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(54) Title: PROTECTIVE CASE FOR PORTABLE ELECTRONIC DEVICES

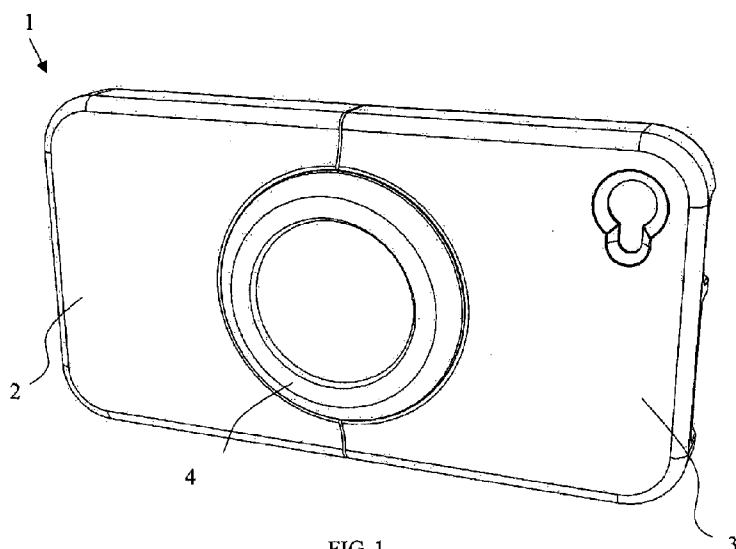


FIG. 1

(57) Abstract: A protective case (1) for portable electronic devices is provided, which comprises a first portion (2) provided with a cavity for receiving part of an electronic device while exposing a screen of the latter; a second portion (3) opposite against the first portion (2), which is provided with a cavity for receiving a remaining part of the electronic device while exposing the screen of the latter; and a fastener (4) between the first and second portions for detachably attaching the first portion to the second portion.

## PROTECTIVE CASE FOR PORTABLE ELECTRONIC DEVICES

FIELD OF THE INVENTION

5           The present invention generally relates to a protective case for portable electronic devices.

BACKGROUND OF THE INVENTION

10           Due to convenience, more and more people are fond of portable electronic devices, such as mobile phone, personal digital assistant, PSP (playstation portable), digital media player, portable computers, etc. To make these electronic devices more accessible and portable for the user, the devices should be capable of being carried in an instant access position i.e. around the neck or over shoulder like a camera. Therefore, the housing of such devices should provide a secure way of a strap attachment and also protection from physical abuse or risk of damage.

15           Although protective cases are available in the market, none of which provide a strong strap attachment system and a secure lock system which holds the assembled case together.

          Therefore, it is desirable to have a protective case which provide a secure around the neck or over the shoulder carry position, and a secure yet convenient way of attaching and detaching the case from these electronic devices.

20

SUMMARY OF THE INVENTION

25           The present invention mainly aims to provide a protective case with a secure locking system and a strap attachment system enabling it to be carried in a hanging manner similar to a camera.

30           The protective case for portable electronic devices of the present invention may comprise a first portion provided with a cavity for receiving part of an electronic device while exposing a screen of the latter; a second portion opposite against the first portion, which is provided with a cavity for receiving a remaining part of the electronic device while exposing the screen of the latter; and a fastener provided between the first and second portions for detachably attaching the first portion to the second portion.

          The fastener may be a ring or cap for detachably attaching the first portions to the second

portions; and an annular groove formed on an outer surface of the first and second portions along contacting edges thereof for receiving the ring or cap; in which a thread screw is formed on a side wall of the annular groove with a smaller diameter, and a matching thread screw is formed on an inner side wall of the ring or cap.

5 Or, the fastener may be a ring or cap for detachably attaching the first portions to the second portions; and an annular groove formed on an outer surface of the first and second portions along contacting edges thereof for receiving the ring or cap; in which at least a locking tab is formed at an upper part of a side wall of the annular groove with a smaller diameter, and at least a trough is formed in an inner side wall of the ring or cap and a receiving notch is  
10 formed at end of each trough, in which each receiving notch is used to receive a corresponding locking tab when the ring or cap is placed into the annular groove, and then the locking tab is trapped in the corresponding trough with the rotation of the ring or cap.

The fasteners could also be other well-known fasteners formed between the first and second portion of the protective case.

15 Furthermore, at least a through hole is provided with the first portion and/or the second portion, and an anchor is provided for each of the at least a through hole, in which each anchor comprises a base, a strut extending upwards from the center of the base, and a hole formed at tip of the strut for anchoring a strap, in which the size of the base is slightly larger than that of the through hole, while the size of the strut is slightly smaller than that of the through hole to  
20 enable to be inserted through the latter.

Or, at least a through hole is provided with the first portion and/or the second portion, a transverse spacer is formed in the middle of each of the at least a through hole, and a strap is attached to the protective case around the transverse spacer.

## 25 BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be described in detail with reference to the accompanying drawings, in which,

Fig. 1 is a front perspective view of a protective case for portable electronic devices  
30 according to a first embodiment of the present invention;

Fig. 2 is another front perspective view of the first embodiment with a ring thereof detached;

Fig. 3 is an exploded perspective view of the first embodiment viewed from a rear side, illustrating how to cover an electronic device with the first embodiment;

Fig. 4 is an exploded perspective view of the first embodiment viewed from a front side;

Fig. 5 is a rear perspective view of a protective case for portable electronic devices according to a second embodiment of the present invention;

Fig. 6 is a schematic view illustrating how to use the second embodiment;

Fig. 7 is another schematic view illustrating how to use the second embodiment;

Fig. 8 is a front perspective view of a protective case for portable electronic devices according to a third embodiment of the present invention;

Fig. 9 is a schematic view illustrating how to use the third embodiment;

Fig. 10 is a front perspective view of a protective case for portable electronic devices according to a fourth embodiment of the present invention with a ring thereof detached;

Fig. 11 is a rear perspective view of a ring of the fourth embodiment;

Fig. 12 is a front perspective view of a protective case for portable electronic devices according to a fifth embodiment of the present invention with a ring thereof detached;

Fig. 13 is an exploded perspective view of the fifth embodiment viewed from a front side;

Fig. 14 is a rear perspective view of the ring of the fifth embodiment; and

Fig. 15 is a front perspective view of a protective case for portable electronic devices according to a sixth embodiment of the present invention with a cap thereof detached.

## DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the preferred embodiments of the invention, which is illustrated in the accompanying figures. The aspects, features and advantages of the present invention will be better understood by those skilled in the art from the detailed description of the embodiments of the invention in conjunction with the accompanying drawings. Exemplary embodiments of the present application and the description thereof are for illustration purpose only, and should not be construed as limitation to the protective scope of the present invention.

As shown in Figs. 1 and 2, the protective case 1 of the present invention may comprise a first portion 2, a second portion 3 opposite against the former and a ring 4 for attaching the first portion 2 to the second portion 3.

With reference to Fig. 3, the first portion 2 is provided with a cavity 21 for receiving part of an electronic device 6, such as a mobile phone, while exposing a screen of the latter. Similarly, the second portion 3 is also provided with a cavity 31 for receiving the remaining of the electronic device 6 while exposing the screen of the latter.

5 To enable the first and second portions 2 and 3 to adjoin each other tightly, a lip 32 could be extended outwards from an edge of the second portion 3 facing to the first portion 2, while a flute 22 could be formed into an edge of the first portion 2 facing to the second portion 3. The flute 22 is used for receiving the lip 32 when the first and second portions contact each other.

Particularly shown in Fig. 2, an annular groove 5 is formed on an outer surface of the first and second portions 2 and 3 along contacting edges of the latters, for receiving the ring 4. 10 Therefore, a segment of the annular groove 5 is formed on the first portion 2, while the remaining of the annular groove 5 is formed on the second portion 3. A screw thread 51 is formed on a side wall of annular groove 5 with a smaller diameter, and a matching screw thread 41 is formed on an inner side wall of the ring 4 to engage with the screw thread 51.

15 Within the annular groove 5, a flap 23 could be extended from the edge of the first portion 2 facing to the second portion 3, while a matching recess 33 could be formed on the second portion 3 for receiving the flap 23 when the first and second portions 2 and 3 contact each other.

As shown in Figs. 2 and 4, the protective case 1 could be provided with a plurality of 20 openings 24 and 34 on the first and second portions 2 and 3 respectively, for external access to ports, buttons and switches of the electronic device 6, for instance, docking port, charging port, headphone jack, on/off switch, opening for lens, etc.

The assembly of the protective case of the present invention is as follows. Firstly, the two portions 2 and 3 of the protective case are sleeved onto the electronic device 6, to receive the 25 electronic device 6 while expose the screen of the latter. Next, the two portions 2 and 3 are moved towards each other to contact each other. Then, the ring 4 is placed into the annular groove 5. Finally, the ring 4 is rotated to enable the screw threads 41 and 51 engage with each other. Therefore, the protective case 1 is attached tightly onto the electronic device 6.

Figs. 5-7 illustrate a second embodiment 10 of the protective case of the present invention. 30 The second embodiment 10 is similar to the first embodiment 1 except that, in the second embodiment 10 at least a through hole 14 is provided with the first portion 12 and/or the second portion 13. The second embodiment 10 may be further provided with an anchor 15 for

each of the at least a through hole 14. The anchor 15 comprises a base 151, a strut 152 extending upwards from the center of the base 151, and a hole 153 formed at tip of the strut 152. The size of the base 151 is slightly larger than that of the through hole 14, while the size of the strut 152 is slightly smaller than that of the through hole 14 to enable to be inserted through the latter. Before the second embodiment 10 is sleeved onto the electronic device, the strut 152 of the anchor 15 is inserted into the through hole 14 from the side of the cavities of the first and second portions. Then, a strap 16 could be attached to the hole 153 of the anchor 15 to enable the protective case of the present invention together with the electronic device to be hanged around the neck of a user.

Figs. 6 and 7 illustrate that two through holes 14 are provided on the first and second portions 12 and 13 respectively, and two anchors 15 are mounted at the two through holes respectively. Then, the strap 16 could hang the protective case in different orientations.

Figs. 8 and 9 illustrate a third embodiment 10' of the protective case of the present invention. The third embodiment 10' is similar to the first embodiment 1 except that, in the third embodiment 10' at least a through hole 14' is provided with the first portion 12' and/or the second portion 13'. Within each through hole 14', a transverse spacer 15' is formed in the middle of the through hole. As shown in Fig. 9, a strap 16' could be attached to the protective case around the transverse spacer 15' within the through hole 14', to enable the protective case of the present invention together with the electronic device to be hanged around the neck of a user.

Figs. 10 and 11 illustrate a fourth embodiment 100 of the protective case of the present invention. The fourth embodiment 100 is similar to the first and second embodiments 1 and 10, except that in the fourth embodiment 100, at least a locking tab 1051 is formed at an upper part of a side wall of an annular groove 105 with a smaller diameter. Correspondingly, at least a trough 1041 is formed in an inner side wall of a ring 104 of the fourth embodiment, and a receiving notch 1042 is formed at end of each trough 1041 for receiving the locking tab 1051. When the ring 104 is placed into the annular groove 105, the locking tab 1051 is received into the receiving notch 1042 firstly, and then trapped in the trough 1041 with the rotation of the ring 104. Thus, the two portions 102 and 103 of the fourth embodiment could be fastened tightly with the ring 104.

Figs. 12-14 illustrate a fifth embodiment 200 of the protective case of the present invention. The fifth embodiment 200 is similar to the fourth embodiment 100 except for the

following differences.

In the fifth embodiment 200, a bulge 2024 is extended from a periphery of a flap 2023 of a first portion 202 towards a recess 2033 of the second portion 203, while a matching cut 2034 is formed on an edge of the recess 2033 for receiving the bulge 2024. The depth of the cut 2034 is formed in such a manner that the bulge 2024 could be slightly moved up and down along the depth of the cut by releasing or pressing down the flap 2023.

Correspondingly, an indentation 2043 is formed in an inner side wall of the ring 204 for receiving the bulge 2024. After the ring 204 is disposed into an annular groove 205, the bulge 2024 would spring into the indentation 2043 with the rotation of the ring 204. Then, the rotation of the ring 204 could be prevented by the engagement of the bulge 2024 and the indentation 2043.

To release the ring 204, a user only needs to press down the flap 2023. Thus, the bulge 2024 would be moved downwards along the depth of the cut 2034, and then disengage from the indentation 2043. Thereby, the ring 204 could be rotated to be detached from the first and second portions 202 and 203.

Fig. 15 illustrates a sixth embodiment 300 of protective case of the present invention. The sixth embodiment 300 is similar to the fifth embodiment 200 except that the ring in the sixth embodiment 300 is replaced by a cap 304. Similarly, the ring in the other embodiments could be replaced by a cap.

As mentioned above, the two portions of the protective case could be fastened by the ring or cap by means of thread screws or combination of locking tab and trough. However, other kinds of fasteners could also be applied between the first and second portions of the present protective case, such as Velcros, magnets, etc., which are well known in the art and would be not described in details herein.

Although the description of the present invention is made with reference to the preferred embodiments, the present invention is not limited to these embodiments. Various modifications and changes can be made to the invention by those skilled in the art without departing from the spirit and scopes of the present invention.

## CLAIMS

What is claimed is

1. A protective case for portable electronic devices comprising:
  - 5 a first portion provided with a cavity for receiving part of an electronic device while exposing a screen of the latter;
  - a second portion opposite against the first portion, which is provided with a cavity for receiving a remaining part of the electronic device while exposing the screen of the latter;
  - a fastener provided between the first and second portions for detachably attaching the
  - 10 first portion to the second portion.
2. The protective case according to claim 1, wherein the fastener comprises:
  - a ring or cap for detachably attaching the first portion to the second portion; and
  - an annular groove formed on an outer surface of the first and second portions along
  - contacting edges thereof for receiving the ring or cap;
  - 15 wherein a thread screw is formed on a side wall of the annular groove with a smaller diameter, and a matching thread screw is formed on an inner side wall of the ring or cap.
3. The protective case according claim 2, wherein a flap is extended from an edge of the first portion facing to the second portion within the annular groove, and a matching recess is formed on the second portion within the annular groove for receiving the flap
- 20 when the first portion is attached to the second portion.
4. The protective case according to claim 1, wherein the fastener comprises:
  - a ring or cap for detachably attaching the first portions to the second portions; and
  - an annular groove formed on an outer surface of the first and second portions along
  - contacting edges thereof for receiving the ring or cap;
  - 25 wherein at least a locking tab is formed at an upper part of a side wall of the annular groove with a smaller diameter, and at least a trough is formed in an inner side wall of the ring or cap and a receiving notch is formed at end of each trough, in which each receiving notch is used to receive a corresponding locking tab when the ring or cap is placed into the annular groove, and then the locking tab is trapped in the corresponding trough with the
  - 30 rotation of the ring or cap.
5. The protective case according claim 4, wherein a flap is extended from an edge of

the first portion facing to the second portion within the annular groove, and a matching recess is formed on the second portion within the annular groove for receiving the flap when the first portion is attached to the second portion.

5         6. The protective case according to claim 5, wherein a bulge is extended from a periphery of the flap towards the recess, and a matching cut is formed on an edge of the recess for receiving the bulge, in which the depth of the cut is formed in such a manner that the bulge could be slightly moved up and down along the depth of the cut by releasing or pressing down the flap; and an indentation is formed in the inner side wall of the ring or cap for receiving the bulge.

10         7. The protective case according to claim 1, wherein a lip is extended outwards from an edge of the second portion facing to the first portion, and a flute is formed into an edge of the first portion facing to the second portion for receiving the lip when the first portion is attached to the second portions.

15         8. The protective case according to claim 1, wherein the protective case is provided with a plurality of openings for external access to ports, buttons and switches of the electronic device.

20         9. The protective case according to any one of claims 1 to 8, wherein at least a through hole is provided with the first portion and/or the second portion, and an anchor is provided for each of the at least a through hole, in which each anchor comprises a base, a strut extending upwards from the center of the base, and a hole formed at tip of the strut for anchoring a strap, in which the size of the base is slightly larger than that of the through hole, while the size of the strut is slightly smaller than that of the through hole to enable to be inserted through the latter.

25         10. The protective case according to the claim 9, wherein two through holes are provided at two corners of the protective case respectively each of which is provided with one anchor, and the strap is anchored to the two anchors to be able to hang the protective case in different orientations.

30         11. The protective case according to any one of claims 1 to 8, wherein at least a through hole is provided with the first portion and/or the second portion, a transverse spacer is formed in the middle of each of the at least a through hole, and a strap is attached to the protective case around the transverse spacer.

12. The protective case according to the claim 11, wherein two through holes are provided at two corners of the protective case respectively, and the strap is anchored to the transverse spacers within the through holes to be able to hang the protective case in different orientations.

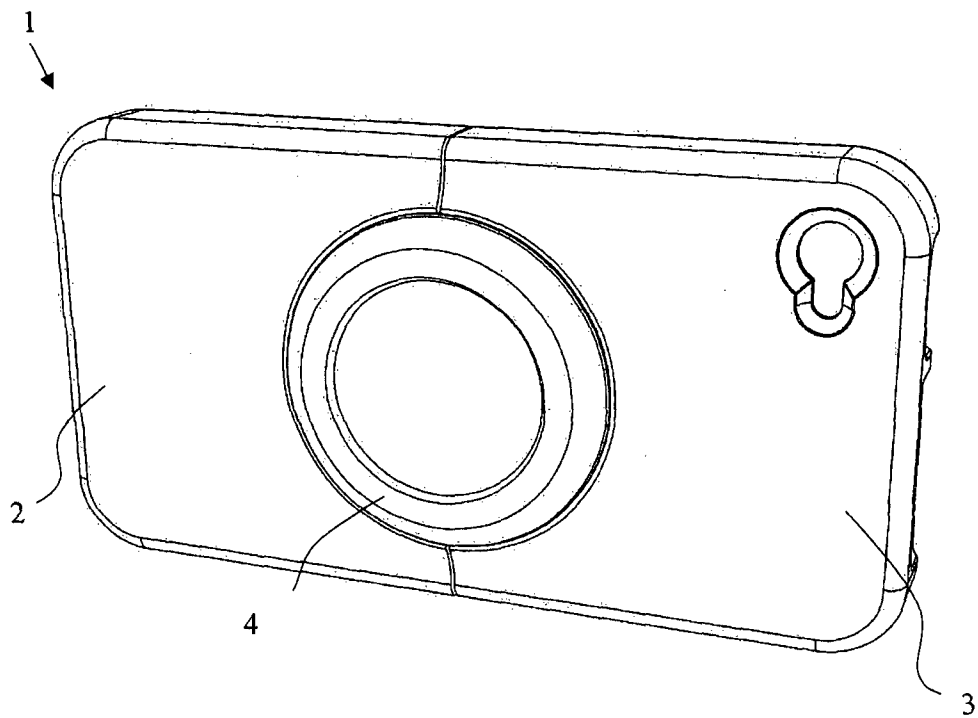


FIG. 1

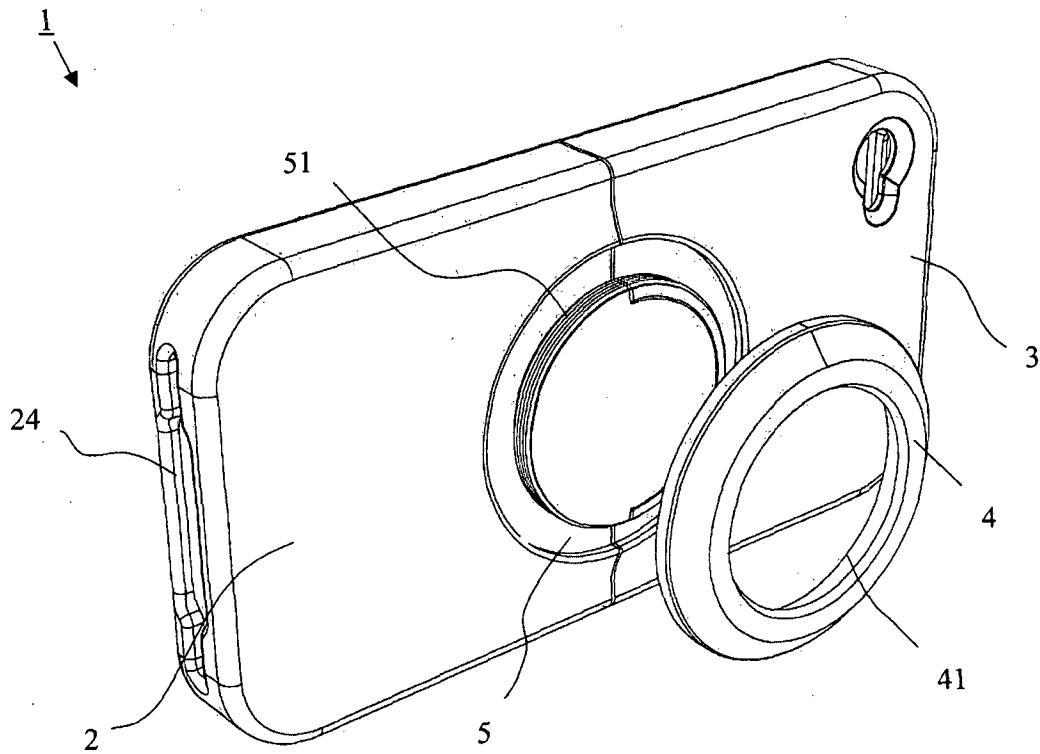


FIG. 2

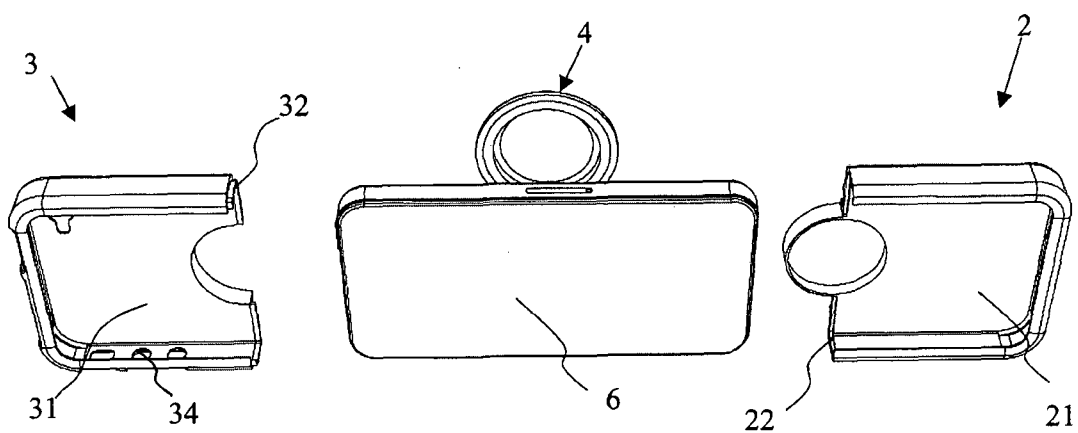


FIG. 3

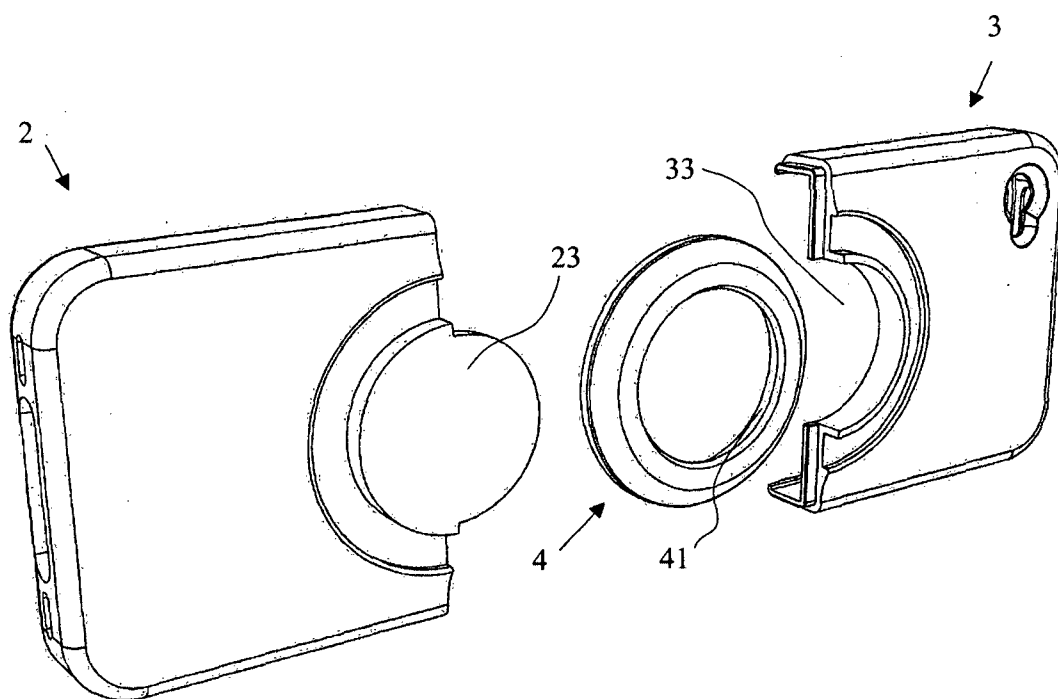


FIG. 4

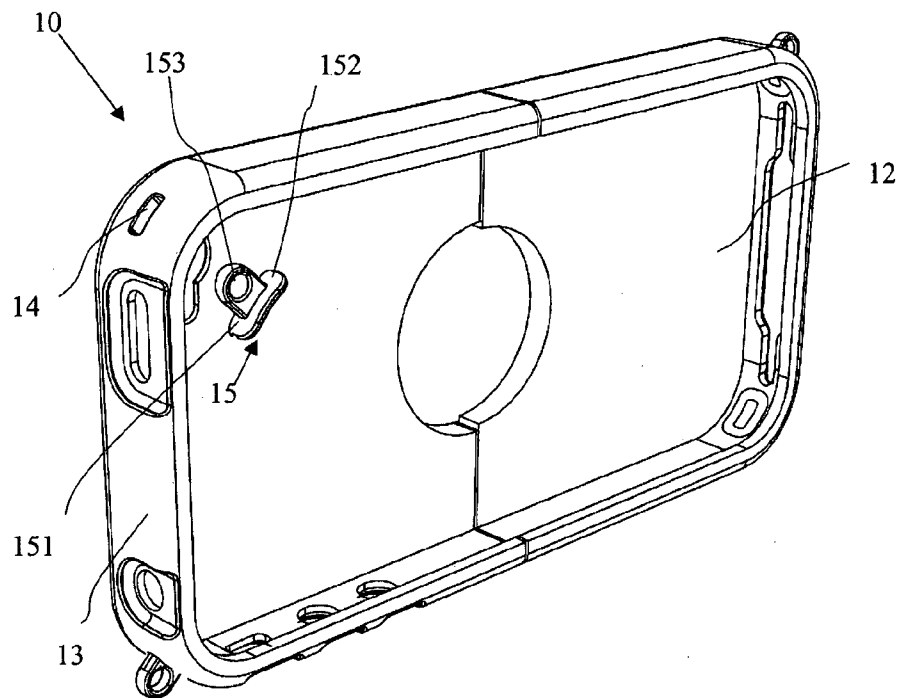


FIG. 5

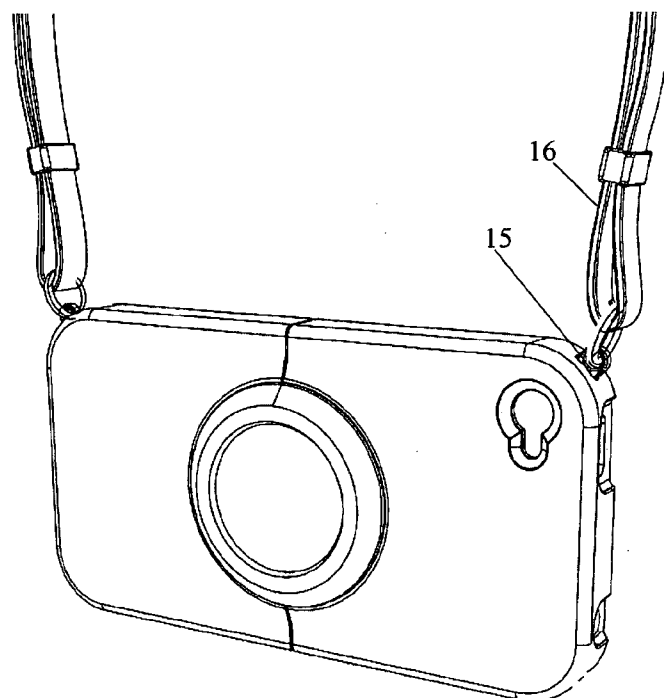


FIG. 6

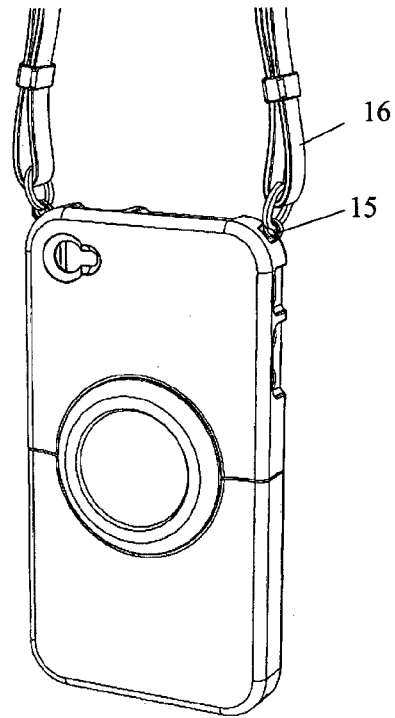


FIG. 7

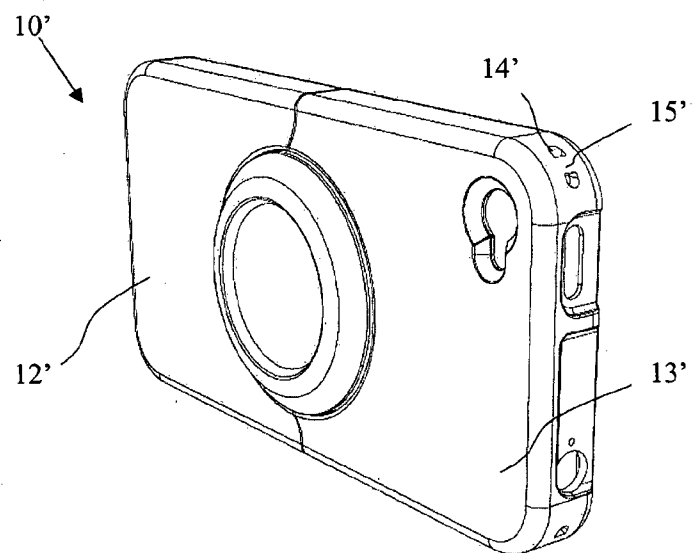


FIG. 8

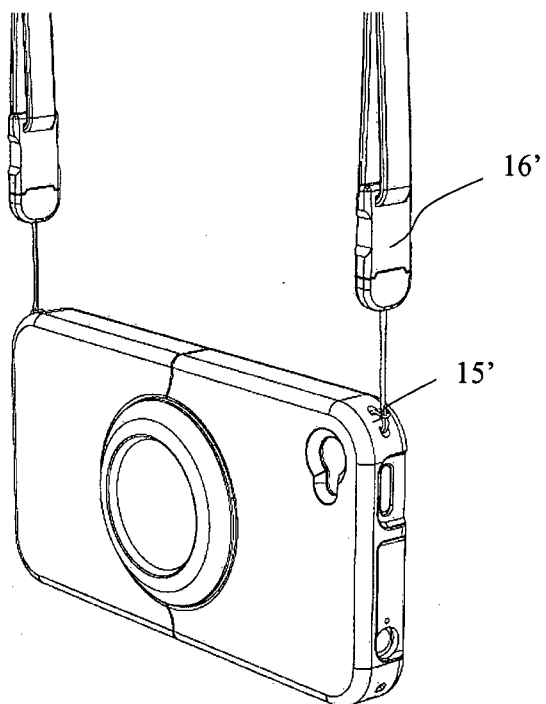


FIG. 9

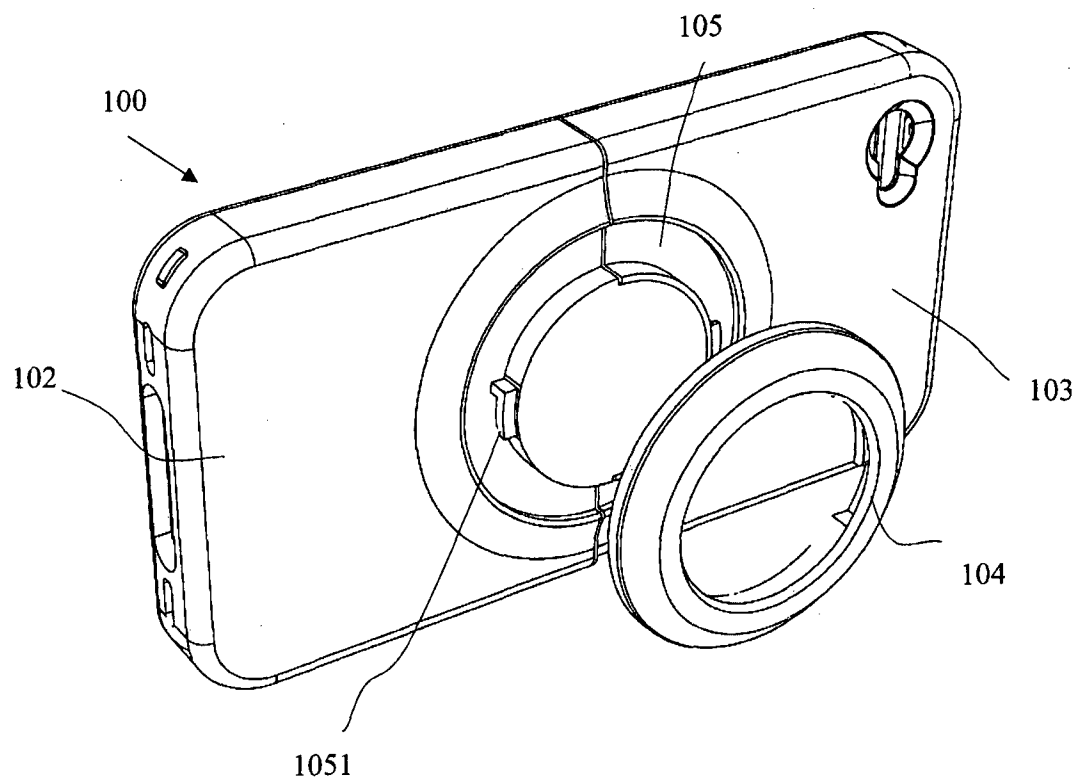


FIG. 10

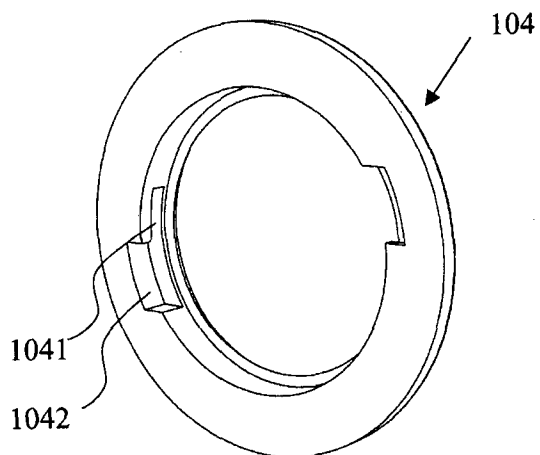


FIG. 11

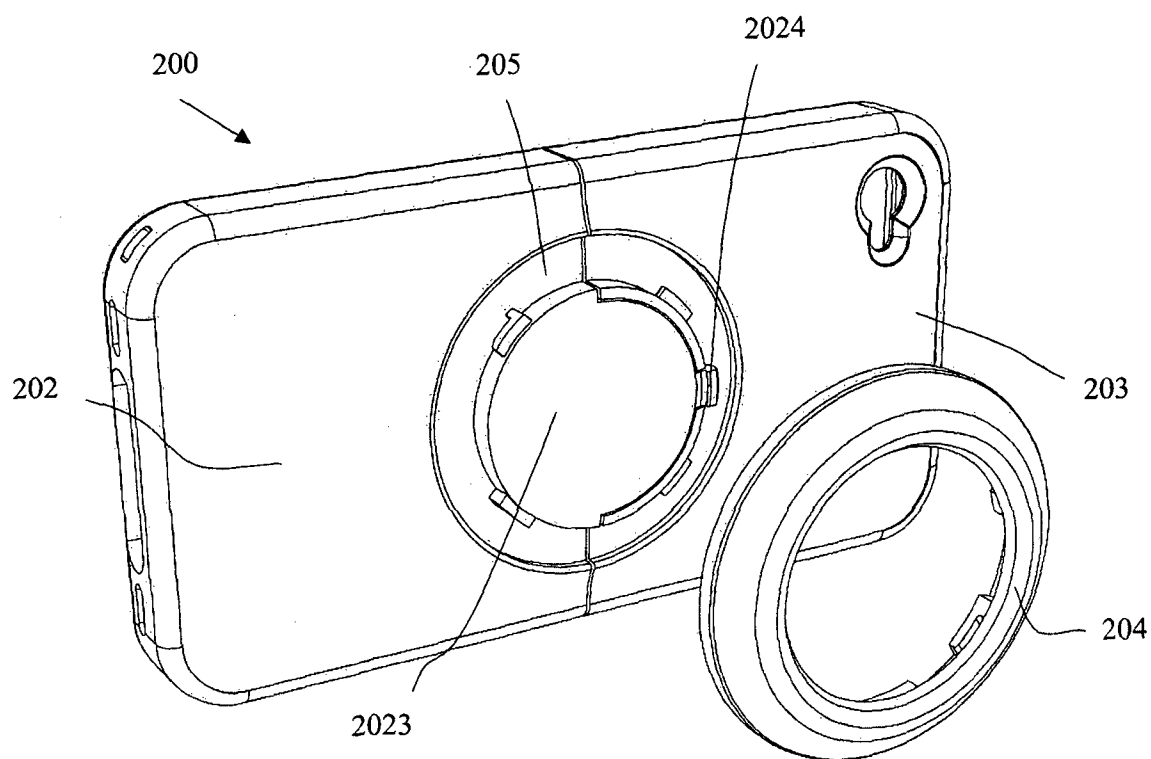


FIG. 12

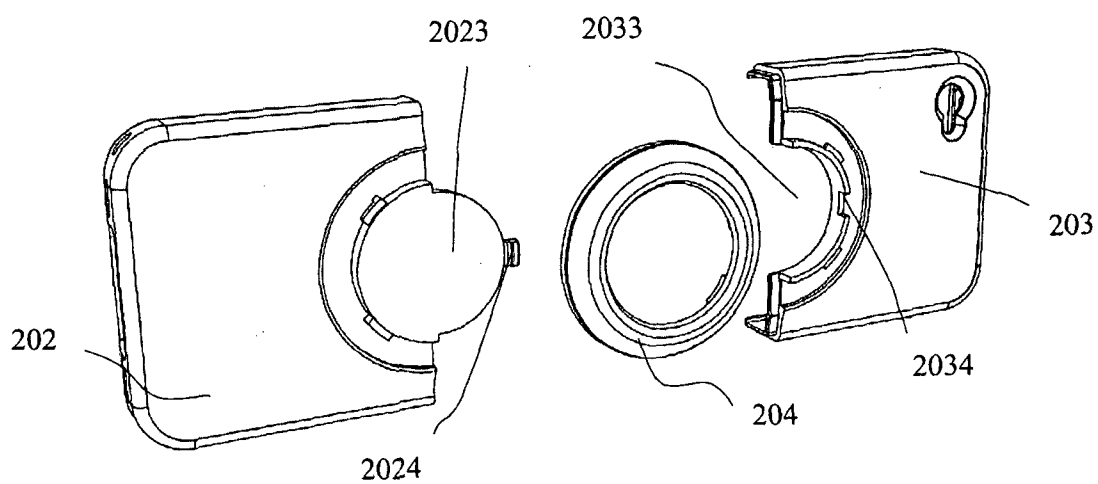


FIG. 13

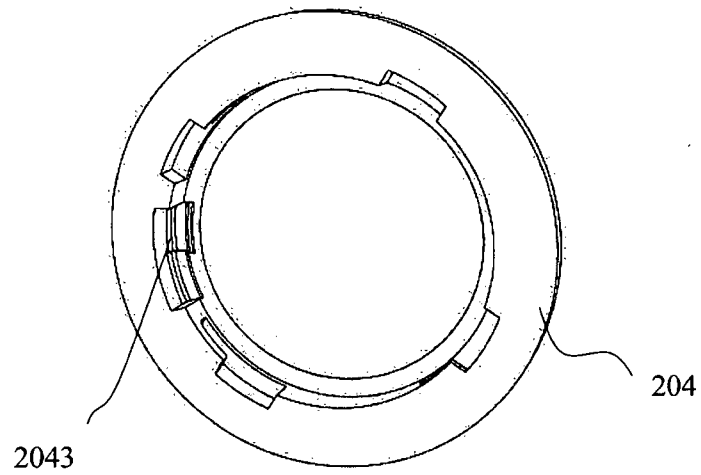


FIG. 14

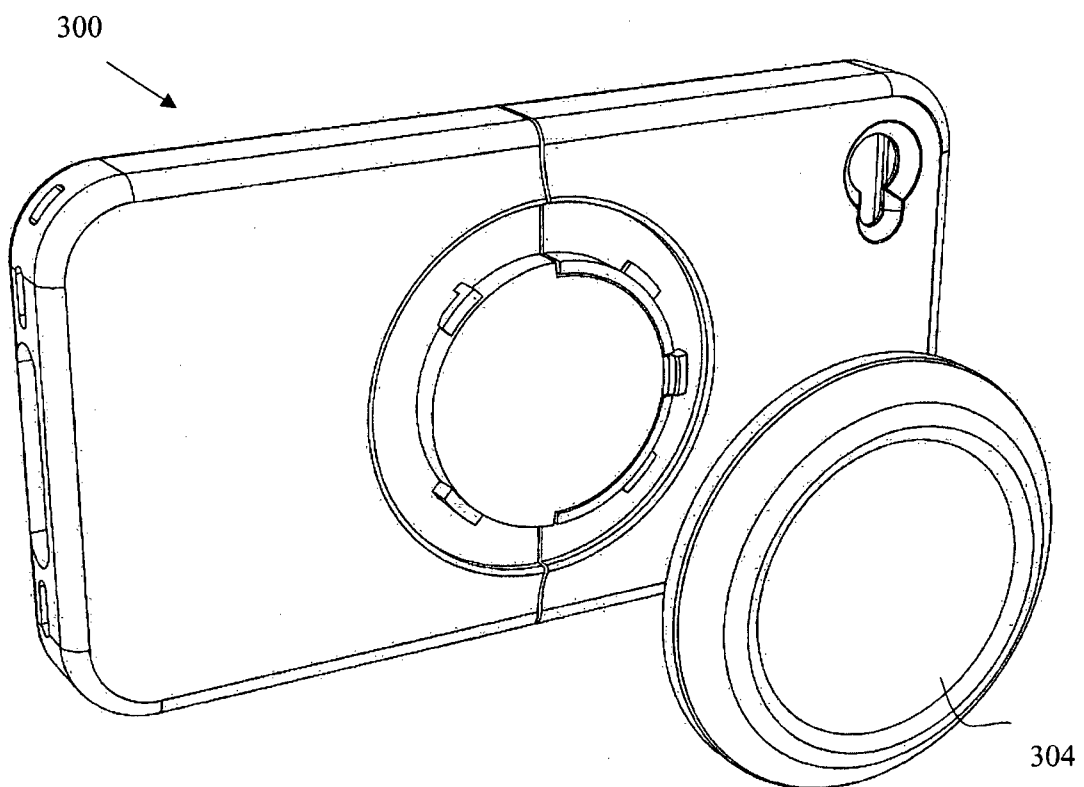


FIG. 15

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/CN2011/071484

**A. CLASSIFICATION OF SUBJECT MATTER**

H04M 1/02 (2006.01) i

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

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC:H04M,H01M,H05K

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

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

EPODOC,WPI,CNPAT,CNKI: case, housing, lock+, fastener, ring, cap, hole, groove, spacer

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                           | Relevant to claim No. |
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| Y         | CN201085150Y (FRUIT SHOP CREATIVE MARKETING) 16 July 2008(16.07.2008)fig. 1                                                                  | 11,12                 |
| A         | CN101426039A (HONGFUJIN PRECISION INDUSTRY SHENZHEN CO.LTD.)<br>05 May 2009 (06.05.2009) the whole document                                  | 1-12                  |

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

|                                                                                                                                                                          |                                                                                                                                                                                                                                                  |
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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Date of the actual completion of the international search<br>10 Nov.2011(10.11.2011)                                                                                                                         | Date of mailing of the international search report<br><b>08 Dec. 2011 (08.12.2011)</b> |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China<br>100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br><b>WEI,Wei</b><br>Telephone No. (86-10)62414280                  |

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2011/071484

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages       | Relevant to claim No. |
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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
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| Patent Documents referred<br>in the Report | Publication Date | Patent Family   | Publication Date |
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