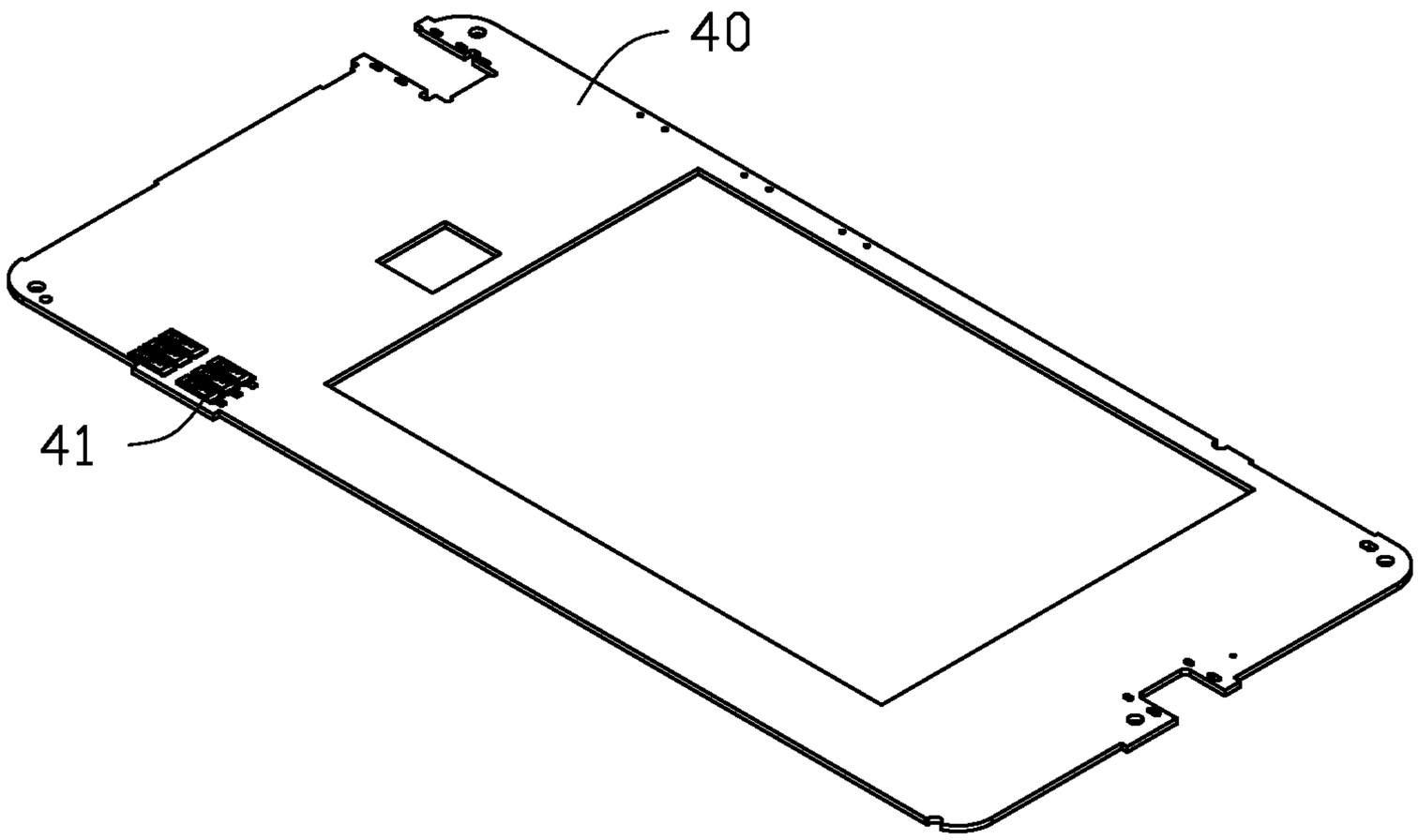

FIG. 2

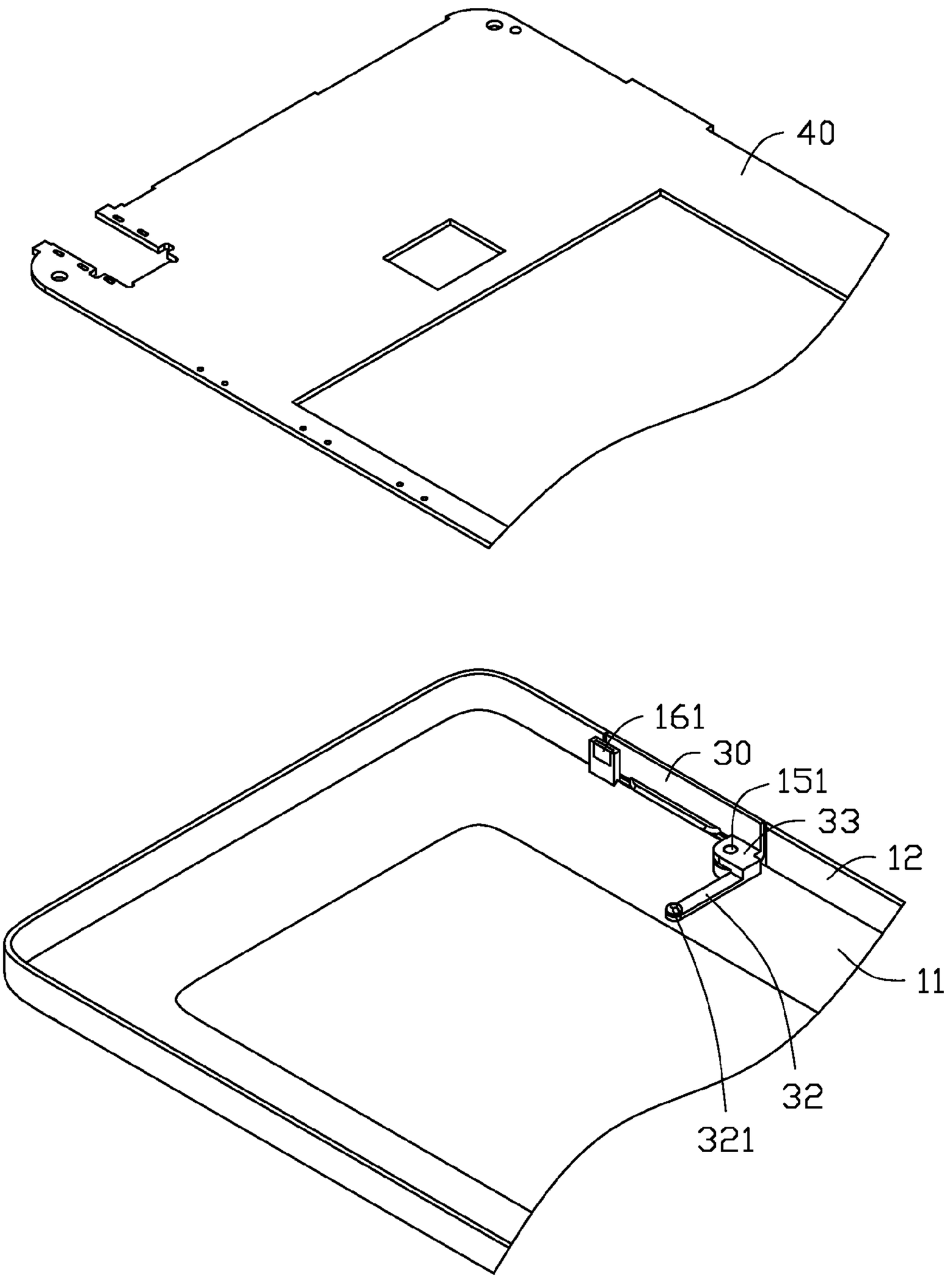

FIG. 3

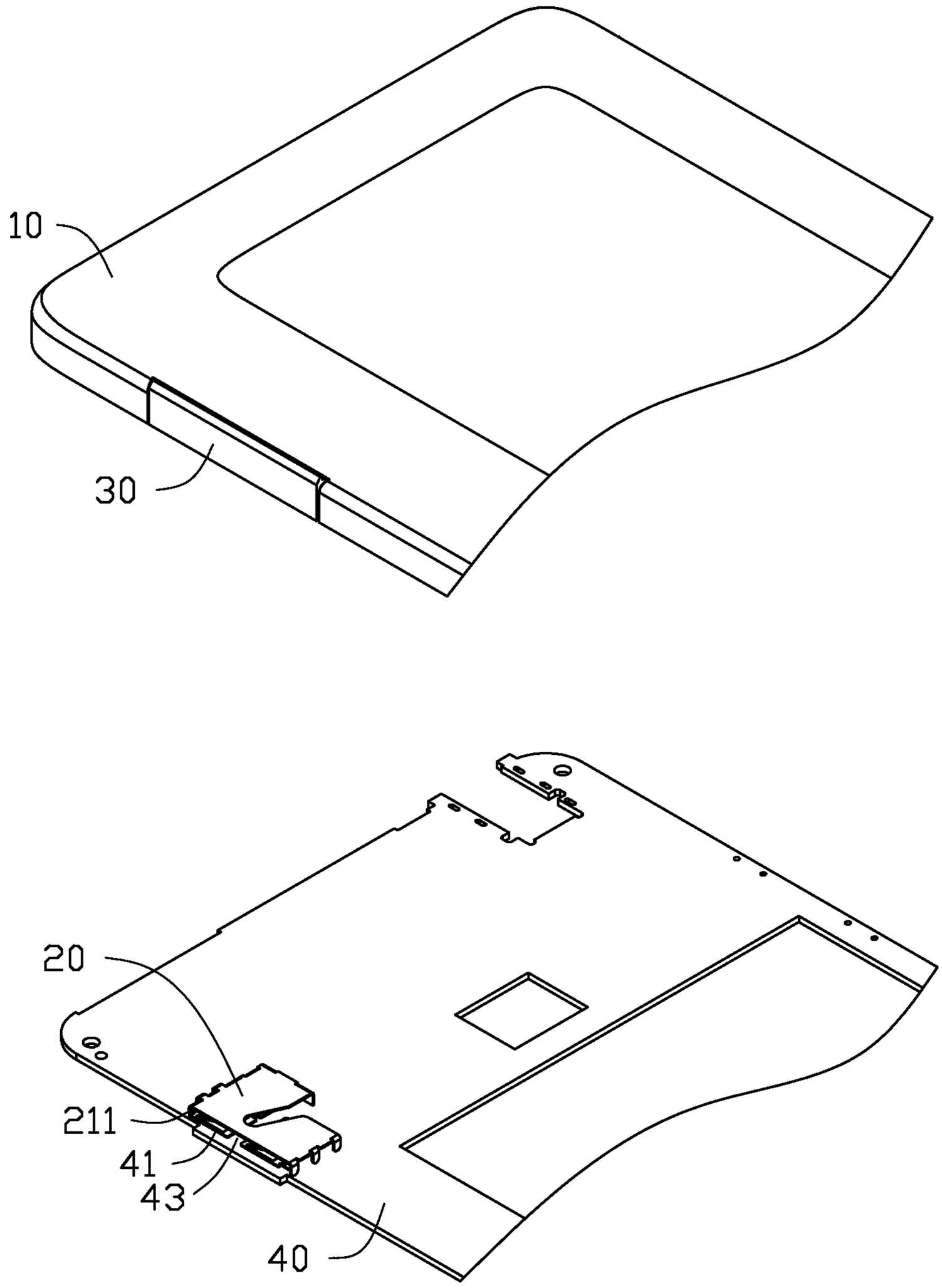

FIG. 4

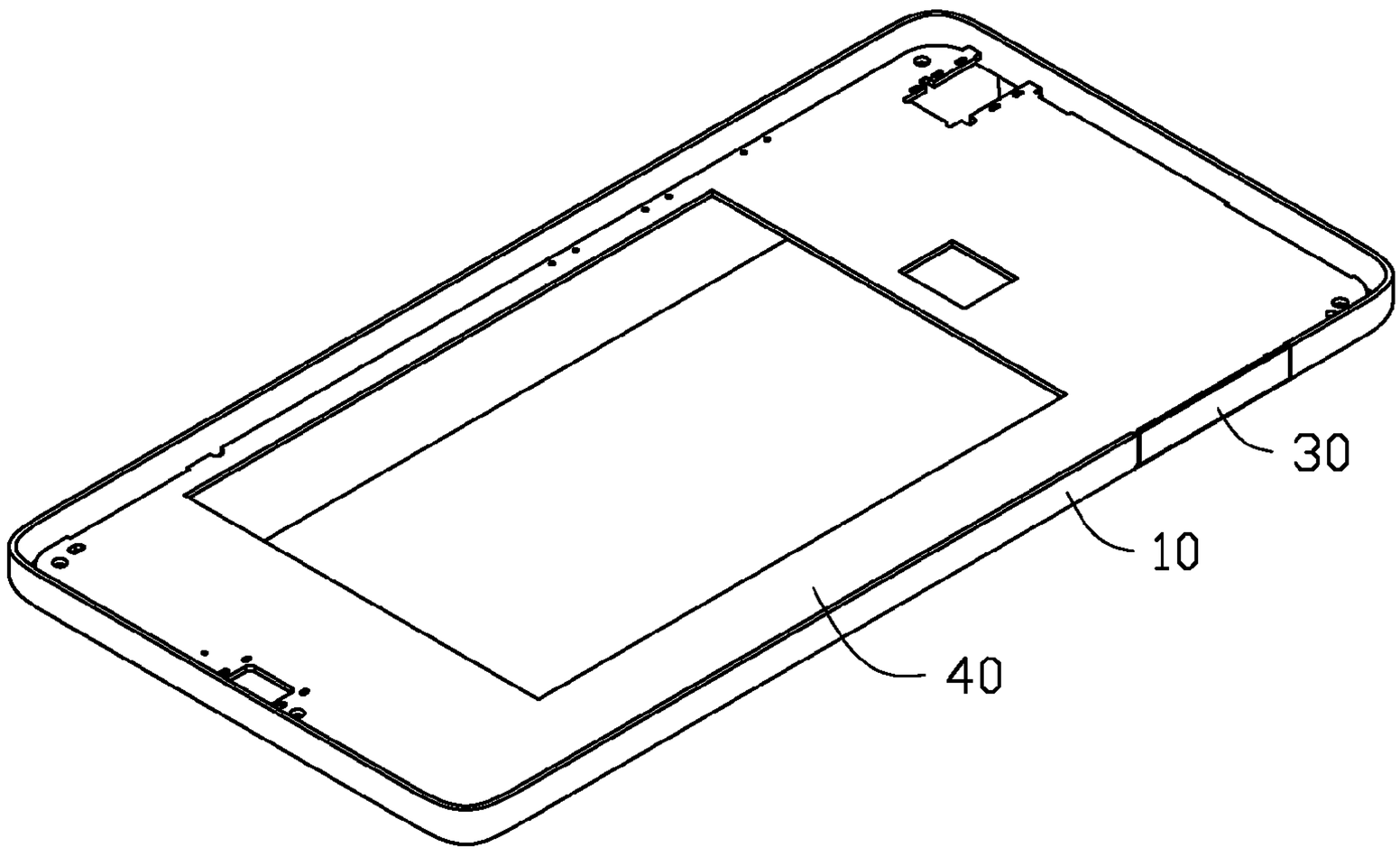

FIG. 5

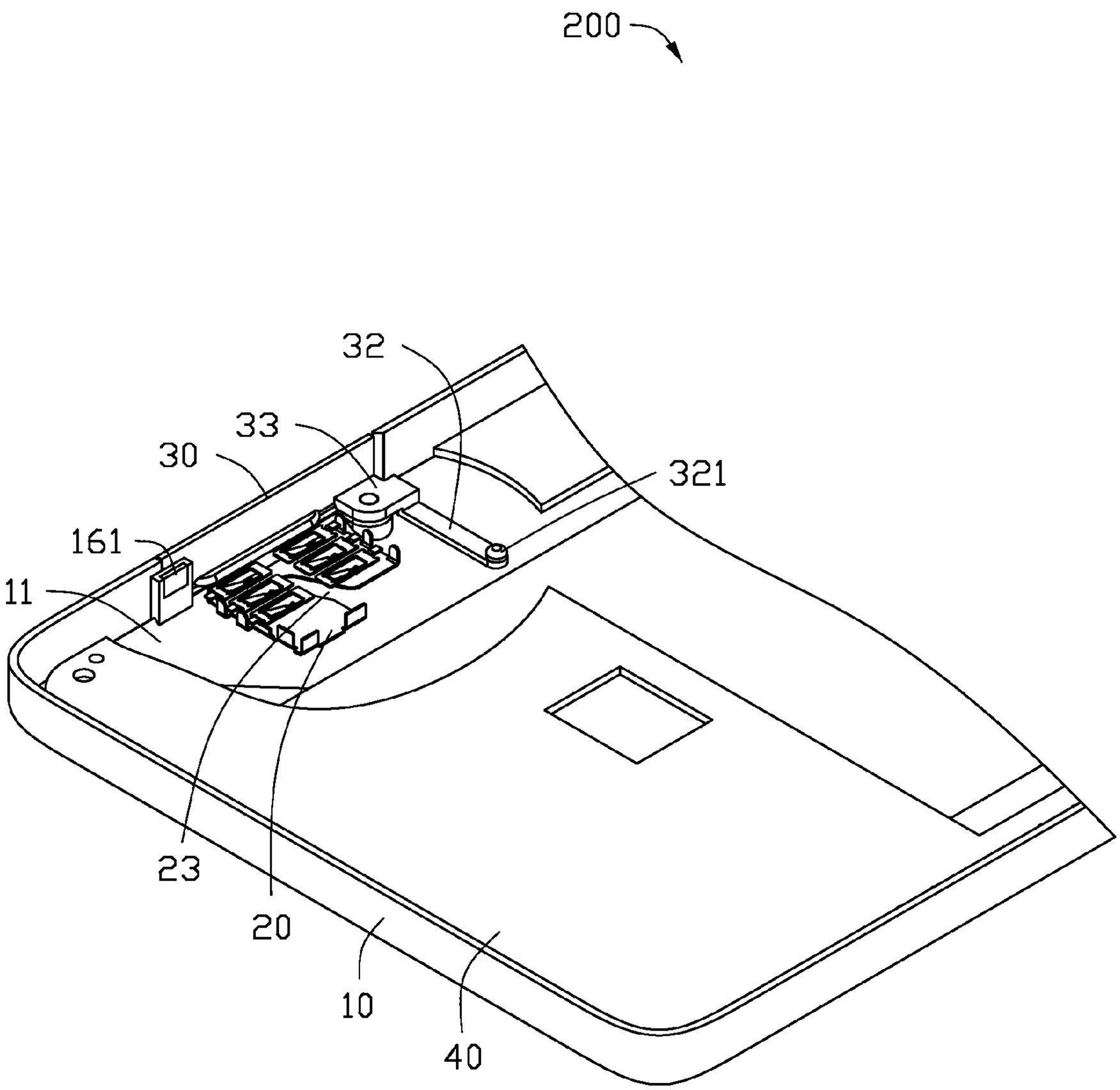

FIG. 6

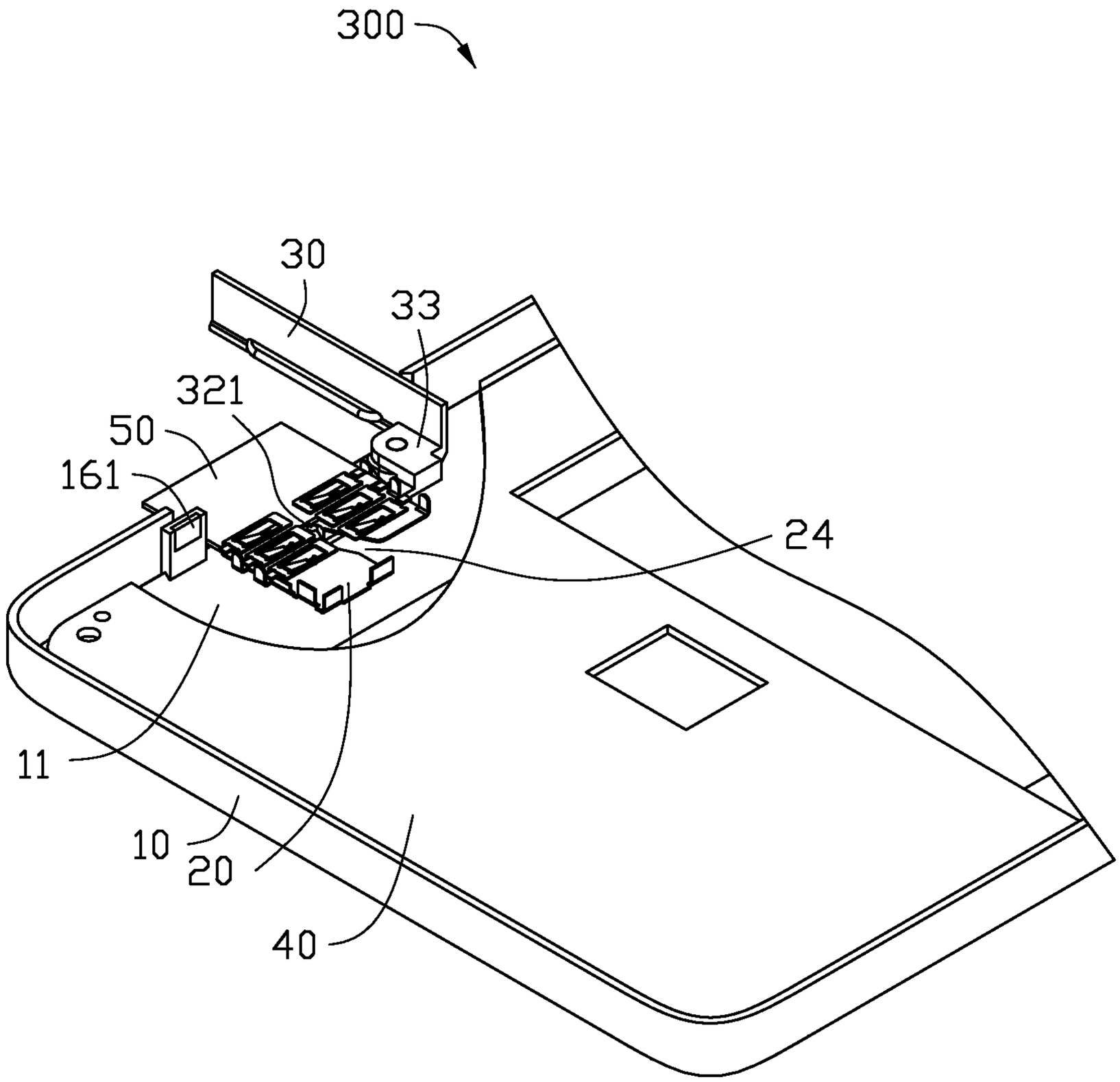

FIG. 7

CHIP CARD EJECTING MECHANISM

FIELD

The subject matter herein generally relates to a chip card ejecting mechanism.

BACKGROUND

Portable electronic devices, such as mobile phones, commonly include an operable ejecting mechanism for ejecting a chip card, such as a subscriber identity module (SIM) card, from a casing.

BRIEF DESCRIPTION OF THE DRAWINGS

Implementations of the present technology will now be described, by way of example only, with reference to the attached figures.

FIG. **1** is an exploded, isometric view of an embodiment of a chip card ejecting mechanism.

FIG. **2** is an isometric view of a circuit board of the chip card ejecting mechanism of FIG. **1**.

FIG. **3** is a partially assembled view of the chip card ejecting mechanism of FIG. **1**.

FIG. **4** is similar to FIG. **3**, but shown from another angle.

FIG. **5** is an assembled view of the chip card ejecting mechanism of FIG. **3**.

FIG. **6** is an isometric view of the chip card ejecting mechanism of FIG. **5**, showing a door in a closed configuration.

FIG. **7** is similar to FIG. **6**, but showing the door in an open configuration.

DETAILED DESCRIPTION

It will be appreciated that for simplicity and clarity of illustration, where appropriate, reference numerals have been repeated among the different figures to indicate corresponding or analogous elements. In addition, numerous specific details are set forth in order to provide a thorough understanding of the embodiments described herein. However, it will be understood by those of ordinary skill in the art that the embodiments described herein can be practiced without these specific details. In other instances, methods, procedures and components have not been described in detail so as not to obscure the related relevant feature being described. Also, the description is not to be considered as limiting the scope of the embodiments described herein. The drawings are not necessarily to scale and the proportions of certain parts have been exaggerated to better illustrate details and features of the present disclosure.

Several definitions that apply throughout this disclosure will now be presented.

The term "substantially" is defined to be essentially conforming to the particular dimension, shape or other word that substantially modifies, such that the component need not be exact. For example, substantially cylindrical means that the object resembles a cylinder, but can have one or more deviations from a true cylinder. The term "comprising" when utilized, means "including, but not necessarily limited to"; it specifically indicates open-ended inclusion or membership in the so-described combination, group, series and the like.

FIG. **1** illustrates a chip card ejecting mechanism **100** for removably receiving a chip card **50** in an electronic device (not shown), such as a mobile phone. The chip card **50** can be a subscriber identity module (SIM) card, a memory card, or a multimedia card (MMC).

The chip card ejecting mechanism **100** includes a main body **10**, a tray **20** assembled in the main body **10** and configured to receive the chip card **50**, and a door **30**. The door **30** includes a rotating end **31** rotatably mounted on the main body **10** and a push pole **32** protruding from the rotating end **31**. A resisting portion **321** is located on an end of the push pole **32** away from the rotating end **31**.

The main body **10** can be a housing of the electronic device, for example. The main body **10** includes a bottom surface **11** and a peripheral wall **12**. The peripheral wall **12** extends substantially perpendicularly from a periphery of the bottom surface **11**. The peripheral wall **12** defines an entrance **14**. The entrance **14** includes two opposite sidewalls **141**. In this embodiment, the entrance **14** is substantially rectangular. The door **30** can cover the entrance **14** and the chip card **50** can be received in and removed from the tray **20** through the entrance **14**.

The main body **10** further includes a projection **15** and a fixing portion **16**. The projection **15** projects from the bottom surface **11** adjacent to one sidewall **141** of the entrance **14**. The projection **15** includes a post **151** protruding from a surface of the projection **15** away from the bottom surface **11**. The fixing portion **16** is perpendicularly mounted on the bottom surface **11** adjacent to another sidewall **141** of the entrance **14**. A latching portion **161** is positioned on the fixing portion **16** and is configured to lock the door **30** when the door **30** covers the entrance **14**. In this embodiment, the locking portion **161** is a magnetic element, such as a magnet.

FIGS. **2-5** illustrate a circuit board **40** of the chip card ejecting mechanism **100**. The bottom surface **11** and the peripheral wall **12** cooperatively define a mounting space **17** for receiving the circuit board **40**. The circuit board **40** includes a plurality of connectors **41** configured for electronically connecting the chip card **50**.

The tray **20** is secured above the connectors **41** so that the tray **20** and the circuit board **40** cooperatively define a receiving space **43** aligned with the entrance **14** to receive the chip card **50**. The tray **20** includes a base **21**. The base **21** includes a first end **211**, a second end **212** opposite and parallel to the first end **211**, and a limiting plate **22** extending perpendicularly from the second end **212**. In this embodiment, the first side **211** is aligned with the entrance **14** and the receiving space **43**. The first side **211** is further mounted between the projection **15** and the fixing portion **16**. A guiding groove **23** is defined in the second end **212** adjacent to the limiting plate **22**. When the rotating end **31** is rotated relative to the main body **10**, the resisting portion **321** slides in the guiding groove **23** and resists against the chip card **50**.

The base **21** further includes two third ends **213** connected substantially perpendicularly to the first end **211** and the second end **212**. A plurality of connecting portions **24** are perpendicularly positioned on the two third ends **213**. The tray **20** is secured above the circuit board **40** by the ends of the connecting portions **24** away from the base **21**, which are mounted on the circuit board **40**. The circuit board **40**, the base **21**, and the plurality of the connecting portions **24** define the receiving space **43**. In this embodiment, a corner-edge piece of the base **21** defines a cutout **25**. The cutout **25** communicates with the guiding groove **23** and is configured to expose one portion of the chip card **50** from the tray **20**.

The door **30** further includes a shaft portion **33**, a free end **34**, and a flange **35**. The shaft portion **33** protrudes from a side of the rotating end **31** toward the entrance **14**. The push pole **32** extends from an end of the shaft portion **33** away from the door **30**. The shaft portion **33** defines a shaft hole **331**. The door **30** rotates relative to the main body **10** by the post **151** rotatably engaging in the shaft hole **331**. The free end **34** is

opposite to the rotating end **31** and configured to rotate the door **30** relative to the main body **10**. In this embodiment, the door **30** is made of magnetically attractive material, such as a metal. Thus, when the door **30** covers the entrance **14**, the free end **34** can be magnetically attracted to the fixing portion **16**. The flange **35** protrudes between the rotating end **31** and the free end **34** and resists against the chip card **50** for securing the chip card **50** so the chip card **50** will not loosen in the receiving space **43**.

FIGS. **6** and **7** illustrate when an external force opens the door **30**, the rotating end **31** is rotated relative to the main body **10** along with the door **30**, the resisting portion **321** moves and resists against the chip card **50** and drives the chip card **50** at least partially out from the main body **10**.

FIG. **6** illustrates the door **30** in a closed configuration **200**. When the chip card **50** is received in the receiving space **43**, the chip card **50** can be electronically connected to the connectors **41** of the circuit board **40**. The latching portion **161** of the fixing portion **16** magnetically attracts the free end **34** and the door **30** covers the entrance **14**. A periphery of the chip card **50** is resisted by the limiting plate **22** and the flange **35**. A portion of the chip card **50** adjacent to the second end **212** is exposed from the cutout **25**.

FIG. **7** illustrates the door **30** in an open configuration **300** in which the rotating end **31** rotates relative to the main body **10**. The resisting portion **321** rotates around the post **151** of the projection **15** and slides in the gilding groove **23** to resist against the chip card **50**. The chip card **50** is ejected from the receiving space **43** and is exposed from the entrance **14** for easy removal.

The embodiments shown and described above are only examples. Many details are often found in the art. Therefore, many such details are neither shown nor described. Even though numerous characteristics and advantages of the present technology have been set forth in the foregoing description, together with details of the structure and function of the present disclosure, the disclosure is illustrative only, and changes may be made in the detail, especially in matters of shape, size and arrangement of the parts within the principles of the present disclosure up to, and including the full extent established by the broad general meaning of the terms used in the claims. It will therefore be appreciated that the embodiments described above may be modified within the scope of the claims.

What is claimed is:

1. A chip card ejecting mechanism for ejecting a chip card, the chip card ejecting mechanism comprising:

a main body comprising a bottom surface and a projection projecting from the bottom surface, the projection comprising a post protruding from a surface of the projection away from the bottom surface;

a tray assembled in the main body and configured to receive the chip card; and

a door comprising:

a rotating end, one side of the rotating end defining a shaft hole, the rotating end rotatably mounted on the main body by the post rotatably engaging in the shaft hole;

a push pole protruding from the rotating end; and

a resisting portion located on an end of the push pole away from the rotating end;

wherein when the door is opened and the rotating end rotates relative to the main body, the resisting portion resists against the chip card and drives the chip card to move out from the main body.

2. The chip card ejecting mechanism of claim **1**, wherein the main body further comprises a peripheral wall extending perpendicularly from a periphery of the bottom surface, the peripheral wall defines an entrance forming two opposite sidewalls, the projection is projected from the bottom surface adjacent to one sidewall of the entrance, the door covers the entrance, and the chip card is received in and removed out from the tray through the entrance.

3. The chip card ejecting mechanism of claim **2**, wherein the door further comprise a shaft portion protruding from a side of the rotating end towards the entrance, the push pole is extended from an end of the shaft portion away from the door, the shaft hole is defined on the shaft portion.

4. The chip card ejecting mechanism of claim **2**, wherein the door further comprises a free end opposite to the rotating end and configured to rotate the door relative to the main body.

5. The chip card ejecting mechanism of claim **4**, wherein the main body further comprises a fixing portion perpendicularly mounted on the bottom surface adjacent to another sidewall of the entrance, a latching portion is positioned on the fixing portion and is configured to lock the free end when the door covers the entrance.

6. The chip card ejecting mechanism of claim **5**, wherein the door is made of a magnetically attractive material and the latching portion is a magnetic element.

7. The chip card ejecting mechanism of claim **4**, further comprising a circuit board, wherein the bottom surface and the peripheral wall cooperatively define a mounting space for receiving the circuit board, the circuit board comprises a plurality of connectors configured for electronically connecting the chip card, and the tray is secured above the connectors, the tray and the circuit board cooperatively define a receiving space aligned with the entrance to receive the chip card, the door further comprises a flange protruding between the rotating end and the free end to resist against the chip card when the door covers the entrance.

8. The chip card ejecting mechanism of claim **3**, wherein the tray comprises a base; the base comprises a first end, a second end opposite to and parallel to the first end, and a limiting plate perpendicularly extending from the second end; the first end is aligned with the entrance and the receiving space, and is further mounted between the projection and the fixing portion; the base defines a guiding groove on the second end adjacent to the limiting plate and, when the rotating end is rotated relative to the main body, the resisting portion slides in the guiding groove and resists against the chip card.

9. The chip card ejecting mechanism of claim **8**, wherein the base further comprises two third ends substantially perpendicularly connected to the first end and the second end, a plurality of connecting portions perpendicularly positioned on the two third ends, the tray is secured above the circuit board by ends of the connecting portions away from the base being mounted on the circuit board, and the receiving space is formed by the circuit board, the base, and the plurality of the connecting portions.

10. The chip card ejecting mechanism of claim **8**, wherein a corner-edge piece of the base defines a cutout, the cutout communicates with the guiding groove and is configured to expose one portion of the chip card from the tray.

11. A chip card ejecting mechanism for removing a chip card, the chip card ejecting mechanism comprising:

a main body comprising a bottom surface and a projection projecting from the bottom surface, the projection comprising a post protruding from a surface of the projection away from the bottom surface;

a tray assembled in the main body and configured to receive the chip card; and

a door comprising:

a rotating end, one side of the rotating end defining a shaft hole, the rotating end rotatably mounted on the main body by the post rotatably engaging in the shaft hole;

a push pole protruding from the rotating end; and

a resisting portion located on an end of the push pole away from the rotating end;

wherein the door is transitionable between: (i) a closed configuration in which the main body is covered by the door and the chip card is received in the tray; and (ii) an open configuration in which the door rotates relative to the main body to drive the resisting portion to resist against the chip card for removing the chip card out from the main body.

12. The chip card ejecting mechanism of claim **11**, wherein the main body further comprises a peripheral wall extending perpendicularly from a periphery of the bottom surface, the peripheral wall defines an entrance forming two opposite sidewalls, the projection is projected from the bottom surface adjacent to one sidewall of the entrance, the door covers the entrance, and the chip card is received in and removed out from the tray through the entrance.

13. The chip card ejecting mechanism of claim **12**, wherein the door further comprise a shaft portion protruding from a side of the rotating end towards the entrance, the push pole is extended from an end of the shaft portion away from the door, the shaft hole is defined on the shaft portion.

14. The chip card ejecting mechanism of claim **12**, wherein the door further comprises a free end opposite to the rotating end and configured to rotate the door relative to the main body.

15. The chip card ejecting mechanism of claim **14**, wherein the main body further comprises a fixing portion perpendicularly mounted on the bottom surface adjacent to another sidewall of the entrance, a latching portion is positioned on the fixing portion and is configured to lock the free end when the door covers the entrance.

16. The chip card ejecting mechanism of claim **14**, further comprises a circuit board, the bottom surface and the peripheral wall cooperatively define a mounting space for receiving the circuit board, the circuit board comprises a plurality of connectors configured for electronically connecting the chip card, the tray is secured above the connectors, and the tray and the circuit board cooperatively define a receiving space aligned with the entrance to receive the chip card, the door further comprises a flange protruding between the rotating end and the free end to resist against the chip card when the door covers the entrance.

17. The chip card ejecting mechanism of claim **13**, wherein the tray comprises a base; the base comprises a first end, a second end opposite to and parallel to the first end, and a limiting plate perpendicularly extending from the second end; the first end is aligned with the entrance and the receiving space, and is further mounted between the projection and the fixing portion; and the base defines a guiding groove on the second end adjacent to the limiting plate and, when the rotating end is rotated relative to the main body, the resisting portion slides in the guiding groove and resists against the chip card.

18. The chip card ejecting mechanism of claim **17**, wherein the base further comprises two third ends substantially perpendicularly connected to the first end and the second end, a plurality of connecting portions perpendicularly positioned on the two third ends, the tray is secured above the circuit board by ends of the connecting portions away from the base being mounted on the circuit board, and the receiving space is formed by the circuit board, the base, and the plurality of the connecting portions.

19. The chip card ejecting mechanism of claim **17**, wherein a corner-edge piece of the base is cut off to define a cutout, the cutout communicates with the guiding groove and is configured to expose one portion of the chip card from the tray.

20. A chip card ejecting mechanism configured to eject a chip card, the chip card ejecting mechanism comprising:

a main body comprising a bottom surface and a projection projecting from the bottom surface, the projection comprising a post protruding from a surface of the projection away from the bottom surface;

a tray coupled to the main body and configured to receive the chip card;

a door comprising:

a rotating end, one side of the rotating end defining a shaft hole, the rotating end rotatably mounted on the main body by the post rotatably engaging in the shaft hole;

a push pole protruding from the rotating end;

a resisting portion located on an end of the push pole away from a portion protruding from the rotating end;

wherein the rotating end rotates relative to the main body while the door is being opened and the resisting portion provides a motive force to eject the chip card out from the main body.

* * * * *