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(54) **REAGENT BOTTLE SHADING DEVICE AND ANALYSIS DEVICE**

(57) The present utility model relates to a reagent bottle shading device, comprising: a tray and a sidewall connected to the tray; wherein a base hole is provided on the tray; a top end of the sidewall forms a top end

opening, to allow the convenient insertion and withdrawal of a reagent bottle; wherein a base hole is provided on the tray, the size of the base hole being adapted for the entry of a finger.

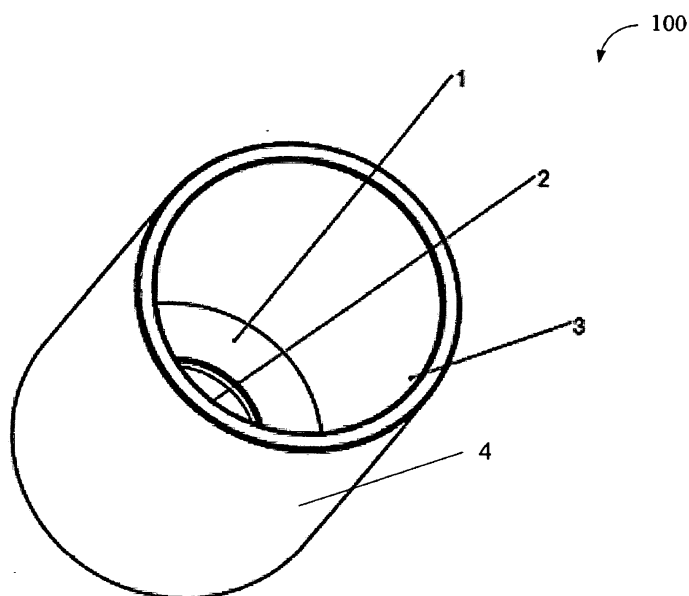


Fig. 1

Description

Technical field

[0001] The present utility model relates to a shielding device, in particular to a reagent bottle shading device.

Background art

[0002] Clinical laboratories and biological laboratories often need to use analysis devices to test batch samples. For example, a Western blot analyser is an analysis device used for subjecting a provided tissue homogenate or tissue extract sample to specific protein detection, and the most commonly used device for testing protein characteristics, expression and distribution.

[0003] When an analysis device is used for detection, it is often necessary to add different reagents to a sample. However, some reagents need shading treatment. For example, reagent bottles holding substrate reagent for colorization, which are widely used in scientific research and diagnostic laboratories, need to be shaded when stored.

[0004] Reagent bottle shading devices in the prior art are fixed. Therefore the operator needs to remove the shading device in order to manipulate the reagent bottle. This makes manipulation extremely inconvenient. Moreover, this method makes it difficult to observe the state of reagent in the reagent bottle. Most of the time, the operator is forced to employ the simpler method of enclosing the reagent bottle in tin foil to shade it. Not only does this cause wastage, but sometimes the shading effect cannot be guaranteed.

Content of the utility model

[0005] In response to the above technical problem, the present application proposes a reagent bottle shading device, comprising: a tray and a sidewall connected to the tray;

[0006] wherein a top end of the sidewall forms a top end opening, to allow the insertion and withdrawal of a reagent bottle; wherein a base hole is provided on the tray, the size of the base hole being adapted for the entry of a finger.

[0007] The reagent bottle shading device as described above, wherein the sidewall covers at least 1/5 of the height of the reagent bottle below a bottle cap, or at least 1/2 of the height, or at least 4/5 of the height; or the sidewall completely covers the height of the reagent bottle below the bottle cap; or the sidewall completely covers the entire reagent bottle.

[0008] The reagent bottle shading device as described above, wherein the shape of the sidewall is the same as the shape of a corresponding reagent bottle.

[0009] The reagent bottle shading device as described above, wherein the tray and the sidewall are formed as a single piece.

[0010] The reagent bottle shading device as described above, wherein a slit is provided on the sidewall.

[0011] The reagent bottle shading device as described above, further comprising a weight sensor adapted for detecting the weight of a reagent bottle.

[0012] The reagent bottle shading device as described above, wherein the weight sensor communicates with an analysis device in a wired or wireless manner.

[0013] The reagent bottle shading device as described above, further comprising a display device in communication with the weight sensor.

[0014] The reagent bottle shading device as described above, further comprising an openable top cover.

[0015] According to another aspect of the present application, an analysis device is proposed, comprising: a reagent bottle shading device, comprising a tray and a sidewall connected to the tray; wherein a top end of the sidewall forms a top end opening, to allow the insertion and withdrawal of a reagent bottle; and further comprising a weight sensor adapted for detecting the weight of the reagent bottle; a reagent addition means adapted for adding reagent to the reagent bottle; and a control means adapted for controlling the reagent addition means according to the weight of the reagent bottle detected by the weight sensor.

[0016] The shading device of the present utility model solves technical problems such as the insertion and withdrawal of a reagent bottle and facilitating observation of the amount of liquid in the reagent bottle. Furthermore, it is possible to take away the device and reagent bottle at the same time in a portable manner, to satisfy the requirement of adding reagent at any time. The present utility model can block light rays rigorously, and therefore has a good shading effect.

Description of the accompanying drawings

[0017] Preferred embodiments of the present utility model are explained below in further detail in conjunction with the accompanying drawings, wherein:

Fig. 1 is a schematic diagram of a shading device according to an embodiment of the present utility model;

Fig. 2 is a sectional schematic diagram of a shading device according to an embodiment of the present utility model;

Fig. 3 is a schematic diagram of a reagent bottle inserted in a shading device according to an embodiment of the present utility model; and

Fig. 4 is a schematic diagram of a shading device according to another embodiment of the present utility model.

Particular embodiments

[0018] To clarify the object, technical solution and advantages of embodiments of the present utility model, the technical solution of embodiments of the present utility model will be described clearly and fully below in conjunction with the drawings of embodiments of the present utility model. Obviously, the embodiments described are some, not all, of the embodiments of the present utility model. All other embodiments obtained by those skilled in the art based on embodiments of the present utility model without expending any inventive effort shall be included in the scope of protection of the present utility model.

[0019] The "reagents" referred to herein as needing to be shaded include: all liquids which might be used in an analysis device and which might interact with light, including but not limited to substrate reagents for colorization, active reagents which need to be stored away from light, and optically unstable reagents which might react chemically with light, etc.

[0020] The object of the present utility model is to propose a shading device which can facilitate insertion and withdrawal of a reagent bottle of a reagent which needs to be shaded, and also facilitate observation of the amount of liquid in the reagent bottle. Fig. 1 is a schematic diagram of a shading device according to an embodiment of the present utility model. As the figure shows, the shading device is a reagent bottle shading cover 100, comprising: a tray 1, a base hole 2, a top end opening 3 and a sidewall 4. The reagent bottle shading cover has a similar shape to the reagent bottle, and is provided with the tray 1 at the bottom, with the base hole 2 being provided on the tray 1. There is an opening at an upper part of the reagent bottle shading cover, to enable a reagent bottle to be inserted and withdrawn conveniently. According to an embodiment of the present utility model, the sidewall of the reagent bottle shading cover covers at least 1/5 of the height below a reagent bottle cap, or at least 1/2 of the height, or at least 4/5 of the height, or completely covers the height of the reagent bottle below the bottle cap, or completely covers the entire reagent bottle.

[0021] Fig. 3 is a sectional schematic diagram of a shading device according to an embodiment of the present utility model. According to an embodiment of the present utility model, the tray and sidewall of the shading device may be formed as a single piece. Fig. 3 is a schematic diagram of a reagent bottle inserted in a shading device according to an embodiment of the present utility model. As Fig. 3 shows, the shading device 301 has received almost the entire reagent bottle 302, with only part of the bottle cap being exposed. Since the bottle cap of the reagent bottle 302 does itself also have a shading effect, the two together can produce a very good shading effect. As shown in the drawing, the bottle cap of the reagent bottle 302 is provided with an aperture 303 which facilitates the insertion of a liquid addition pipeline. When reagent is added or the reagent bottle is changed, the

liquid addition pipeline simply needs to be removed from the aperture 303, and the operation can then be performed.

[0022] As Figs. 1, 2 and 3 show, when a reagent bottle is to be inserted in the shading cover, the reagent bottle can simply be inserted in the shading cover through the top end opening of the shading cover. When it is necessary to withdraw the reagent bottle from the shading cover, the user can push his finger through the base hole to push out the reagent bottle, and then conveniently withdraw the reagent bottle from the upper part of the shading cover.

[0023] The shading device of the present utility model is simple in structure, and it is possible to take away the shading device and reagent bottle at the same time in a portable manner, to satisfy the requirement of adding reagent at any time. Moreover, since light rays can be blocked rigorously, the shading effect is very good. With the present utility model, the reagent bottle can be inserted in and withdrawn from the shading device conveniently, and this facilitates observation of the amount of liquid reagent in the reagent bottle. In some situations, the shading device and reagent bottle are removed from the analysis device, without withdrawing the reagent bottle, and the amount of liquid in the reagent bottle can then be estimated according to the weight of the shading device and reagent bottle. This is another advantage of the present utility model.

[0024] According to an embodiment of the present utility model, a slit of very small width is provided on the sidewall of the shading device 100. The amount of liquid in the reagent bottle can also be conveniently observed through this slit. During actual operations, the slit in the shading device 100 is arranged so as to face a light-free side of the interior of the analysis device. Since the slit itself is of very small width and faces a light-free side, the presence of the slit will not have any impact on the shading effect.

[0025] According to an embodiment of the present utility model, the shading device comprises a weight sensor. The weight sensor can reflect the amount of reagent in the reagent bottle based on the weight or change in weight of the reagent bottle. Furthermore, the shading device can communicate with a control means of an analysis device, and send an amount of reagent in the reagent bottle to the analysis device. The analysis device can display the amount of reagent on a display screen thereof, to facilitate monitoring of the amount of reagent. Furthermore, a means for automatically adding reagent is installed on the reagent bottle, so that automatic addition of reagent to the reagent bottle can be achieved using the amount of reagent in the reagent bottle as detected by the shading device. Moreover, since the means for detecting the amount of reagent in the reagent bottle is installed in the reagent bottle shading device, it can suit different reagent bottles or automatic reagent addition means.

[0026] According to an embodiment of the present util-

ity model, an analysis device comprises: a reagent bottle shading device, a reagent addition means and a control means. The reagent bottle shading device comprises a tray and a sidewall connected to the tray; wherein a top end of the sidewall forms a top end opening, to allow the insertion and withdrawal of a reagent bottle. The reagent bottle shading device further comprises a weight sensor adapted for detecting the weight of the reagent bottle. The reagent addition means is adapted for adding reagent to the reagent bottle. The control means is adapted for controlling the reagent addition means to add reagent to the reagent bottle according to the weight of the reagent bottle detected by the weight sensor, thereby achieving automatic addition of reagent.

[0027] Fig. 4 is a schematic diagram of a shading device according to another embodiment of the present utility model. As Fig. 4 shows, the shading device 400 comprises a tray 1, a base hole 2, a top end opening 3, and a sidewall 4. As Fig. 4 shows, unlike the shading device in the embodiment of Fig. 1 which is cylindrical, the shading device in Fig. 4 is a cuboid. Thus, the shape of the shading device may also be different from that of the reagent bottle, or not match it. Furthermore, the shading device 400 comprises a weight sensor 5. The weight sensor 5 is arranged on the tray, and adapted for detecting the weight of the reagent bottle. The weight sensor 5 can communicate with an analysis device in a wired or wireless manner, and send the weight of the reagent bottle to the analysis device. As Fig. 4 shows, the shading device 400 further comprises a display device 6. The weight sensor 5 is in communication with the display device 6, so that the display device 6 displays the weight of the reagent bottle or the amount of reagent remaining.

[0028] According to an embodiment of the present utility model, the shading device comprises an openable top cover which maintains light-tightness. When the reaction bottle is inserted or withdrawn, the top cover of the shading device must be opened first.

[0029] The embodiments described above serve merely to explain the present utility model, without limiting it. Those skilled in the art could make various changes and modifications without departing from the scope of the present utility model. Therefore all equivalent technical solutions should also be included in the scope of disclosure of the present utility model.

Claims

1. A reagent bottle shading device, comprising: a tray and a sidewall connected to the tray; wherein a top end of the sidewall forms a top end opening, to allow the insertion and withdrawal of a reagent bottle; wherein a base hole is provided on the tray, the size of the base hole being adapted for the entry of a finger.
2. The reagent bottle shading device as claimed in

claim 1, wherein the side wall covers at least 1/5 of the height of the reagent bottle below a bottle cap, or at least 1/2 of the height, or at least 4/5 of the height; or the sidewall completely covers the height of the reagent bottle below the bottle cap; or the sidewall completely covers the entire reagent bottle.

3. The reagent bottle shading device as claimed in any of claims 1, wherein the shape of the sidewall is the same as the shape of a corresponding reagent bottle.
4. The reagent bottle shading device as claimed in claim 1, wherein the tray and the sidewall are formed as a single piece.
5. The reagent bottle shading device as claimed in claim 1, wherein a slit is provided on the sidewall.
6. The reagent bottle shading device as claimed in claim 1, further comprising a weight sensor adapted for detecting the weight of a reagent bottle.
7. The reagent bottle shading device as claimed in claim 6, wherein the weight sensor communicates with an analysis device in a wired or wireless manner.
8. The reagent bottle shading device as claimed in claim 1, further comprising a display device in communication with the weight sensor.
9. The reagent bottle shading device as claimed in claim 6, further comprising an openable top cover.
10. An, analysis device, comprising:

a reagent bottle shading device, comprising a tray and a sidewall connected to the tray; wherein a top end of the sidewall forms a top end opening, to allow the insertion and withdrawal of a reagent bottle; and further comprising a weight sensor adapted for detecting the weight of the reagent bottle;
a reagent addition means adapted for adding reagent to the reagent bottle; and
a control means adapted for controlling the reagent addition means according to the weight of the reagent bottle detected by the weight sensor.

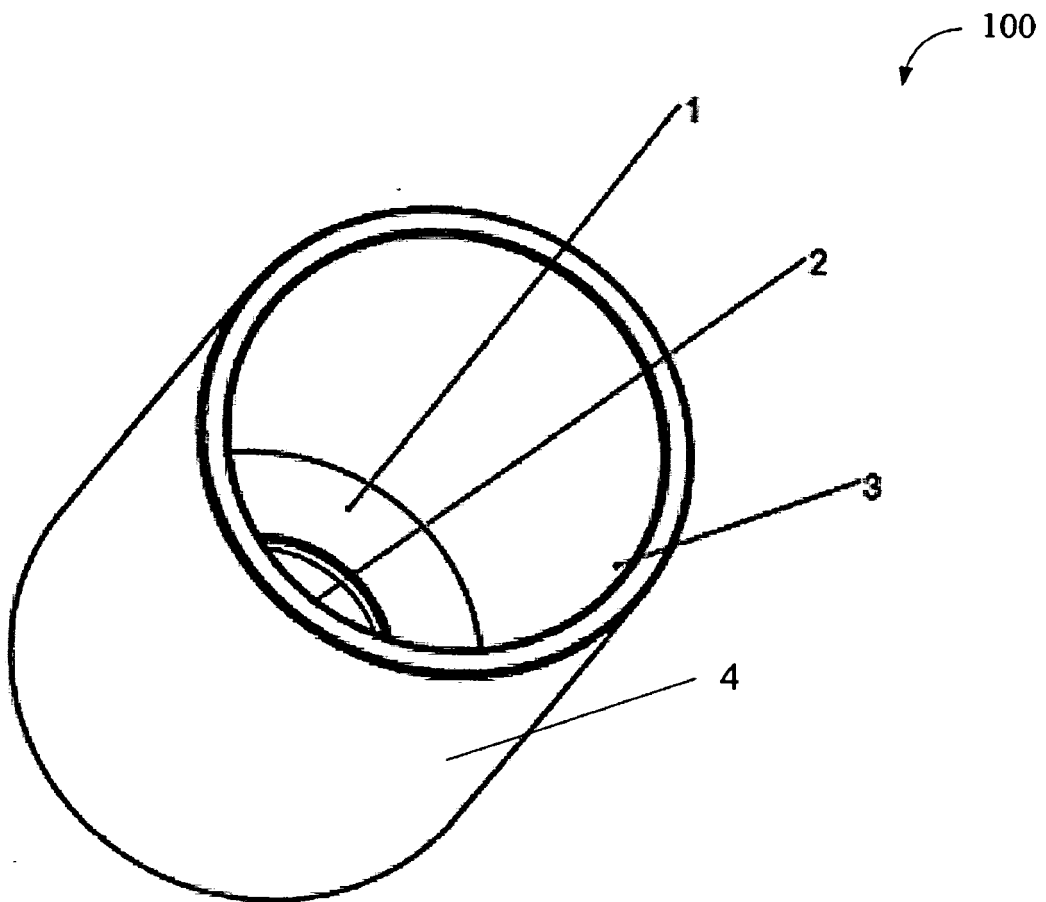


Fig. 1

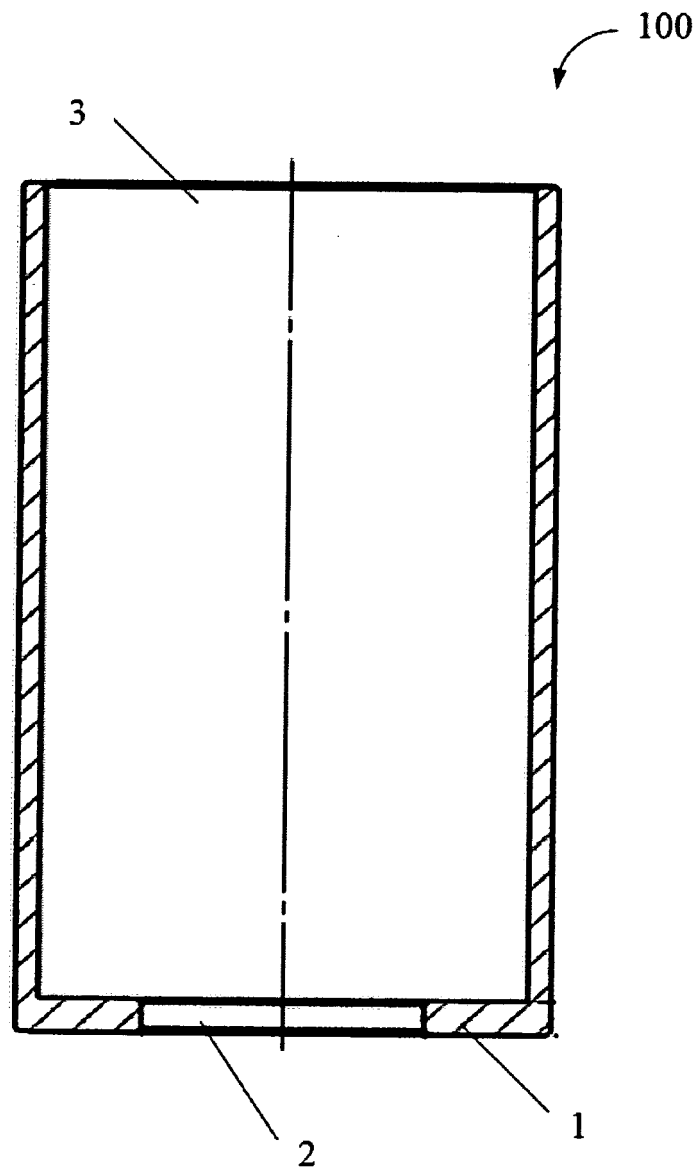


Fig. 2

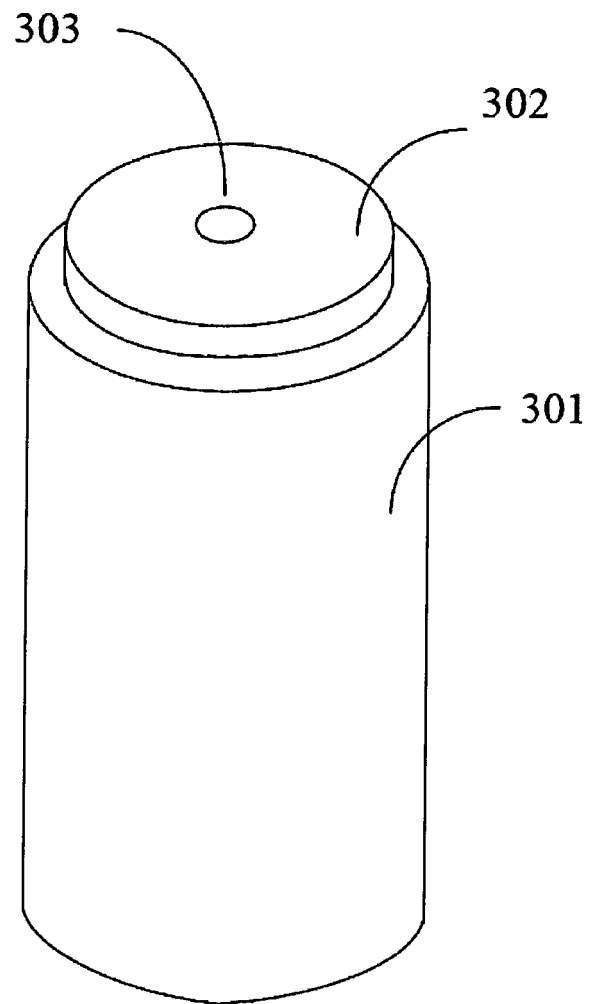


Fig. 3

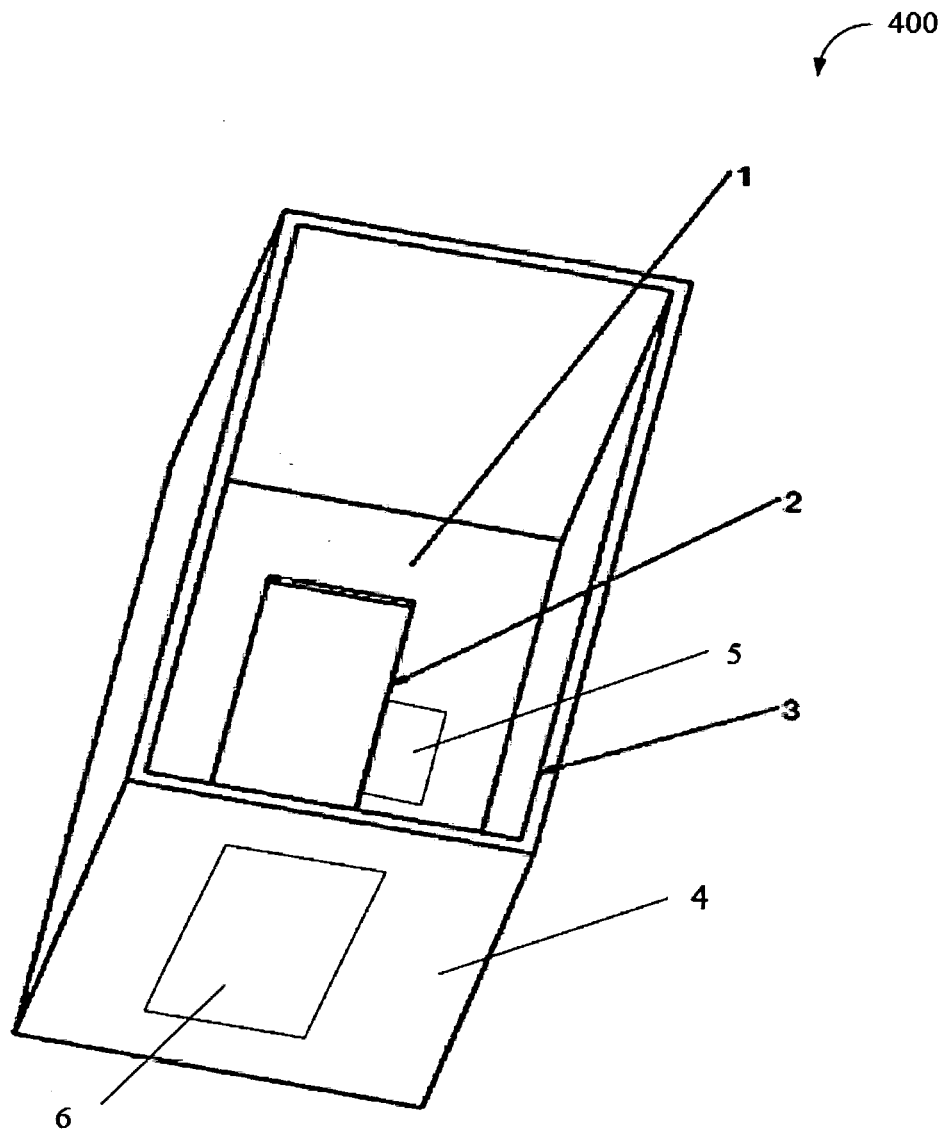


Fig. 4