US 20190050028A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2019/0050028 A1

Chung et al. (43) Pub. Date: Feb. 14, 2019

(54) **HINGE STRUCTURE, ELECTRONIC DEVICE AND ASSEMBLING METHOD OF HINGE STRUCTURE**

(71) Applicants: **Ming-Hung Chung**, Taipei City (TW); **You-Yu Chen**, Taipei City (TW); **Chia-Huang Chan**, Taipei City (TW)

(72) Inventors: **Ming-Hung Chung**, Taipei City (TW); **You-Yu Chen**, Taipei City (TW); **Chia-Huang Chan**, Taipei City (TW)

(73) Assignee: **COMPAL ELECTRONICS, INC.**, Taipei City (TW)

(21) Appl. No.: **15/905,825**

(22) Filed: **Feb. 27, 2018**

Related U.S. Application Data

(60) Provisional application No. 62/544,889, filed on Aug. 13, 2017.

Publication Classification

(51) **Int. Cl.**

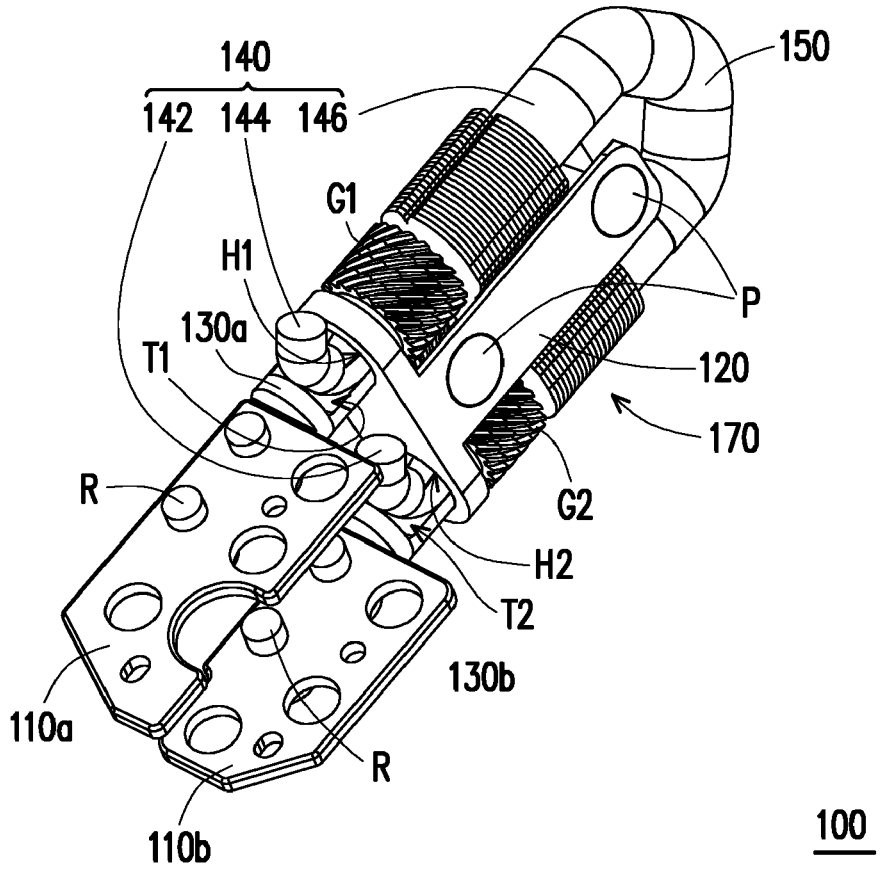
G06F 1/16	(2006.01)
F16C 11/04	(2006.01)
E05D 3/12	(2006.01)
E05D 11/00	(2006.01)

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

CPC ***G06F 1/1681*** (2013.01); ***F16C 11/04*** (2013.01); ***E05D 3/122*** (2013.01); *F16C 11/103* (2013.01); *E05Y 2600/50* (2013.01); *E05Y 2900/606* (2013.01); *E05D 11/0054* (2013.01); ***E05D 11/0081*** (2013.01)

(57) **ABSTRACT**

A hinge structure includes a pivot bracket, a first shaft, a second shaft, and a cable. The first shaft is pivoted to the pivot bracket and has a first through hole. The second shaft is pivoted to the pivot bracket and has a second through hole. The cable includes a first penetrating segment, a second penetrating segment, and a curved segment. The first penetrating segment penetrates through the first through hole, the second penetrating segment penetrates through the second through hole, and two ends of the curved segment are respectively connected to the first penetrating segment and the second penetrating segment. In addition, an electronic device including the hinge structure and an assembling method of the hinge structure are also provided.



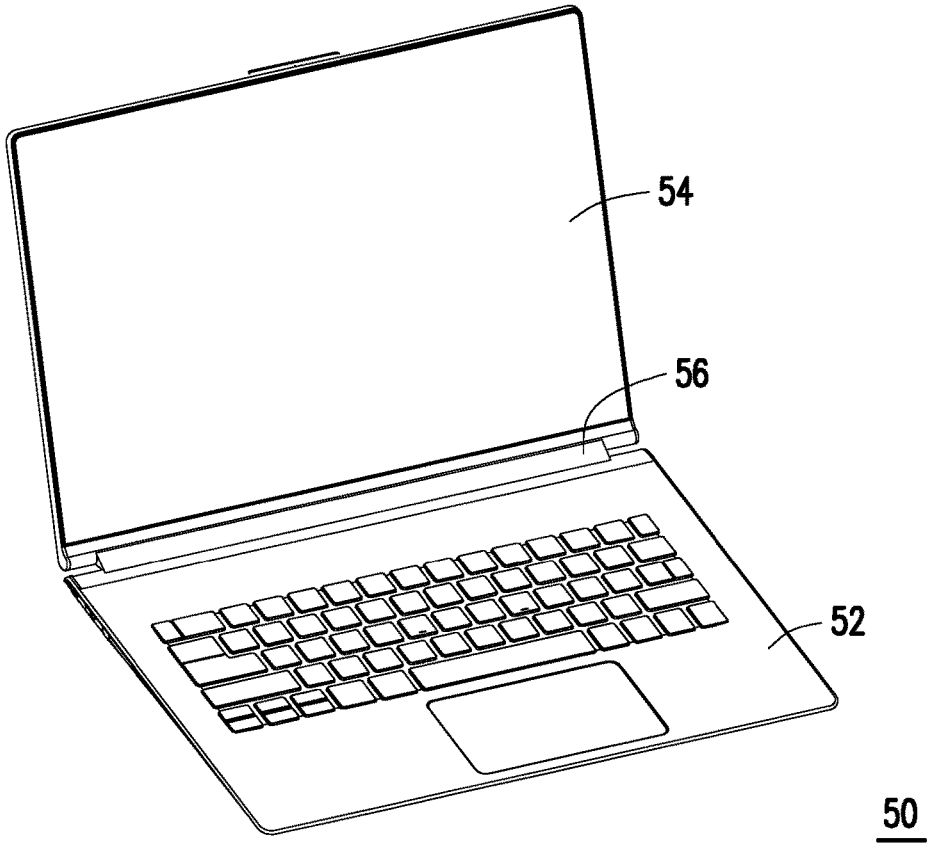


FIG. 1

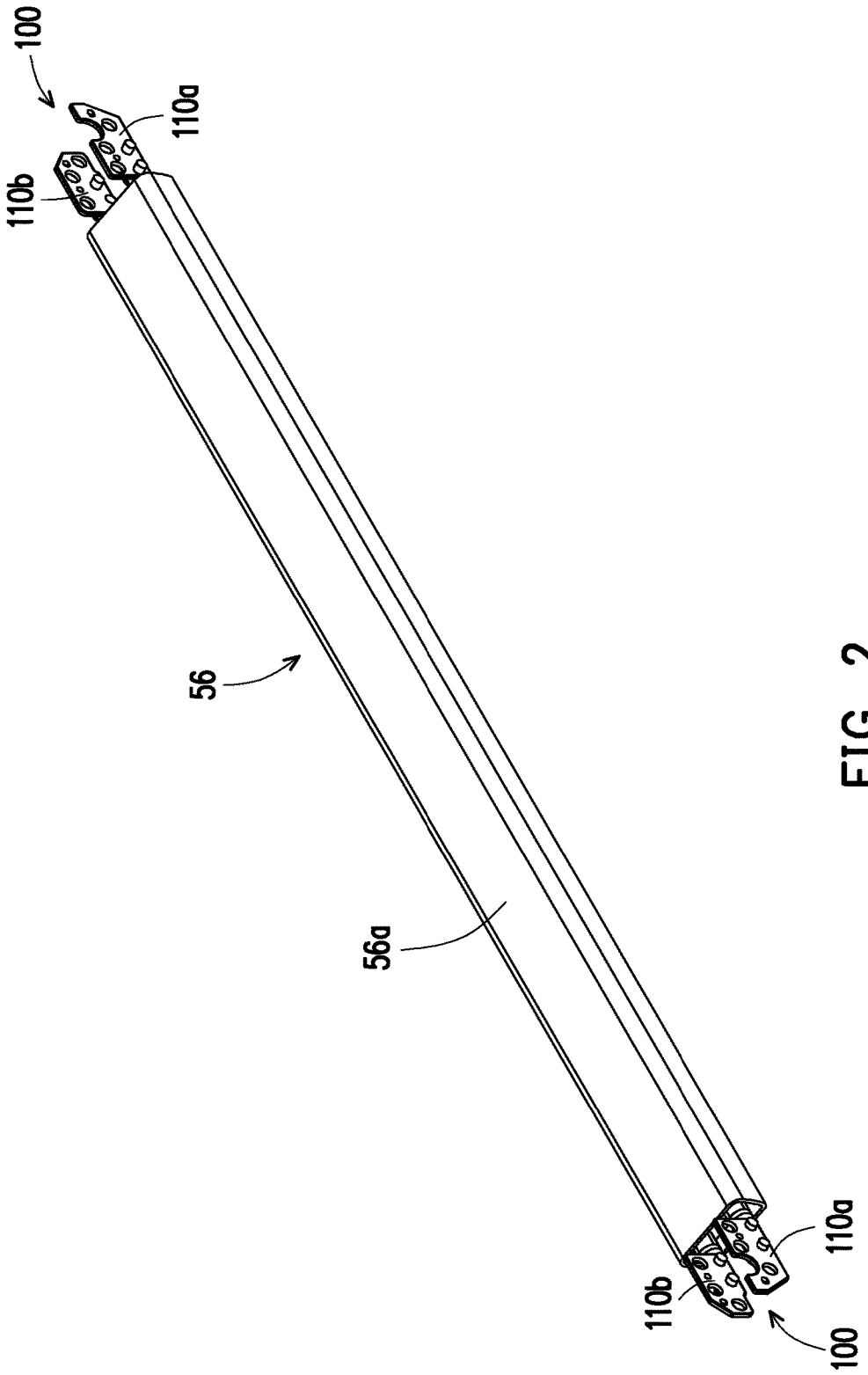


FIG. 2

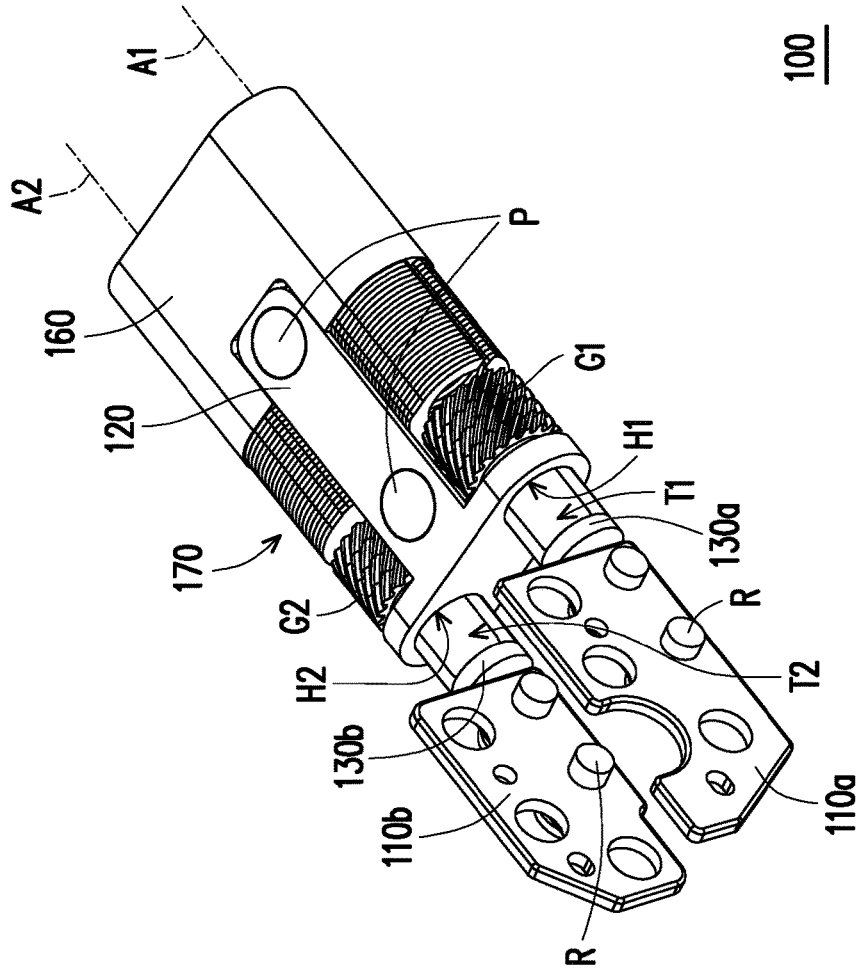


FIG. 3

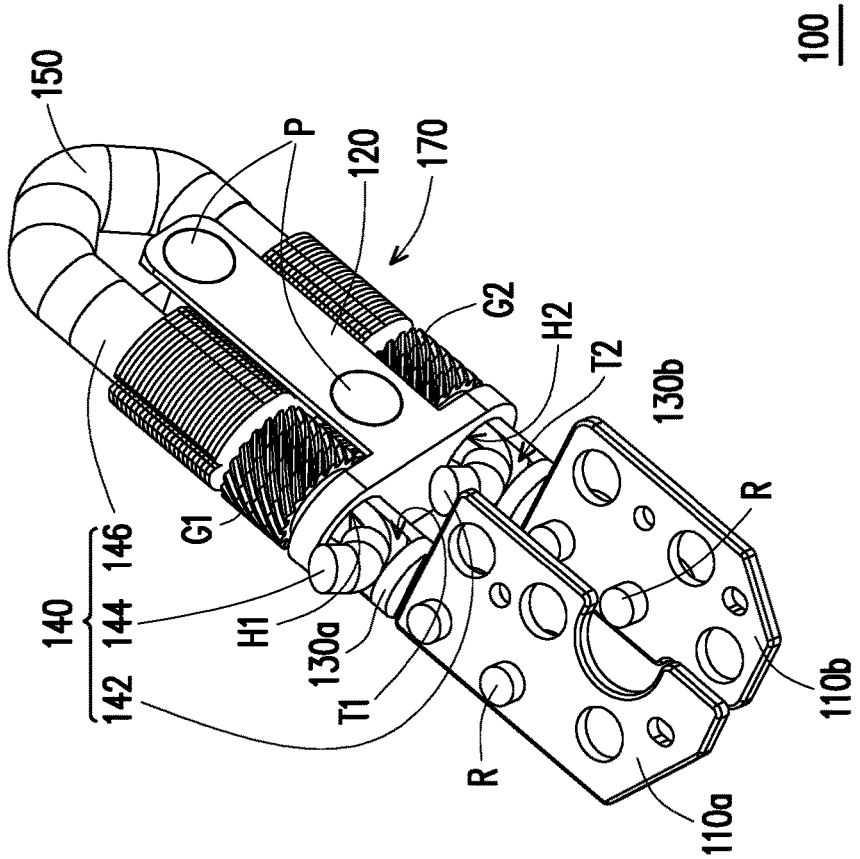

100
150
P
120
170
G2
H2
T2
130b
R
G1
146
140
144
142
H1
130a
T1
R
110b
110a

FIG. 4

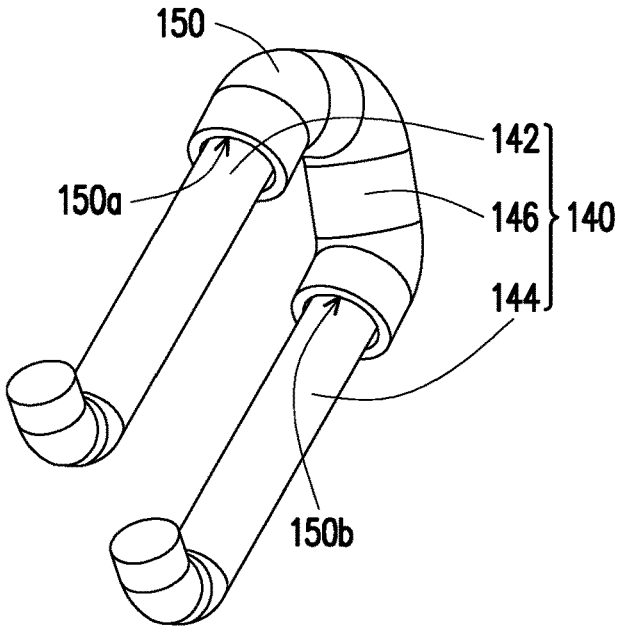


FIG. 5

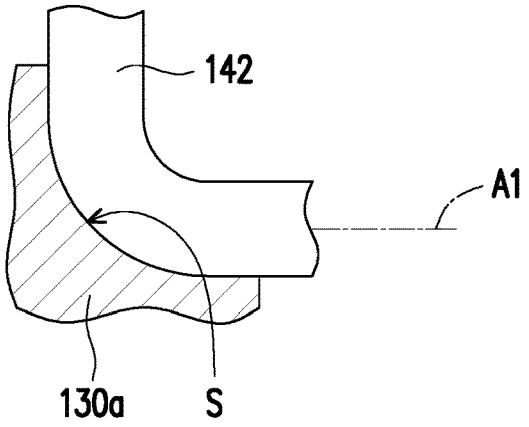


FIG. 6

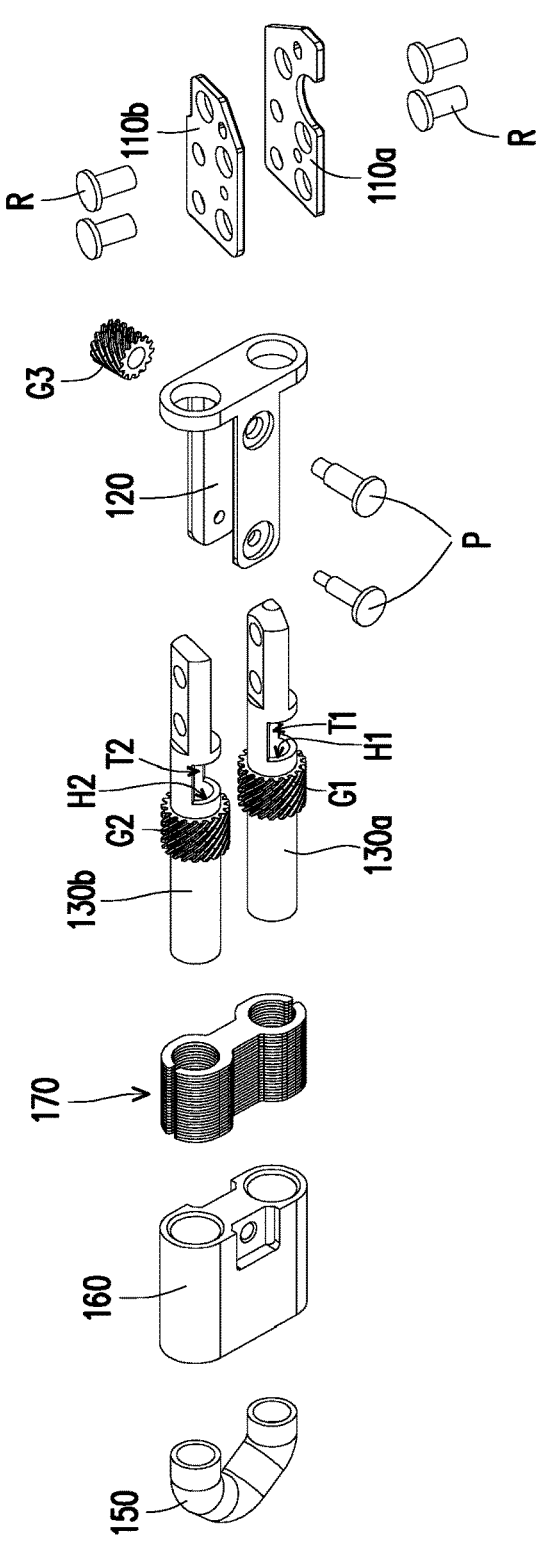


FIG. 7

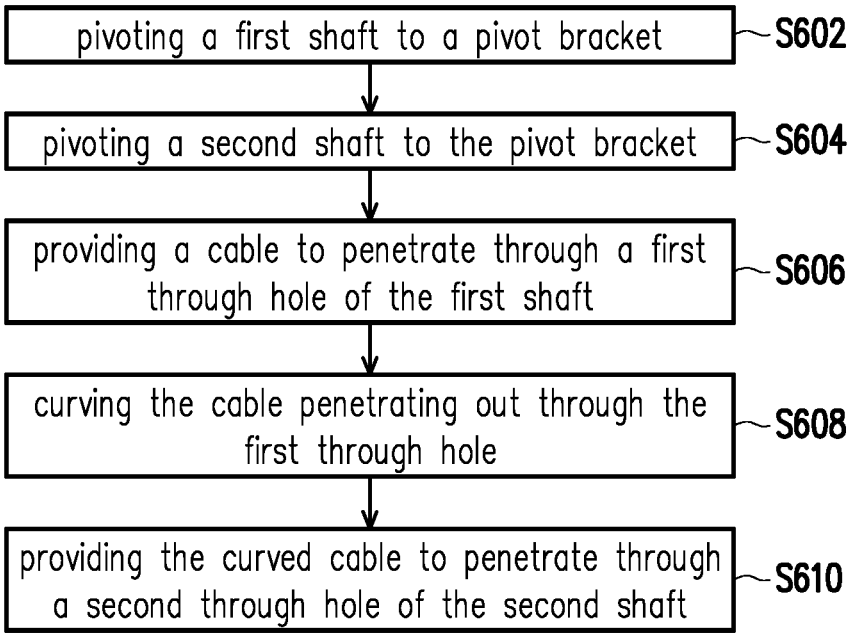

pivoting a first shaft to a pivot bracket
S602
pivoting a second shaft to the pivot bracket
S604
providing a cable to penetrate through a first through hole of the first shaft
S606
curving the cable penetrating out through the first through hole
S608
providing the curved cable to penetrate through a second through hole of the second shaft
S610

FIG. 8

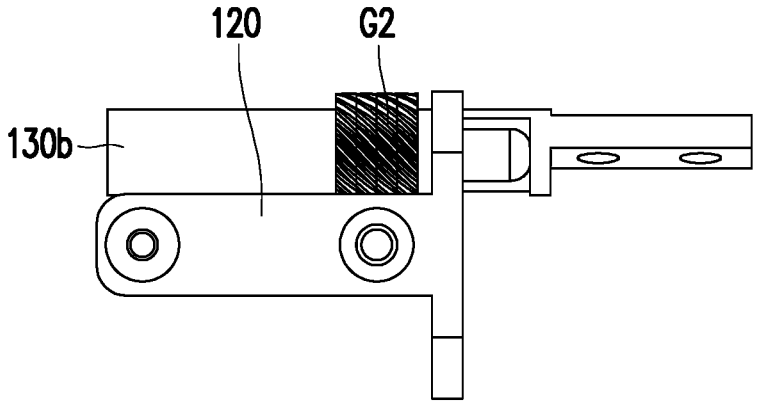


FIG. 9A

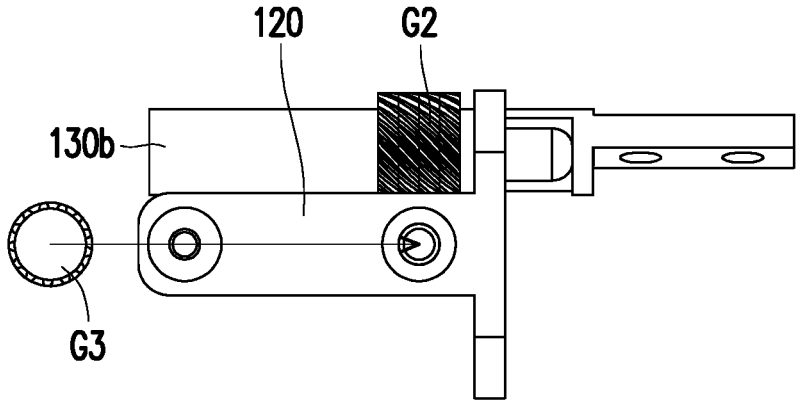


FIG. 9B

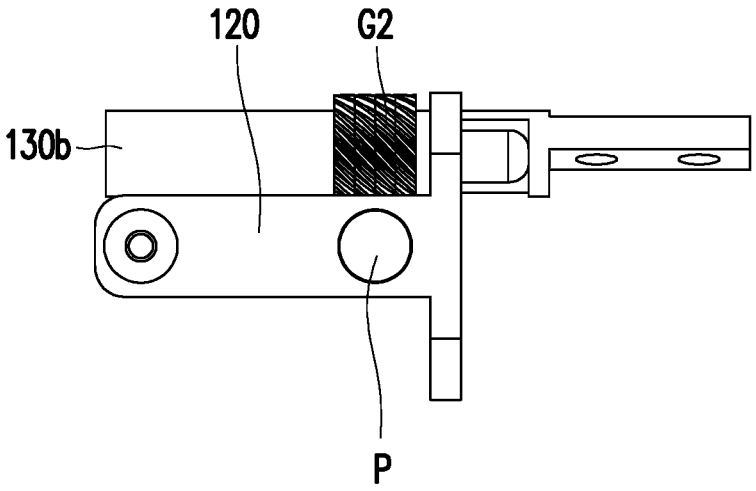


FIG. 9C

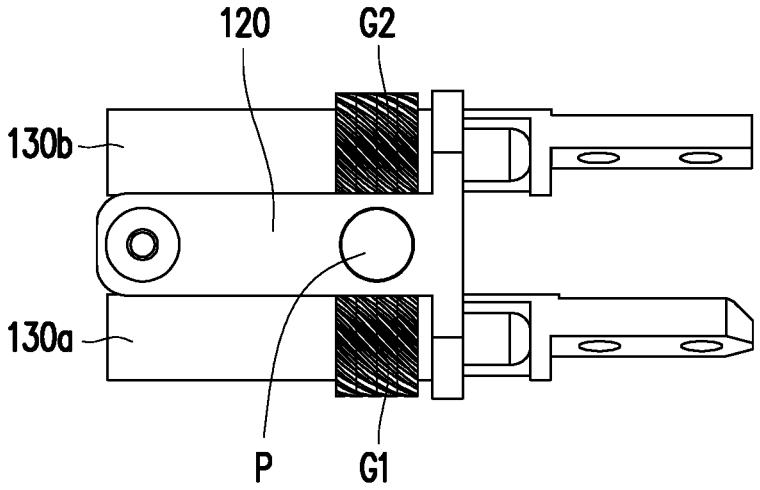


FIG. 9D

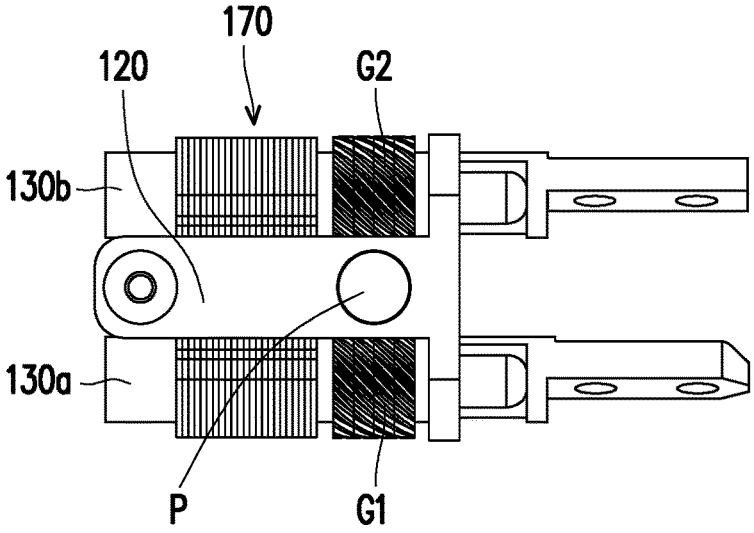


FIG. 9E

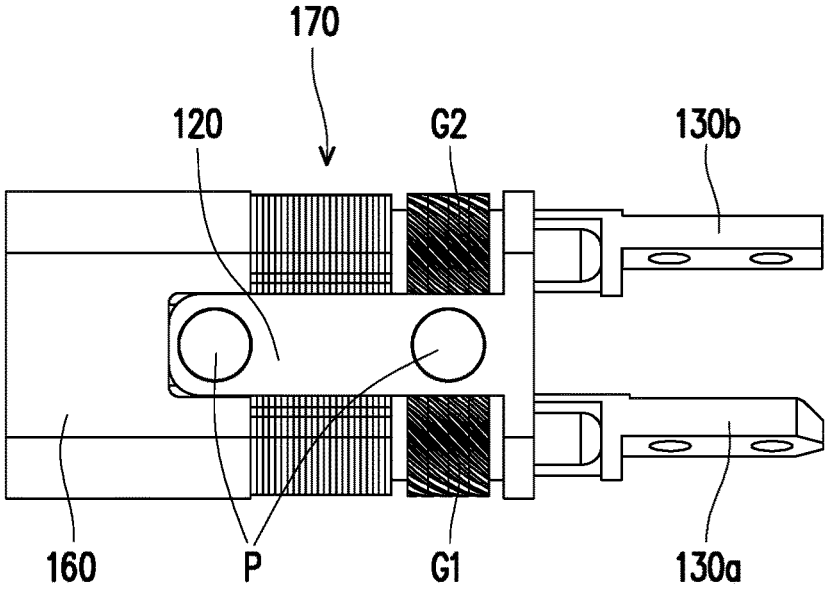


FIG. 9F

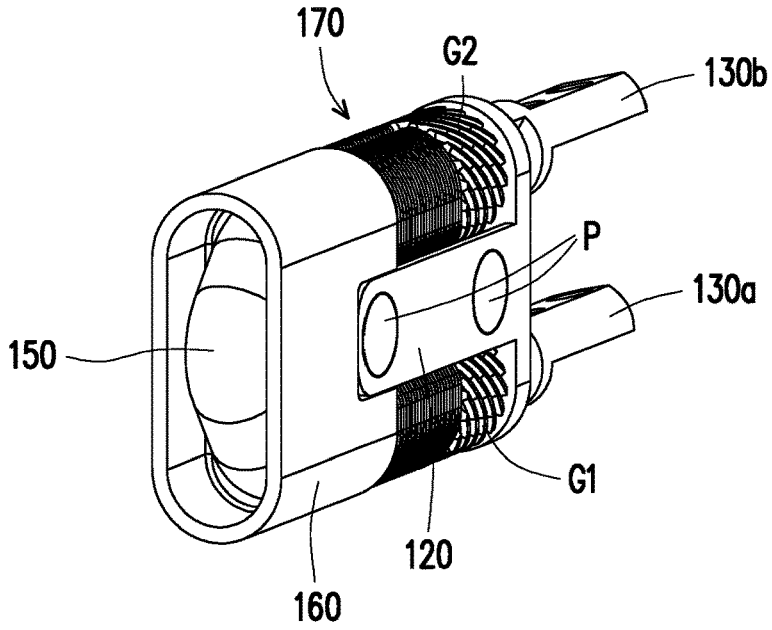

170
G2
130b
P
130a
150
G1
120
160

FIG. 9G

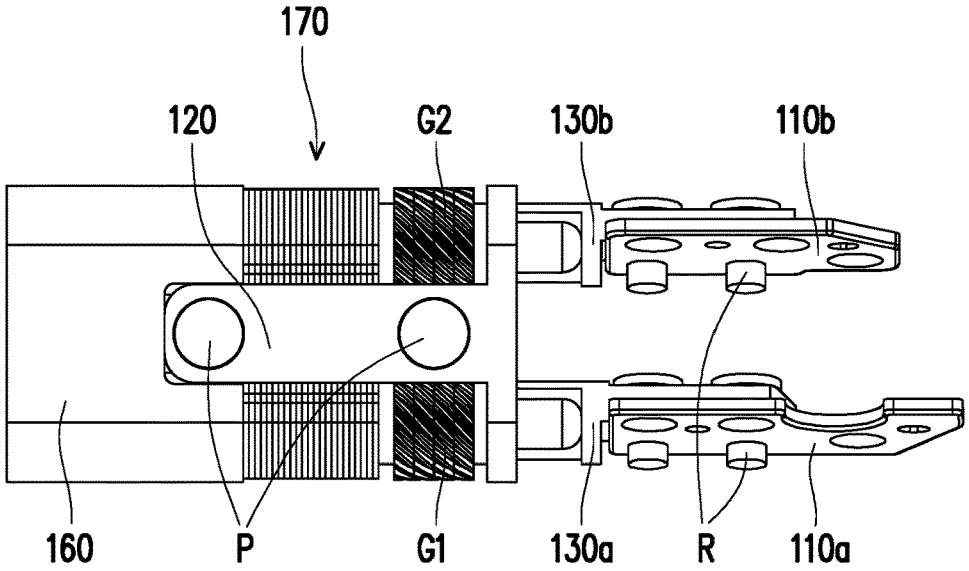

170
120
G2
130b
110b
160
P
G1
130a
R
110a

FIG. 9H

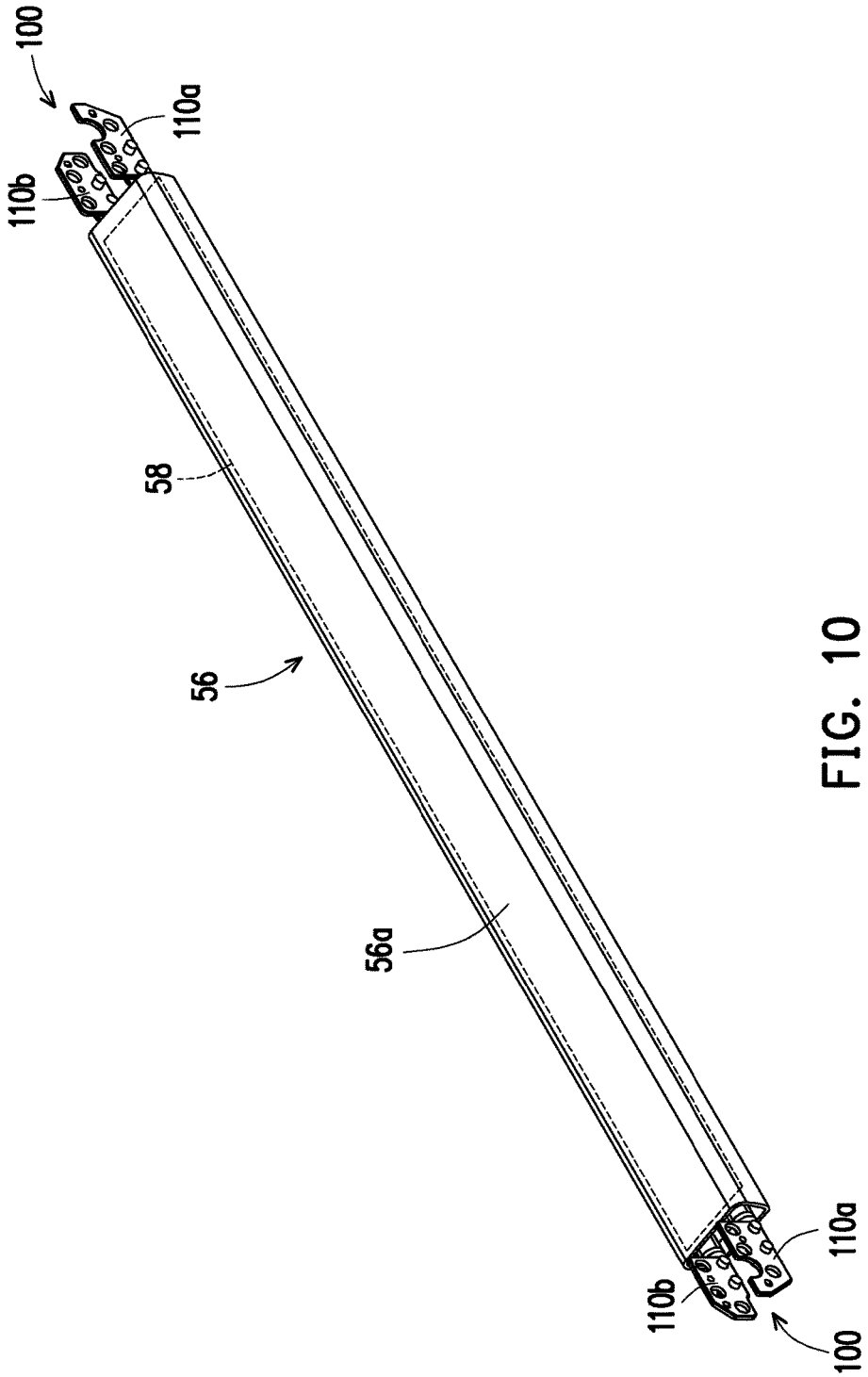


FIG. 10

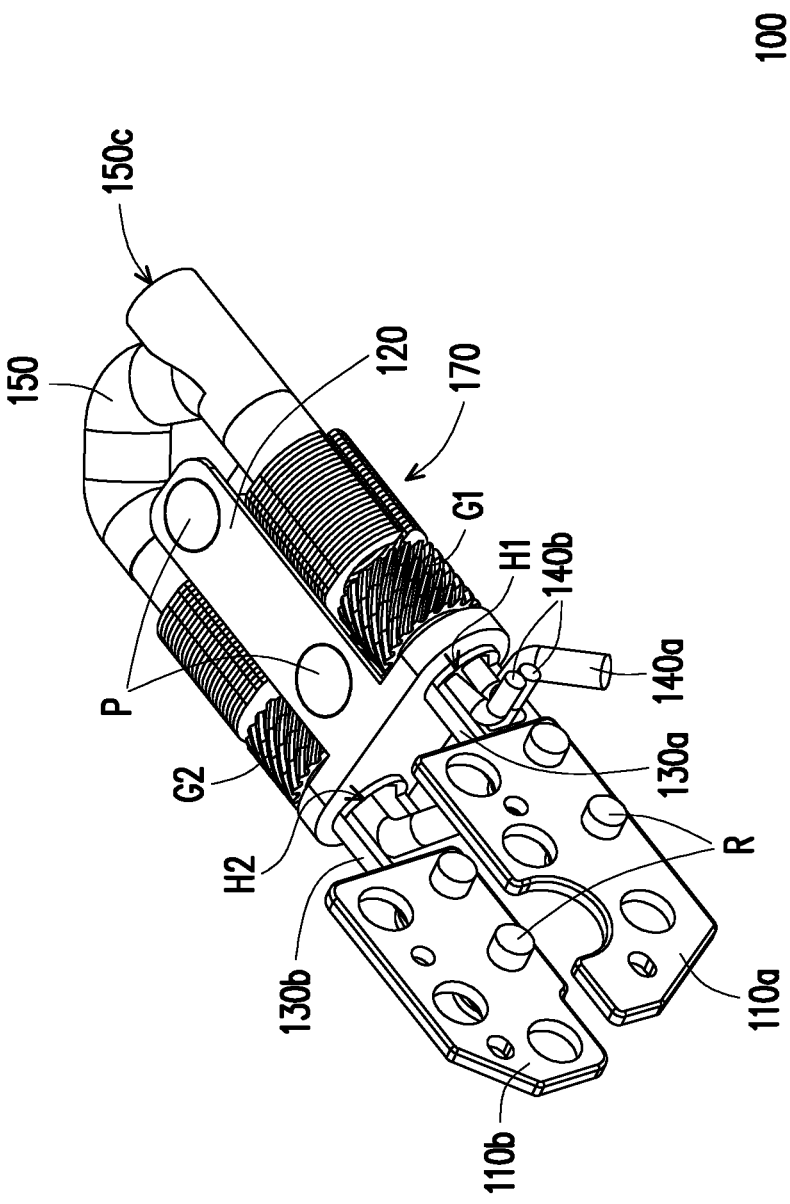

100
150c
150
120
170
G1
H1
140b
140a
130a
R
110a
P
G2
H2
130b
110b

FIG. 11

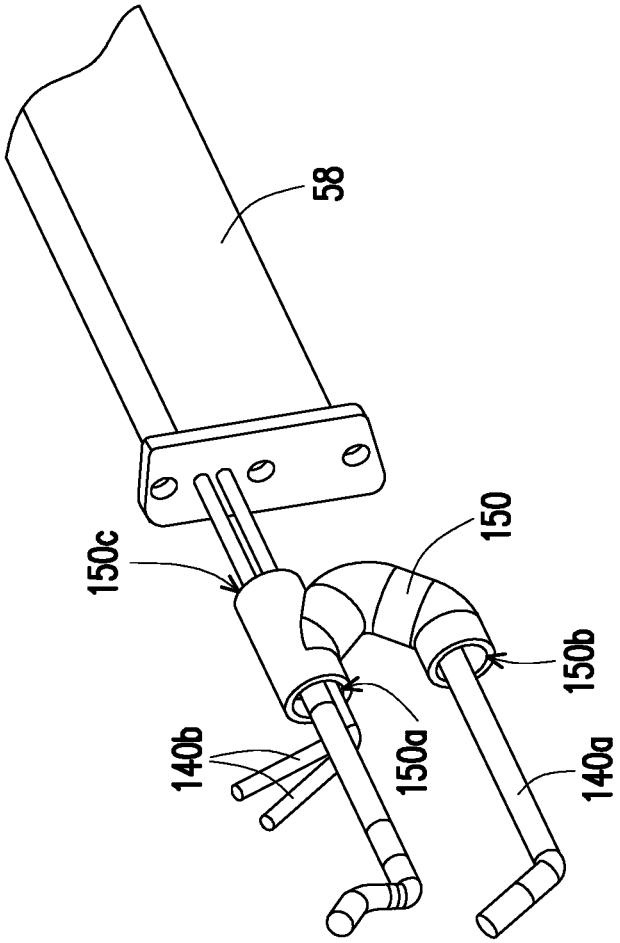


FIG. 12

HINGE STRUCTURE, ELECTRONIC DEVICE AND ASSEMBLING METHOD OF HINGE STRUCTURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the priority benefits of U.S. provisional application Ser. No. 62/544,889, filed on Aug. 13, 2017. The entirety of the above-mentioned patent application is hereby incorporated by reference herein and made a part of this specification.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The invention relates to a hinge structure, an electronic device, and an assembling method of the hinge structure. More particularly, the invention relates to a hinge structure having dual shafts, an electronic device including the hinge structure, and an assembling method of the hinge structure.

2. Description of Related Art

[0003] A notebook computer is generally composed of a host and a display. In order to allow the notebook computers to be operated and used in diverse manners to satisfy users' needs, the displays of some notebook computers can be flipped over to the rear sides of the hosts, so that the notebook computers can be used as tablet computers. Accordingly, the hinge structures of some of the notebook computers are designed to have dual shafts. As such, the notebook computers can be pivoted at large angles by the users through the dual shafts, and that the displays of the notebook computers may be flipped over to the rear sides of the hosts. In another aspect, a cable connected between the host and the display is required to be designed to pass through the hinge structure. When the hinge structure is designed to have the dual shafts as described above and is configured for large-angle pivoting, how the cable can be designed to occupy less allocation space in the hinge structure and to be prevented from being excessively twisted as affected by large-angle pivoting is an important issue in the design of the hinge structure.

SUMMARY OF THE INVENTION

[0004] The invention provides a hinge structure in which an allocation space is saved and a cable passing through the hinge structure is prevented from being excessively twisted along with pivoting of the hinge structure.

[0005] In an embodiment of the invention, a hinge structure includes a pivot bracket, a first shaft, a second shaft, and a cable. The first shaft is pivoted to the pivot bracket and has a first through hole. The second shaft is pivoted to the pivot bracket and has a second through hole. The cable includes a first penetrating segment, a second penetrating segment, and a curved segment. The first penetrating segment penetrates through the first through hole, the second penetrating segment penetrates through the second through hole, and two ends of the curved segment are respectively connected to the first penetrating segment and the second penetrating segment.

[0006] The invention also provides an electronic device including a host, a display, and a hinge structure. The hinge structure includes a pivot bracket, a first shaft, a second shaft, and a cable. The first shaft is pivoted to the pivot bracket and has a first through hole, and the first shaft is connected to the host. The second shaft is pivoted to the pivot bracket and has a second through hole, and the second shaft is connected to the display. The cable includes a first penetrating segment, a second penetrating segment, and a curved segment. The first penetrating segment penetrates through the first through hole, the second penetrating segment penetrates through the second through hole, and two ends of the curved segment are respectively connected to the first penetrating segment and the second penetrating segment.

[0007] In an embodiment of the invention, the first shaft is pivoted to the pivot bracket along a first axis, the second shaft is pivoted to the pivot bracket along a second axis, and the first axis is parallel to the second axis.

[0008] In an embodiment of the invention, the first through hole extends along the first axis, and the second through hole extends along the second axis.

[0009] In an embodiment of the invention, the hinge structure includes a first holder and a second holder. The first holder is connected to the first shaft, and the first shaft is connected to the host through the first holder. The second holder is connected to the second shaft, and the second shaft is connected to the display through the second holder.

[0010] In an embodiment of the invention, the pivot bracket is located between the first holder and the curved segment and is located between the second holder and the curved segment.

[0011] In an embodiment of the invention, the first shaft has a first groove, and the second shaft **130***b* has a second groove. The first groove is located between the first holder and the first through hole, and the second groove is located between the second holder and the second through hole. The first penetrating segment extends to the first groove and curves in the first groove to extend to an outside of the first shaft, and the second penetrating segment extends to the second groove and curves in the second groove to extend to an outside of the second shaft.

[0012] In an embodiment of the invention, the first groove has a first arc-shaped surface inside, and the second groove has a second arc-shaped surface inside.

[0013] In an embodiment of the invention, the hinge structure includes an elastic tube. The elastic tube has a first opening and a second opening opposite to each other. The first opening and the second opening are respectively connected to the first through hole and the second through hole. The curved segment is located in the elastic tube.

[0014] In an embodiment of the invention, the hinge structure includes another cable. The elastic tube has a third opening. The another cable penetrates through the first through hole and passes through the first opening and the third opening.

[0015] The invention further provides an assembling method of a hinge structure which includes following steps. A first shaft is pivoted to a pivot bracket. A second shaft is pivoted to the pivot bracket. A cable is provided to penetrate through a first through hole of the first shaft. The cable penetrating out through the first through hole is curved. The curved cable is provided to penetrate through a second through hole of the second shaft.

[0016] In an embodiment of the invention, the assembling method of the hinge structure includes following steps. Two

ends of an elastic tube are respectively connected to the first through hole and the second through hole. The cable penetrating out through the first through hole is provided to penetrate through the elastic tube to reach the second through hole.

[0017] To sum up, in the hinge structure provided by the embodiments of the invention, the first shaft and the second shaft both have the through holes and thus are hollow shafts. The cable passing through the hinge structure may thereby penetrate through the first shaft and the second shaft. As such, the cable does not excessively occupy the allocation space outside the first shaft and the second shaft. In addition, the cable penetrates through the first shaft and the second shaft and extends respectively along the rotating axes. Therefore, when the first shaft and the second shaft are pivoted, considerable shifting of the cable winding around the rotating axes is not generated, and the cable is thus prevented from being excessively twisted along with pivoting of the first shaft and the second shaft.

[0018] To make the aforementioned and other features and advantages of the invention more comprehensible, several embodiments accompanied with drawings are described in detail as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings are included to provide a further understanding of the invention, and are incorporated in and constitute a part of this specification. The drawings illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

[0020] FIG. **1** is a three-dimensional view of an electronic device according to an embodiment of the invention.

[0021] FIG. **2** is a three-dimensional view of the pivot assembly of FIG. **1**.

[0022] FIG. **3** is a three-dimensional view of part of components of the hinge structure of FIG. **2**.

[0023] FIG. **4** is a three-dimensional view of part of the components of the hinge structure of FIG. **3**.

[0024] FIG. **5** is a three-dimensional view of a cable and an elastic tube of FIG. **3**.

[0025] FIG. **6** is a local schematic view of the first shaft in the first groove of FIG. **3**.

[0026] FIG. **7** is an exploded view of part of the components of the hinge structure of FIG. **3**.

[0027] FIG. **8** is a flowchart of an assembling method of a hinge structure according to an embodiment of the invention.

[0028] FIG. **9**A to FIG. **9**H illustrate the assembling process of the hinge structure of FIG. **3**.

[0029] FIG. **10** is a three-dimensional view of a pivot assembly according to another embodiment of the invention.

[0030] FIG. **11** is a three-dimensional view of part of components of a hinge structure of FIG. **10**.

[0031] FIG. **12** is a three-dimensional view of part of components of the pivot assembly of FIG. **10**.

DESCRIPTION OF THE EMBODIMENTS

[0032] Reference will now be made in detail to the present preferred embodiments of the disclosure, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

[0033] FIG. **1** is a three-dimensional view of an electronic device according to an embodiment of the invention. With reference to FIG. **1**, an electronic device **50** of this embodiment is, for example, a notebook computer and includes a host **52**, a display **54**, and a pivot assembly **56**. The host **52** and the display **54** are pivoted to each other through the pivot assembly **56**.

[0034] FIG. **2** is a three-dimensional view of the pivot assembly of FIG. **1**. With reference to FIG. **2**, the pivot assembly **56** includes a housing **56***a* and two hinge structures **100**. The housing **56***a* covers a portion of a structure of each of the hinge structures **100**. A first holder **110***a* and a second holder **110***b* of each of the hinge structures **100** are respectively configured to connect the host **52** and the display **54**.

[0035] FIG. **3** is a three-dimensional view of part of components of the hinge structure of FIG. **2**. FIG. **4** is a three-dimensional view of part of the components of the hinge structure of FIG. **3**. FIG. **5** is a three-dimensional view of a cable and an elastic tube of FIG. **3**. In order to have a clearer figure, a cable **140** is not illustrated in FIG. **3**, and a fixing cover **160** is not illustrated in FIG. **4**. With reference to FIG. **3** to FIG. **5**, the hinge structure **100** includes a pivot bracket **120**, a first shaft **130***a*, a second shaft **130***b*, and the cable **140**. The first shaft **130***a* is pivoted to the pivot bracket **120** along a first axis A**1** and has a first through hole H**1** extending along the first axis A**1**. The second shaft **130***b* is pivoted to the pivot bracket **120** along a second axis A**2** parallel to the first axis A**1** and has a second through hole H**2** extending along the second axis A**2**. The first holder **110***a* and the second holder **110***b* are respectively connected to the first shaft **130***a* and the second shaft **130***b*. The first shaft **130***a* is connected to the host **52** (illustrated in FIG. **1**) through the first holder **110***a*. The second shaft **130***b* is connected to the display **54** (illustrated in FIG. **1**) through the second holder **110***b*.

[0036] The cable **140** includes a first penetrating segment **142**, a second penetrating segment **144**, and a curved segment **146**. The first penetrating segment **142** penetrates through the first through hole H**1** of the first shaft **130***a*, and the second penetrating segment **144** penetrates through the second through hole H**2** of the second shaft **130***b*. Two ends of the curved segment **146** are respectively connected to the first penetrating segment **142** and the second penetrating segment **144**. The first penetrating segment **142** and the second penetrating segment **144** are respectively connected to the host **52** (illustrated in FIG. **1**) end and the display **54** (illustrated in FIG. **1**) end. The pivot bracket **120** is located between the first holder **110***a* and the curved segment **146** and is located between the second holder **110***b* and the curved segment **146**.

[0037] As described above, the first shaft **130***a* and the second shaft **130***b* respectively have the first through hole H**1** and the second through hole H**2**; thus, the first shaft **130***a* and the second shaft **130***b* are hollow shafts. The cable **140** passing through the hinge structure **100** may thereby penetrate through the first shaft **130***a* and the second shaft **130***b*. As such, the cable **140** does not excessively occupy an allocation space outside the first shaft **130***a* and the second shaft **130***b*. Besides, the cable **140** penetrates through the first shaft **130***a* and the second shaft **130***b* and extends respectively along the first axis A**1** and the second axis A**2**. As such, when the first shaft **130***a* and the second shaft **130***b* are pivoted, considerable shifting of the cable **140** winding

around the first axis A1 and the second axis A2 is not generated, and the cable **140** is thus prevented from being excessively twisted along with pivoting of the first shaft **130***a* and the second shaft **130***b*.

[0038] In addition, the hinge structure **100** of this embodiment includes an elastic tube **150** and a fixing cover **160**. The elastic tube **150** is, for example, a rubber tube body and has first opening **150***a* and a second opening **150***b* opposite to each other. The first opening **150***a* and the second opening **150***b* are respectively connected to the first through hole H1 of the first shaft **130***a* and the second through hole H2 of the second shaft **130***b*. The curved segment **146** of the cable **140** is located in the elastic tube **150**, and the fixing cover **160** covers the elastic tube **150**. As the elastic tube **150** is elastic, the cable **140** is thereby prevented from being disposed in an excessively tight state. In addition, the cable **140** is covered by the elastic tube **150** and the fixing cover **160**, and thus, the cable **140** is prevented from being unexpectedly wound around other components in an assembling process.

[0039] In this embodiment, the first shaft **130***a* has a first groove T1, and the second shaft **130***b* has a second groove T2. The first groove T1 is located between the first holder **110***a* and the first through hole H1, and the second groove T2 is located between the second holder **110***b* and the second through hole H2. The first penetrating segment **142** of the cable **140** extends to the first groove T1 and curves in the first groove T1 to extend to an outside of the first shaft **130***a*, and the second penetrating segment **144** of the cable **140** extends to the second groove T2 and curves in the second groove T2 to extend to an outside the second shaft **130***b*. FIG. **6** is a local schematic view of the first shaft in the first groove of FIG. **3**. With reference to FIG. **6**, the first groove T1 (shown in FIG. **3** and FIG. **4**) of this embodiment has a first arc-shaped surface S inside, and the first penetrating segment **142** of the cable **140** may bend along with the first arc-shaped surface S. Similarly, the second groove T1 (shown in FIG. **3** and FIG. **4**) of this embodiment has a second arc-shaped surface inside, and the second penetrating segment **144** of the cable **140** may bend along with the second arc-shaped surface. Since the second arc-shaped surface in the second groove T2 is similar to the first arc-shaped surface S in the first groove T1, the second arc-shaped surface is not additionally illustrated herein.

[0040] The rest of the structure of the hinge structure **100** is described as follows. FIG. **7** is an exploded view of part of the components of the hinge structure of FIG. **3**. With reference to FIG. **3**, FIG. **4**, and FIG. **7**, the first shaft **130***a* has a first gear G1, and the second shaft **130***b* has a second gear G2. An idle wheel G3 is engaged between the first gear G1 and the second gear G2. It thus can be seen that the first shaft **130***a* and the second shaft **130***b* are linked up and are pivoted to each other in opposite directions through the first gear G1, the second gear G2, and the idle wheel G3. Besides, a torsion spring set **170** is sleeved on the first shaft **130***a* and the second shaft **130***b* and is fixed by the fixing cover **160** for providing a torsion force required by the hinge structure **100**. Moreover, the first holder **110***a* and the second holder **110***b* are respectively assembled to the first shaft **130***a* and the second shaft **130***b* through rivets R, and the fixing cover **160** and the idle wheel G3 are assembled to the pivot bracket **120** through pins P.

[0041] FIG. **8** is a flowchart of an assembling method of a hinge structure according to an embodiment of the invention. With reference to FIG. **8**, a first shaft is pivoted to a pivot bracket (step S602). A second shaft is pivoted to the pivot bracket (step S604). A cable is provided to penetrate through a first through hole of the first shaft (step S606). The cable penetrating out through the first through hole is curved (step S608). The curved cable is provided to penetrate through a second through hole of the second shaft (step S610).

[0042] The hinge structure **100** shown in FIG. **3** to FIG. **7** is taken as an example, and an assembling process of the hinge structure is described in detail as follows. FIG. **9**A to FIG. **9**H illustrate the assembling process of the hinge structure of FIG. **3**. First, the second shaft **130***b* is pivoted to the pivot bracket **120** as shown in FIG. **9**A. Next, the idle wheel G3 is moved into the pivot bracket **120** as shown by the arrow in FIG. **9**B. The idle wheel G3 (illustrated in FIG. **9**B) is assembled to the pivot bracket **120** through the pin P as shown in FIG. **9**C. As shown in FIG. **9**D, the first shaft **130***a* is pivoted to the pivot bracket **120**, and at this time, the idle wheel G3 is engaged between the first gear G1 of the first shaft **130***a* and the second gear G2 of the second shaft **130***b*. As shown in FIG. **9**E, the torsion spring set **170** is sleeved on the first shaft **130***a* and the second shaft **130***b*. As shown in FIG. **9**F, the fixing cover **160** is mounted to the pivot bracket **120** to fix the torsion spring set **170**, and the fixing cover **160** is fixed to the pivot bracket **120** through the other pin P. As shown in FIG. **9**G, the elastic tube **150** is mounted into the fixing cover **160**, two ends of the elastic tube **150** are thereby respectively connected to the first through hole H1 (shown in FIG. **3** and FIG. **4**) of the first shaft **130***a* and the second through hole H2 (shown in FIG. **3** and FIG. **4**) of the second shaft **130***b*. As shown in FIG. **9**H, the first holder **110***a* and the second holder **110***b* are respectively assembled to the first shaft **130***a* and the second shaft **130***b* through the rivets R. Finally, the cable **140** is inserted in the first shaft **130***a*, the elastic tube **150**, and the second shaft **130***b* as shown in FIG. **4**. For instance, the cable **140** penetrating out through the first through hole H1 (shown in FIG. **3** and FIG. **4**) is provided to penetrate through the elastic tube **150** to reach the second through hole H2 (shown in FIG. **3** and FIG. **4**).

[0043] FIG. **10** is a three-dimensional view of a pivot assembly according to another embodiment of the invention. FIG. **11** is a three-dimensional view of part of components of a hinge structure of FIG. **10**. FIG. **12** is a three-dimensional view of part of components of the pivot assembly of FIG. **10**. A difference between the embodiment illustrated in FIG. **10** to FIG. **12** and the embodiment illustrated in FIG. **1** to FIG. **7** includes that an antenna **58** is disposed in the pivot assembly **56**, and two cables **140***a* and **140***b* are included in the hinge structure **100**. The configuration and operation of the cable **140***a* is similar to the configuration and operation of the cable **140** of FIG. **4**. The elastic tube **150** further includes a third opening **150***c*. The cable **140***b* penetrates through the first through hole H1 and passes through the first opening **150***a* and the third opening **150***c*, as such, the cable **140***b* may be connected between the antenna **58** and the host **52** (illustrated in FIG. **1**) end.

[0044] It will be apparent to those skilled in the art that various modifications and variations can be made to the structure of the present invention without departing from the scope or spirit of the invention. In view of the foregoing, it is intended that the present invention cover modifications and variations of this invention provided they fall within the scope of the following claims and their equivalents.

What is claimed is:

1. A hinge structure, comprising:

a pivot bracket;

a first shaft, pivoted to the pivot bracket and having a first through hole;

a second shaft, pivoted to the pivot bracket and having a second through hole; and

a cable, comprising a first penetrating segment, a second penetrating segment, and a curved segment, wherein the first penetrating segment penetrates through the first through hole, the second penetrating segment penetrates through the second through hole, and two ends of the curved segment are respectively connected to the first penetrating segment and the second penetrating segment.

2. The hinge structure as claimed in claim **1**, wherein the first shaft is pivoted to the pivot bracket along a first axis, the second shaft is pivoted to the pivot bracket along a second axis, and the first axis is parallel to the second axis.

3. The hinge structure as claimed in claim **2**, wherein the first through hole extends along the first axis, and the second through hole extends along the second axis.

4. The hinge structure as claimed in claim **1**, adapted for an electronic device and comprising a first holder and a second holder, wherein the first holder is connected to the first shaft, the first shaft is adapted for being connected to a host of the electronic device through the first holder, the second holder is connected to the second shaft, and the second shaft is adapted for being connected to a display of the electronic device through the second holder.

5. The hinge structure as claimed in claim **4**, wherein the pivot bracket is located between the first holder and the curved segment and is located between the second holder and the curved segment.

6. The hinge structure as claimed in claim **4**, wherein the first shaft has a first groove, the second shaft has a second groove, the first groove is located between the first holder and the first through hole, the second groove is located between the second holder and the second through hole, the first penetrating segment extends to the first groove and curves in the first groove to extend to an outside of the first shaft, and the second penetrating segment extends to the second groove and curves in the second groove to extend to an outside of the second shaft.

7. The hinge structure as claimed in claim **6**, wherein the first groove has a first arc-shaped surface inside, and the second groove has a second arc-shaped surface inside.

8. The hinge structure as claimed in claim **1**, comprising an elastic tube, the elastic tube having a first opening and a second opening opposite to each other, the first opening and the second opening being respectively connected to the first through hole and the second through hole, the curved segment being located in the elastic tube.

9. The hinge structure as claimed in claim **8**, comprising another cable, wherein the elastic tube has as third opening, and the another cable penetrates through the first through hole and passes through the first opening and the third opening.

10. An electronic device, comprising:

a host and a display; and

a hinge structure, comprising:

a pivot bracket;

a first shaft, pivoted to the pivot bracket and having a first through hole, wherein the first shaft is connected to the host;

a second shaft, pivoted to the pivot bracket and having a second through hole, wherein the second shaft is connected to the display; and

a cable, comprising a first penetrating segment, a second penetrating segment, and a curved segment, wherein the first penetrating segment penetrates through the first through hole, the second penetrating segment penetrates through the second through hole, and two ends of the curved segment are respectively connected to the first penetrating segment and the second penetrating segment.

11. The electronic device as claimed in claim **10**, wherein the first shaft is pivoted to the pivot bracket along a first axis, the second shaft is pivoted to the pivot bracket along a second axis, and the first axis is parallel to the second axis.

12. The electronic device as claimed in claim **11**, wherein the first through hole extends along the first axis, and the second through hole extends along the second axis.

13. The electronic device as claimed in claim **10**, wherein the hinge structure comprises a first holder and a second holder, the first holder is connected to the first shaft, the first shaft is connected to the host through the first holder, the second holder is connected to the second shaft, and the second shaft is connected to the display through the second holder.

14. The electronic device as claimed in claim **13**, wherein the pivot bracket is located between the first holder and the curved segment and is located between the second holder and the curved segment.

15. The electronic device as claimed in claim **13**, wherein the first shaft has a first groove, the second shaft has a second groove, the first groove is located between the first holder and the first through hole, the second groove is located between the second holder and the second through hole, the first penetrating segment extends to the first groove and curves in the first groove to extend to an outside of the first shaft, and the second penetrating segment extends to the second groove and curves in the second groove to extend to an outside of the second shaft.

16. The electronic device as claimed in claim **15**, wherein the first groove has a first arc-shaped surface inside, and the second groove has a second arc-shaped surface inside.

17. The electronic device as claimed in claim **10**, wherein the hinge structure comprises an elastic tube, the elastic tube has a first opening and a second opening opposite to each other, the first opening and the second opening are respectively connected to the first through hole and the second through hole, and the curved segment is located in the elastic tube.

18. The electronic device as claimed in claim **17**, wherein the hinge structure comprises another cable, the elastic tube has a third opening, and the another cable penetrates through the first through hole and passes through the first opening and the third opening.

19. An assembling method of a hinge structure, comprising:

pivoting a first shaft to a pivot bracket;

pivoting a second shaft to the pivot bracket;

providing a cable to penetrate through a first through hole of the first shaft;

curving the cable penetrating out through the first through hole; and

providing the curved cable to penetrate through a second through hole of the second shaft.

20. The assembling method of the hinge structure as claimed in claim **19**, comprising:

connecting two ends of an elastic tube to the first through hole and the second through hole respectively;

providing the cable penetrating out through the first through hole to penetrate through the elastic tube to reach the second through hole.

* * * * *