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(54) **STRUCTURE FOR A PORTABLE  
ELECTRONIC DEVICE HANDLE**

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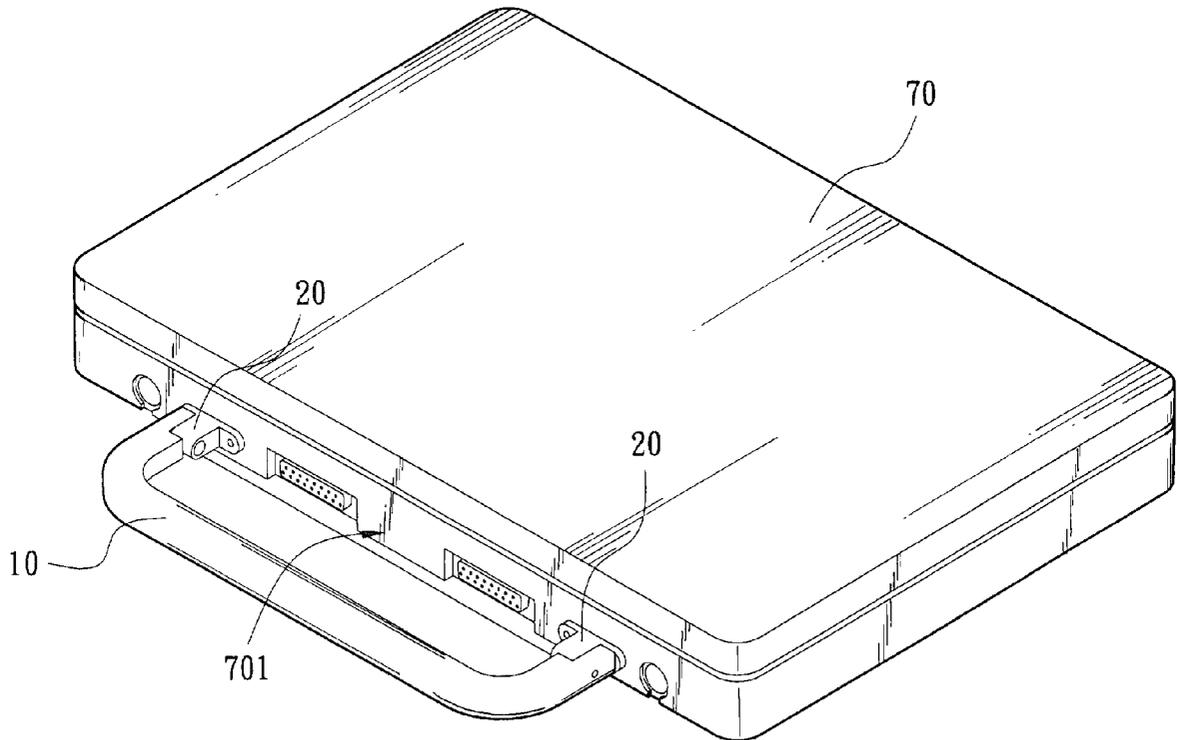
(57) **ABSTRACT**

A handle structure of a portable electronic device, designed for users to hold or carry the portable electronic device and freely adjust the fixation angle of the handle. The invention comprises a base, a connector, a handle and a fastener. The base is installed beside the electronic device. The connector has a plurality of grooves on its surface pivotally connecting the handle and the base. Inside the base is a fastener that is in a locked position while in a normal state so that it sticks into a groove and locks the handle. The fastener may also be in a released position so that it releases from the groove to allow the handle to rotate and change angles.

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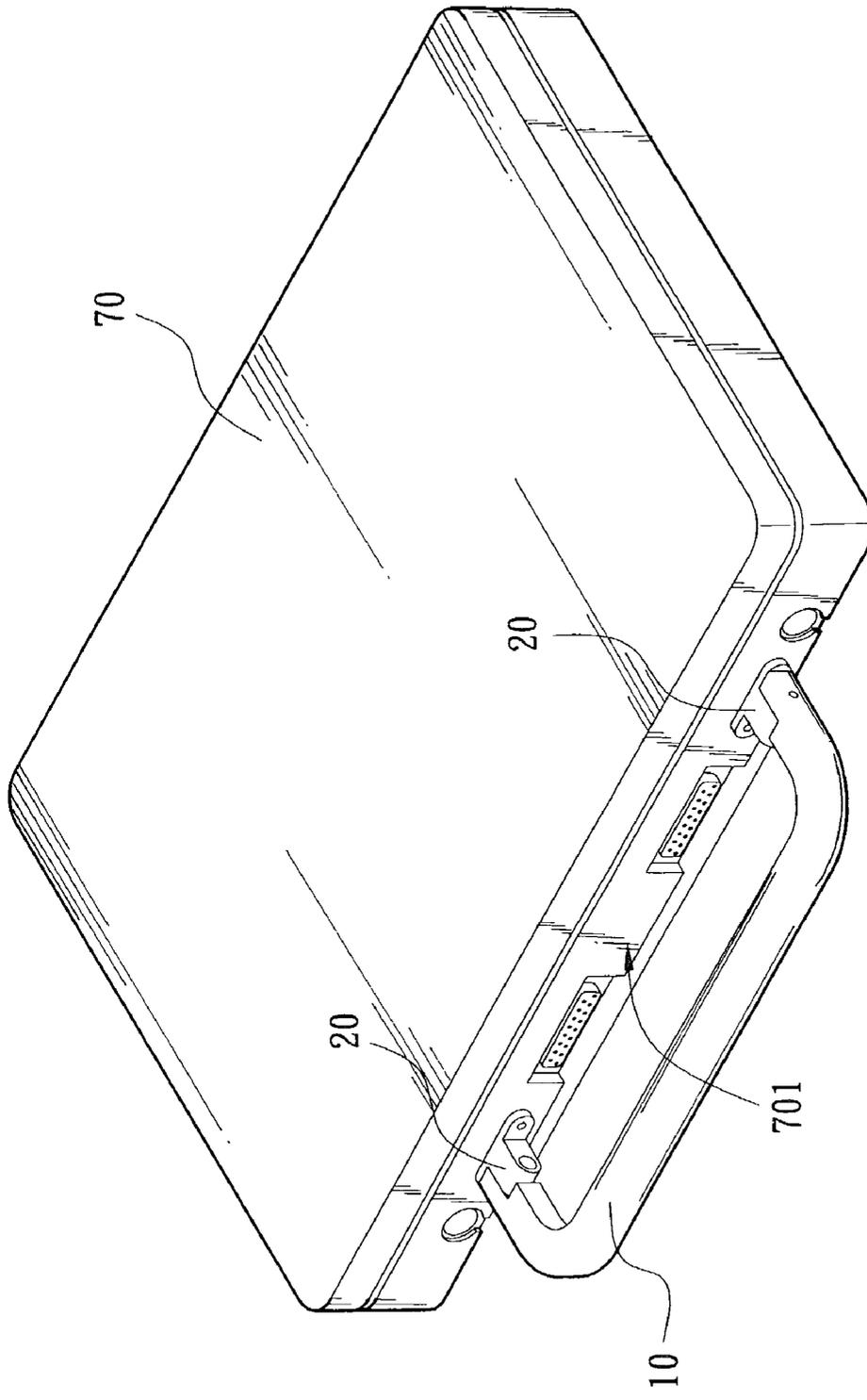


FIG. 1

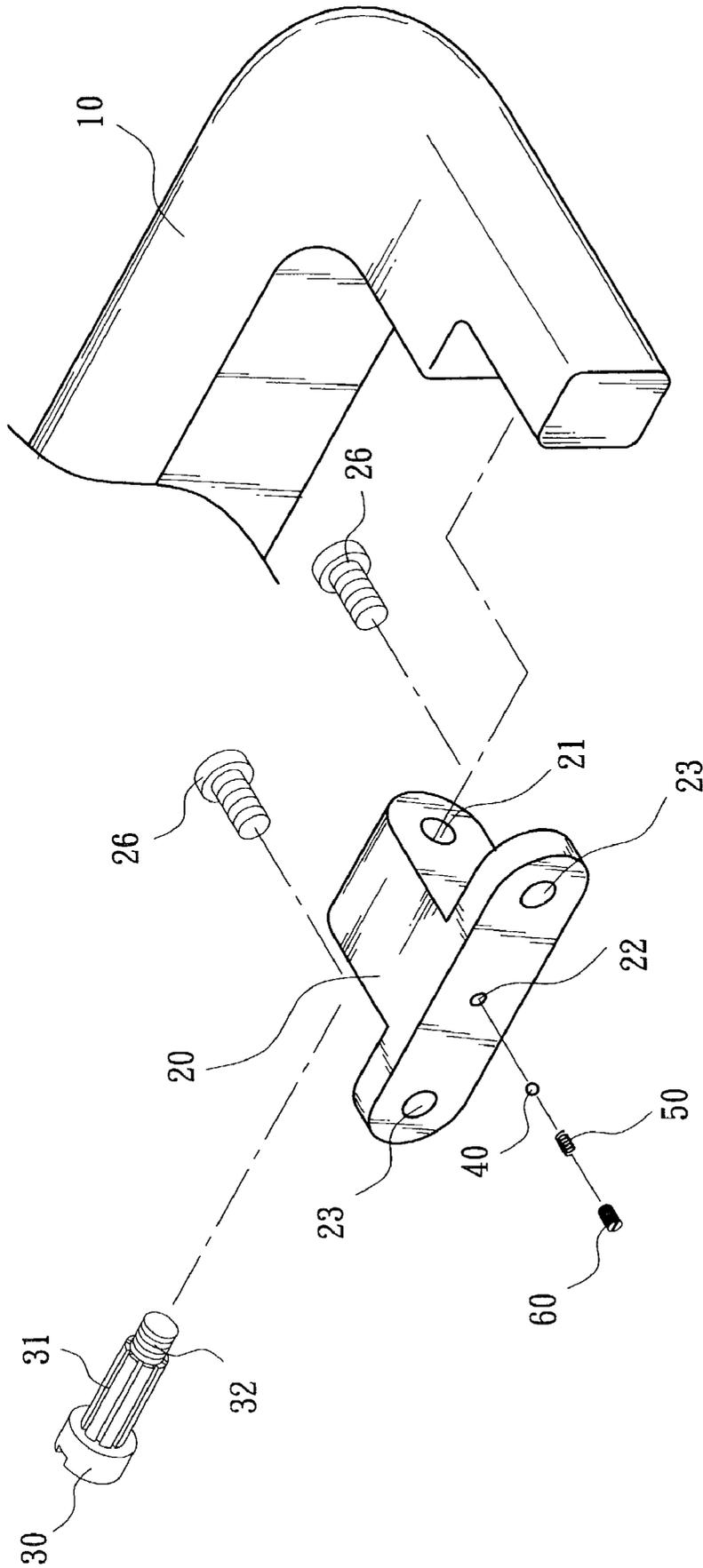


FIG. 2

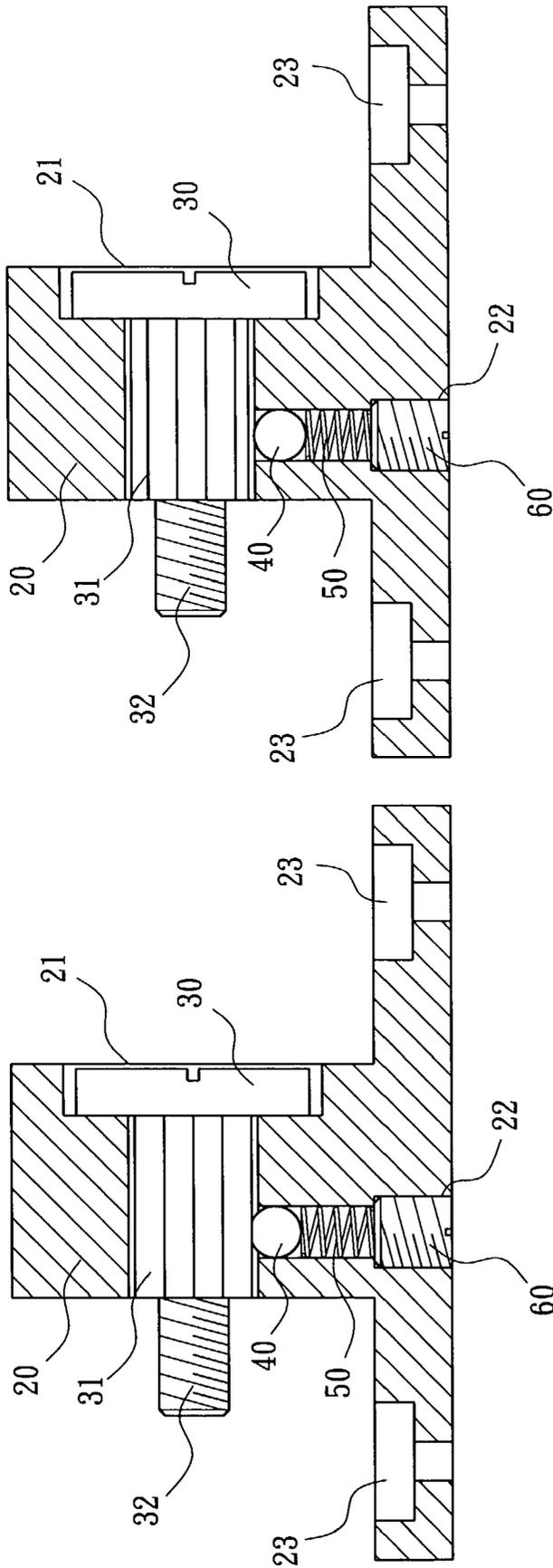


FIG. 3B

FIG. 3A

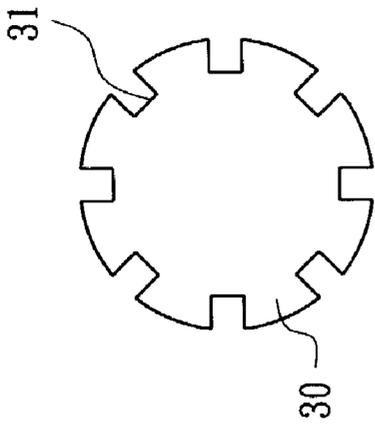


FIG. 4B

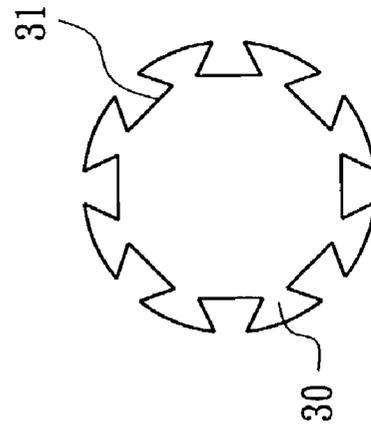


FIG. 4D

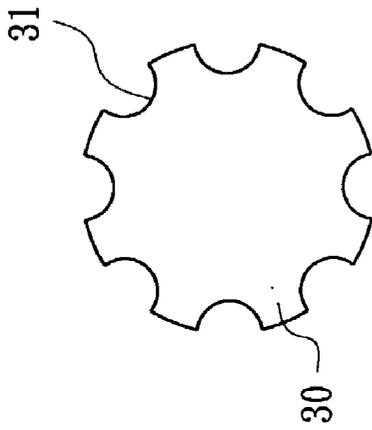


FIG. 4A

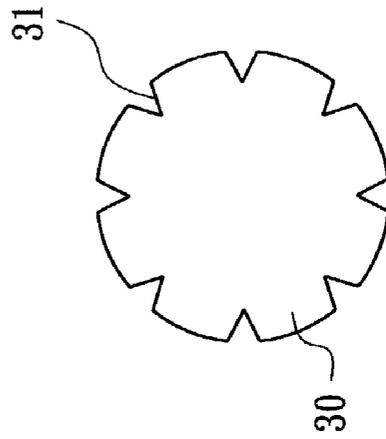


FIG. 4C

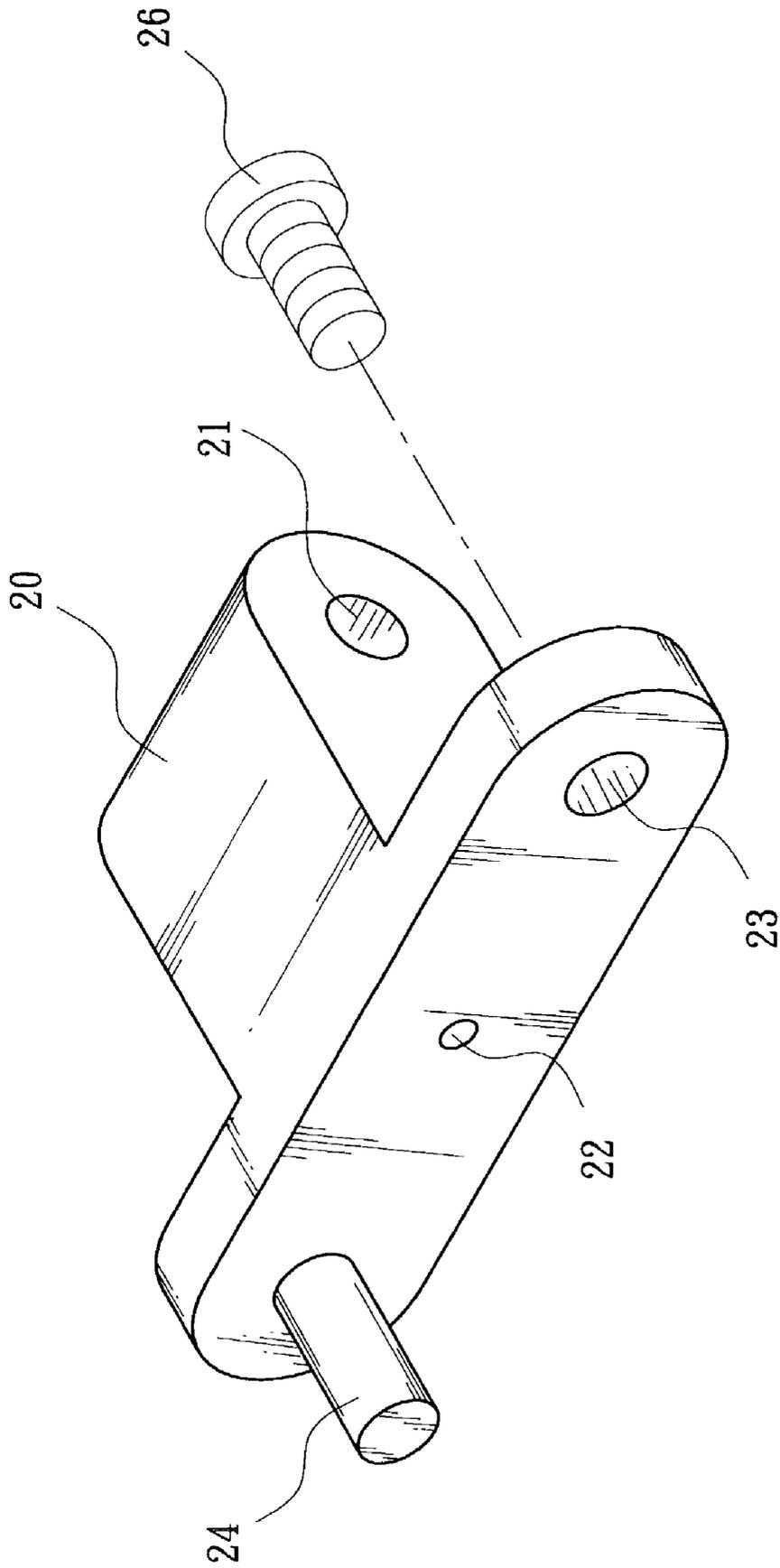


FIG. 5

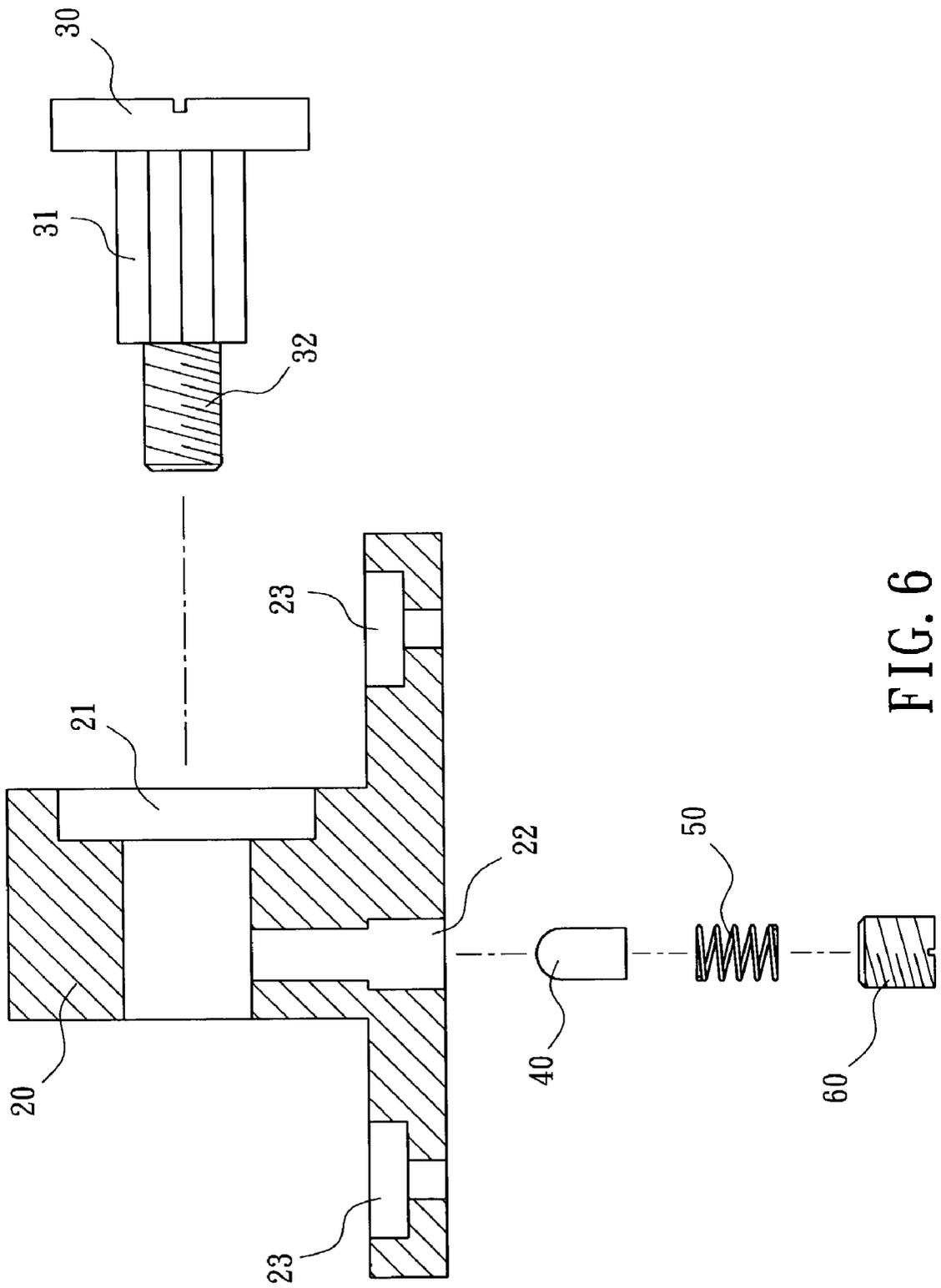


FIG. 6

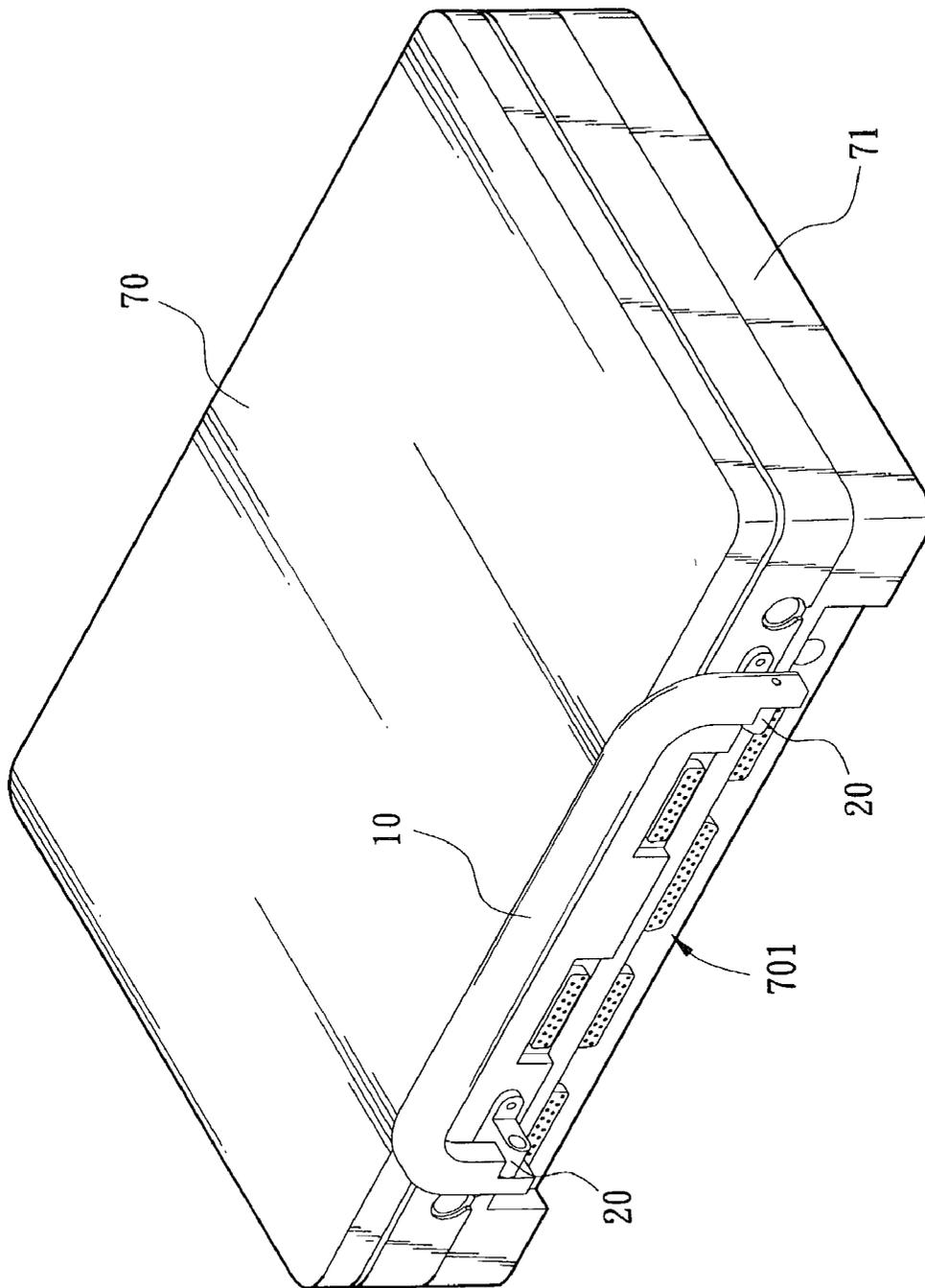


FIG. 7

## STRUCTURE FOR A PORTABLE ELECTRONIC DEVICE HANDLE

### FIELD OF THE INVENTION

[0001] The invention relates to the handle structure of a portable electronic device, and more particularly to the handle structure of a notebook computer for industrial or military purposes. The tilt angle of the handle can be adjusted and held in the new angle by its retaining structure.

### BACKGROUND OF THE INVENTION

[0002] At present, notebook computers are divided into two usage types, that is, general notebook computers, and notebook computers for industrial or military purposes (these kinds of electronic devices are referred to in the preferred embodiment and are explained, though it is to be understood that the invention is not limited thereto). An industry-oriented notebook computer is always used in a factory. For ease of use, it is seldom carried in a backpack. Usually, it is protected by a case much stronger than that of an ordinary notebook computer, and it is equipped with a handle for carrying.

[0003] Handles used to be only pivotally connected to a notebook computer. Hence, the angle at which a handle is held varies with the position of the center of gravity of the notebook computer. In addition, there is no fixation mechanism, so the handle has to be held at different angles for different positions of the center of gravity of the notebook computer, leading to great inconvenience.

[0004] Therefore, a user has little control over the angle at which the handle is held. In the event that the handle lies so close to the notebook computer connection ports that it gets in their way, it will prevent the connection ports from connecting to any peripheral device.

[0005] In view of this, to meet the users' demands it is necessary to design a mechanism for the rotation and positioning of a handle, so that it will be easy to hold the handle without hindering the connection of a connection port and a peripheral device.

### OBJECT AND SUMMARY OF THE INVENTION

[0006] The primary object of the invention is to provide a handle structure for an electronic device, so that a user may adjust the angle at which the handle is held and fix the handle at a specific angle.

[0007] The handle structure of electronic device disclosed by the invention comprises a handle, a base, a connector and a fastener. The base is installed beside the electronic device. The handle is fixed on the base and is able to rotate by means of the connector that passes through the holding hole of the base. There is a plurality of grooves on the circumferential surface of the connector. Corresponding to the grooves is the fastener inside the base. Through a spring piece, the fastener has at least one locking position in the normal state wherein it sticks into a groove so as to lock the handle, as well as one released position wherein it releases from the groove to allow the handle to rotate and change angles.

[0008] Whenever a user needs to adjust the angle at which the handle is held, the user may turn the handle so as to rotate the connector inside the base. When the rotation of the

connector is stopped at the intended angle, the fastener inside the base locks in the groove of the connector because of the compression of the spring inside the base. In this way, the object of angle adjustment and fixation of the handle is achieved.

[0009] To gain further insight into the object, the characteristics of the structure and the functions of the invention, illustrations and detailed explanations are given below:

### BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 depicts the preferred embodiment of the invention.

[0011] FIG. 2 shows how to assemble the handle of the invention.

[0012] FIGS. 3A-3B are the cross-section diagrams of the base of the invention.

[0013] FIGS. 4A-4D are the transverse cross-section diagrams of the connector of the invention.

[0014] FIG. 5 is the cross-section diagram of the embodiment for the base of the invention.

[0015] FIG. 6 is a diagram of another embodiment for the base of the invention.

[0016] FIG. 7 shows how to rotate the handle of the invention to an angle and fix the handle at the angle.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] As shown in FIGS. 1 and 2, the handle structure of electronic device disclosed by the invention comprises a handle 10 and a pair of bases 20. At each of the two ends of the base 20 are two through holes 23 & 23'. The pair of bases 20 is fixed on the notebook computer 70 by screws 26. The handle 10 is fixed to the pair of bases 20, as the connectors 30 insert into the holding holes 21 of the bases 20. There is a plurality of grooves 31 on the circumferential surface of the connectors 30 pivotally connected to the bases 20. The grooves 31 of the connector 30 may turn in a circle within the holding hole 21. The distance between any two grooves 31 determines the amount of angle adjustment for handle positioning.

[0018] As shown in FIGS. 3A and 3B, the holding hole 21, by which the base 20 and the connector 30 are connected, is equipped with a positioning hole 22. Inside the positioning hole 22 are the fastener 40 and the spring 50. At the open end of the positioning hole 22 is an intra-hexagonal screw 60 for the purpose of locking and fixing, so that the spring 50 presses on the fastener 40. When the handle 10 is rotated, it turns the connector 30 as well. As a result, the fastener 40 has at least one locking position in the normal state wherein it sticks into a groove 31 to lock the handle 10, as well as one released position wherein it releases from the groove 31 to allow the handle 10 to rotate and change angles.

[0019] Inside the positioning hole 22, the spring 50 presses on the fastener 40 and makes the fastener 40 lock in a groove 31 of the connector 30, so that the handle 10 is fixed at a specific angle.

[0020] The aforesaid embodiment shows that, as put forth by the invention, the base 20 is fixed in the proper position

of the notebook computer **70** by two screws **26**. Thus the fixing mechanism is not limited to the intra-hexagonal screw **60** illustrated in the aforesaid drawing. Instead, any fixation mechanism that can do the same job will suffice. For example, as shown in **FIG. 5**, one end of the base **20** has a rivet **24**, whereas the other end of the base **20** has a through hole **23**. The base **20** is fixed on the proper position of the notebook computer **70** by the rivet **24** first. Then the base **20** is locked on the notebook computer **70** with a screw **26**. This not only reduces the assembly time but also makes the invention easier to operate.

[0021] By the same token, there is a plurality of types for the groove **31** of the connector **30** to lock in the fastener **40** in a smooth manner. As shown in **FIGS. 4A-4D**, the transverse profile of the groove **31** can be round (see **FIG. 4A**), square (see **FIG. 4B**), V-shaped (see **FIG. 4C**) or dovetailed (see **FIG. 4D**). The aforesaid fastener **40** may also, by means of a pin **25** (see **FIG. 6**), achieve its fastening function as well as the aforesaid fastening mechanism or other equally effective fastening mechanisms.

[0022] Handles **10** used to be only pivotally connected to a notebook computer **70**. The handle **10** thus swung uncontrollably whenever the position of the center of gravity of the notebook computer **70** changed, causing inconvenience for holding. In addition, being merely pivotally connected to a base **20** without any fixing mechanism, the handle **10** may get too close to the connection ports **701** found behind the notebook computer **70**. If the notebook computer **70** is rested on the dock **71**, the handle **10** may also get too close to the notebook computer **70** and the connection ports **701** of the dock **71**, preventing the connection of the connection ports **701** and other peripheral devices.

[0023] As shown in **FIG. 7**, the handle structure of the electronic device disclosed by the invention comprises a handle **10** and bases **20** found at both ends of the handle **10**. The bases **20** are installed in suitable positions near the connection ports **701** behind the notebook computer **70**, for users to hold and carry the notebook computer **70**.

[0024] When the handle **10** can be fixed at a specific angle, it may be fixed to the other side opposite the connection ports **701**, so that it will not get too close to the connection ports **701**. Whenever the handle **10** rotates, it also turns the connector **30**. Turn the handle **10** to a required angle, and the spring **50** presses the fastener **40** which, in turn, locks into a groove **31** of the connector **30**. Being fixed to the side opposite the connection ports **701**, the handle **10** does not hinder the connection of the connection ports **701** and other peripheral devices. The angle adjustment and fixation of the handle **10** also enables a user to work with the notebook computer **70** in a comfortable, convenient manner when the notebook computer **70** is slanted at a specific angle.

[0025] Since the distance between any two grooves **31** of the connector **30** determines the rotation angle, the angle at which the handle **10** is held can be adjusted and fixed. Hence, the handle **10** becomes more convenient to hold, and it may not swing in an uncontrollable manner when the center of gravity of the notebook computer **70** changes. In addition, the handle **10** may not get too close to the con-

nection ports behind the notebook computer **70** to hinder the connection of the connection ports **701** and other peripheral devices.

[0026] The Effects Attained

[0027] The handle structure of electronic device disclosed by the invention has the following effects:

[0028] Users may fix the handle at an intended angle. The advantages are: the handle does not swing when the center of gravity of the notebook computer changes; it becomes easier and more convenient to hold the handle, avoiding any damage to the internal equipment of the notebook computer due to unnecessary vibration of the notebook computer. In addition, if users want to connect a peripheral device to one of the connection ports, the handle may be fixed to the opposite side of the connection ports so as to stay free of the connection port, making the connection process easier and faster.

[0029] While the invention has been described by way of example and in terms of a preferred embodiment, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.

What is claimed is:

1. A handle structure of a portable electronic device comprising:

a handle;

a base fixed to side of the electronic device and having a holding hole;

a connector having a plurality of grooves on the circumferential surface and penetrating said holding hole to fix to said handle for rotating said handle; and

a fastener having a spring to define one locking position inletting into said groove to lock said handle and one released position withdrawing from said groove to allow said handle to rotate and take a new angle.

2. The handle of electronic device of claim 1, wherein said connector having a plurality of round grooves on the surface.

3. The handle of electronic device of claim 1, wherein said connector having a plurality of square grooves on the surface.

4. The handle of electronic device of claim 1, wherein said connector having a plurality of V-shaped grooves on the surface.

5. The handle of electronic device of claim 1, wherein said connector having a plurality of dovetailed grooves on the surface.

6. The handle of electronic device of claim 1, wherein said spring is a compression spring.

7. The handle of electronic device of claim 1, wherein said fastener is a steel ball.

8. The handle of electronic device of claim 1, wherein said fastener is a cylindrical bolt.

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