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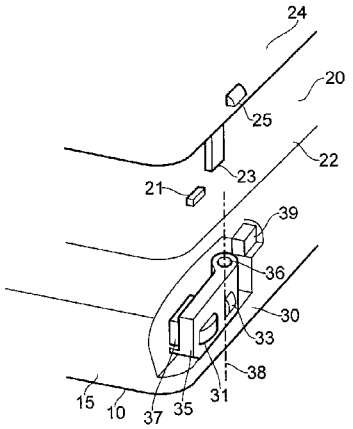


FIG. 2

(57) Abstract: An apparatus and cover for an apparatus wherein the apparatus comprises: a locking portion configured to lock a cover to the apparatus; a pushing portion configured so that movement of the cover in a first direction causes movement of the pushing portion towards a second direction; and wherein the pushing portion and the locking portion are arranged so that movement of the pushing portion towards the second direction causes movement of the locking portion towards the second direction and the movement of the locking portion towards the second direction enables the release of the cover from the apparatus.

A COVER AND APPARATUS FOR LOCKING THE COVER

TECHNOLOGICAL FIELD

Examples of the present disclosure relate to a cover and apparatus for locking the cover. In particular, they relate to a cover and apparatus for locking the cover to an electronic device.

BACKGROUND

Apparatus such as electronic devices sometimes have removable covers. This enables the user to remove the cover for example, to insert or remove a battery or to insert or remove a memory card.

It is useful to enable such covers to be easily removed by the user but yet securely attached to the electronic device.

BRIEF SUMMARY

According to various but not necessarily all examples of the disclosure there may be provided an apparatus comprising: a locking portion configured to lock a cover to the apparatus; a pushing portion configured so that movement of the cover in a first direction causes movement of the pushing portion towards a second direction; and wherein the pushing portion and the locking portion are arranged so that movement of the pushing portion towards the second direction causes movement of the locking portion towards the second direction and the movement of the locking portion towards the second direction enables the release of the cover from the apparatus.

In some examples the pushing portion may comprise a protruding portion configured to abut a corresponding protruding portion on the cover.

In some examples the locking portion may comprise a latch portion configured to engage with a corresponding latch portion on the cover.

In some examples the locking portion and the pushing portion may be provided on a support member. The support member may be attached to the apparatus via a pivot which is configured to enable the support member to rotate about an axis. The axis may be parallel to the first direction. The axis may be perpendicular to the first direction. The pushing portion may be located closer to the pivot than the locking portion is located to the pivot.

In some examples the apparatus may further comprise a first resilient member configured to cause the locking portion to move towards the second direction. In some examples the apparatus may further comprise a second resilient member configured to cause the cover to move towards the first direction. The second resilient member may have a higher modulus of elasticity than the first resilient member.

In some examples there may be provided a chassis for an electronic device comprising an apparatus as described above. The chassis may comprise a plurality of apparatus as described above.

According to various but not necessarily all examples of the disclosure there may be provided a cover comprising: a locking portion configured to engage with a locking portion of an apparatus to enable the cover to be locked to the apparatus; and a pushing portion configured to abut a pushing portion of the apparatus such that movement of the cover towards a first direction causes movement of the pushing portion of the apparatus towards a second direction.

In some examples the cover may comprise a rear surface and an edge surface extending around at least a portion of a perimeter of the rear surface. The edge surface may extend around all of the perimeter of the rear surface.

In some examples the locking portion may be provided on an edge surface of the cover.

In some examples the pushing portion may be provided on an edge surface of the cover.

In some examples there may be provided a cover configured to be attached to an apparatus as described above.

In some examples there may be provided a system comprising an apparatus as described above and a cover as described above.

The apparatus may be for locking a cover to an electronic device.

BRIEF DESCRIPTION

For a better understanding of various examples that are useful for understanding the detailed description, reference will now be made by way of example only to the accompanying drawings in which:
Figs. 1A and 1B illustrate an electronic device;
Fig. 2 illustrates an apparatus;
Figs. 3A to 3F illustrate an apparatus
Figs. 4A to 4D illustrate an apparatus; and
Figs. 5A to 5D illustrate an electronic device.

DETAILED DESCRIPTION

The Figures illustrate an apparatus 30 comprising: a locking portion 31 configured to lock a cover 20 to the apparatus 30; a pushing portion 33 configured so that movement of the cover 20 in a first direction causes movement of the pushing portion 33 towards a second direction; and wherein the pushing portion 33 and the locking portion 31 are arranged so that movement of the pushing portion 33 towards the second direction causes movement of the locking portion 31 towards the second direction and the movement of the locking portion 31 towards the second direction enables the release of the cover 20 from the apparatus 30.

In the following description the term coupled means operationally coupled and any number or combination of intervening elements can exist (including no intervening elements).

Figs. 1A and 1B illustrate an electronic device 10. The electronic device 10 may be for example, a mobile cellular telephone, a personal computer, a camera, a gaming device, a personal digital assistant, an electronic book reader, a personal music player, a tablet computer or any other similar electronic device 10 which may comprise a cover 20 which may be removed by the user of the electronic device 10. The electronic device 10 may be a handheld device which can be carried in a user's hand, handbag or pocket of their clothing for example.

Fig. 1A illustrates a front view of the electronic device 10 and Fig. 1B illustrates a rear view of the same electronic device 10. A user interface 11 may be provided on the front of the electronic device 10. The user interface 11 may comprise, for example, a touch sensitive display.

The electronic device 10 of Figs. 1A and 1B may comprise a chassis. The chassis may provide an internal frame for the electronic device 10. The components of the electronic device 10 may be attached to the chassis. For example a printed wiring board, a power source and other components may be attached to the chassis.

The electronic device 10 comprises a cover 20. The cover 20 may form part of the outer housing of the electronic device 10. The cover 20 may be attached to the chassis of the electronic device 10.

The cover 20 may provide a protective housing to the components of the electronic device 10. The cover 20 may protect the components of the electronic device 10 from the ingress of fluid and/or dirt and may also provide protection from physical impacts.

The cover 20 may be made of any suitable material. For example the cover 20 may be made of plastic. The cover may be stiff so that the cover does not deform very much when the cover is pressed by a user of the electronic device 10.

The cover 20 comprises a rear surface 24. The rear surface 24 of the cover 20 may extend over a portion of the rear surface of the electronic device 10. In the example of Figs. 1A and 1B the rear surface 24 of the cover 20 extends over the whole of the rear surface of the electronic device 10.

The cover 20 also comprises an edge surface 22. The edge surface 22 extends around at least a portion of the perimeter of the rear surface 24. In the example of Figs. 1A and 1B the cover 20 may extend around all of the perimeter of the rear surface 24. In such examples the cover 20 may cover five of the six surfaces of the electronic device 10.

Fig. 2 illustrates an apparatus 30 according to an example of the disclosure. The apparatus 30 may be configured to enable the cover 20 to be locked to the electronic device 10. The apparatus 30 may be configured to enable a user to release the locking mechanism and remove the cover 20 from the electronic device 10.

The apparatus 30 may be provided on an edge of the chassis 15 of the electronic device 10. In the particular example of Fig. 2 the apparatus 30 is provided at a corner of the chassis 15. It is to be appreciated that in other examples the apparatus 30 may be provided in other locations of the chassis 15. For example the apparatus 30 may be provided along one of the sides of the chassis 15.

The apparatus 30 comprises a locking portion 31 and a pushing portion 33.

The locking portion 31 comprises means for locking the cover 20 to the apparatus 30. In the example of Fig. 2 the locking portion 31 comprises a latch portion which is configured to engage with a corresponding latch portion

21 on the cover 20. When the cover 20 is attached to the electronic device 10 the two latch portions may engage with each other to prevent the cover 20 from moving relative to the electronic apparatus 10.

The pushing portion 33 comprises means for converting a force applied to the cover 20 in a first direction to a force applied to the locking portion in a second direction. In some examples the pushing portion 33 may comprise means for converting movement of the cover 20 towards a first direction into movement of the locking portion 31 towards a second direction. The first and second directions may be perpendicular to each other.

As an example, the electronic device 10 may be arranged horizontally with the rear surface 24 pointing upwards. For instance the electronic device 10 may be resting on a flat surface such as a table with the front surface contacting the table and the rear surface 24 facing upwards. The user may then push downwards on the cover 20. The user may push the cover 20 in a region close to the locations where the apparatus 30 is positioned on the chassis of the electronic device 10. When the user pushes downwards this may move the cover 20 downwards relative to the apparatus 30. The pushing portion 33 may be configured to convert the downwards movement of the cover 20 into movement of the locking portion 31 in the horizontal plane.

In the example of Fig. 2 the pushing portion 33 comprises a protruding portion 33. The protruding portion 33 may be configured to abut a corresponding protruding portion 23 of the cover 20 so that when the cover 20 moves towards the first direction the protruding portion of the cover 20 pushes against the protruding portion 33 of the apparatus 30. The respective protruding portions 33 may be shaped so that movement of the cover 20 towards the first direction causes movement of the pushing portion 33 towards the second direction.

In Fig. 2 the locking portion 31 and the pushing portion 33 are provided on a support member 35. The support member 35 may comprise a surface and the locking portion 31 and the pushing portion 33 may extend out of the

surface of the support member 35. In some examples the pushing portion 33 may be an area on the surface of the support member 35, so does not extend from the surface of the support member 35. In some examples the support member 35, the locking portion 31 and the pushing portion 33 may be formed as a single component.

The support member 35 may be formed from any suitable material. For example the support member 35 may be formed from a plastic.

The support member 35 may be rigid. The support member 35 may be rigid to the extent that it does not bend or flex significantly when a force is applied to apparatus 30 to release the locking members 31.

The support member 35 may be attached to the chassis 15 of the electronic device 10. The support member 35 may be attached to the chassis 15 via a pivot 36. The pivot 36 may enable the support member to rotate about an axis 38. The axis of rotation 38 is indicated by the dashed line in Fig. 2.

In the example of Fig. 2 both the locking portion 31 and the pushing portion 33 are provided on the same side of the pivot 36. The pushing portion 33 is positioned closer to the pivot 36 than the locking portion 31 is positioned to the pivot 36.

The apparatus 30 also comprises a first resilient member 37. The first resilient member 37 may be provided between the chassis 15 and the support member 35. The first resilient member 37 may be configured so that if the support member 35 is pushed inwards the first resilient member 37 provides a restoring force which pushes the support member 35 back outwards.

The first resilient member 37 may comprise any suitable material which will return back to its original shape after being deformed. In the example of Fig. 2 the material may return back to its original shape after being compressed. The material may comprise foam, silicone rubber or any other suitable resilient material.

The apparatus 30 also comprises a second resilient member 39. The second resilient member 39 may be provided on the chassis 15 of the electronic device 10. The second resilient member 39 may be configured to contact a portion of the cover 20. The second resilient member 39 may be configured so that if the cover 20 is pushed downwards the second resilient member 39 provides a restoring force which pushes the cover 20 upwards.

The second resilient member 39 may comprise any suitable material which will return back to its original shape after being deformed. In the example of Fig. 2 the material may return back to its original shape after being compressed. The second resilient member 39 may have a higher modulus of elasticity than the first resilient member 37. The second resilient member 39 may comprise any suitable material such as rubber, thermoplastic polyurethane (TPU) or any other material.

A section of the cover 20 is also illustrated in Fig. 2. The section of the cover 20 comprises a locking portion 21 and a pushing portion 23. The locking portion 21 and the pushing portion 23 are provided on an inner-side of the edge surface 22 of the cover 20. The locking portion 21 and the pushing portion 23 are configured so that in use they contact the corresponding locking portion 31 and pushing portion 33 of the apparatus 30.

The locking portion 21 of the cover 20 may comprise a latch portion which may be configured to engage with the corresponding locking portion 31 of the apparatus 30.

The pushing portion 23 may comprise a protruding portion 23. The protruding portion 23 may be configured so that when the cover 20 is pushed towards a first direction the pushing portion 23 of the cover 20 pushes against the corresponding pushing portion 33 of the apparatus 30. The protruding portion 23 may be shaped so that movement of the protruding portion 23 towards the first direction causes movement of the pushing portion 33 towards the second direction.

The cover 20 may also comprise a further protruding portion 25 which may be configured to contact the second resilient member 39. In some examples the further protruding portion 25 may be configured to contact the second resilient member 39 when the cover 20 is attached to the chassis 15 of the electronic device 10. In some examples the further protruding portion 25 may be configured to contact the second resilient member 39 when a user presses the cover 20 and the electronic device 10.

Figs. 3A to 3F illustrate examples of the apparatus 30 in use. The same reference numerals have been used for the same components of Fig. 2.

Fig. 3A illustrates a cross section of an apparatus 30. The cross section is taken through a plane in the x-y plane. In the example of Fig. 3A the z-direction extends into the page. The z-direction may extend parallel to the depth of the electronic device 10 and cover 20.

In Fig. 3A the apparatus 30 is illustrated in the position in which the apparatus 30 may be arranged when a cover 20 is attached to the electronic device 10. The cover 20 has not been illustrated in Fig. 3A for clarity. It is to be appreciated that in this position the locking portion 31 would engage with a corresponding locking portion 21 of the cover 20 to prevent the cover 20 from moving relative to the electronic device 10. The locking portions 31, 21 may prevent movement of the cover 20 relative to the electronic device 10 in the z-direction.

The support member 35 may be arranged so that surface of the support member is parallel with the edge of the chassis 15 of the electronic device 10. The locking portion 31 and the pushing portion 33 may extend out of the surface of the support member 35 so that they may engage with the corresponding portions of the cover 20.

The axis of rotation of the pivot 36 may be parallel with the z-axis. Therefore when the support member 35 rotates about the pivot 36 this may cause

movement of the locking portion 31 and the pushing portion 33 in the x-y plane but not in the z-direction.

The first resilient member 37 is provided between the support member 35 and the chassis 15 of the electronic device 10. The first resilient member 37 may be configured to bias the support member 35 towards the cover 20.

The second resilient member 39 is provided adjacent to the support member 35.

Fig. 3B illustrates the apparatus 30 in a release position. A user may configure the apparatus 30 in the release position by pressing the electronic device 10 and/or the cover 20. The user may press the electronic device 10 and/or the cover by applying a force to the section of the electronic device 10 and/or cover 20 where the apparatus 30 is located. The forces may have at least a component which is parallel to the z-direction.

The components of the force applied in the z-direction causes the cover 20 to move towards the z-direction. In the cross section illustrated in Figs. 3A and 3B the applied force may cause the cover 20 to move into the page.

The movement of the cover 20 causes the further protruding portion 25 of the cover 20 to compress the second resilient member 39. The compression of the second resilient member 39 creates a restoring force in the second resilient member 39. The restoring force may act in an opposing direction to the force applied by the user. For example if the applied force causes the cover 20 to move downwards in the z-direction, the restoring force of the second resilient member 39 may act to move the cover 20 upwards in the z-direction.

As the cover moves downwards in the z-direction this also causes the pushing portion 23 of the cover 20 to push against the pushing portion 33 of the apparatus 30 as is illustrated in Fig. 3C.

Fig. 3C is a cross section of the apparatus 30 in the x-z plane. In the example of Fig. 3C the y-direction extends into the page. The y-direction may extend parallel to the length of the electronic device 10 and cover 20.

Fig. 3C illustrates the cross sectional shapes of the respective pushing portions 23, 33 in an example of the disclosure. In the example of Fig. 3C the pushing portion 33 of the apparatus 30 comprises a convex curved section 51 which protrudes from the surface of the support member 35. The pushing portion 23 of the cover 20 comprises a protrusion with a flat surface 53. The flat surface 53 is provided at an angle to the x-axis. In the example of Fig. 3C the flat surface 53 is provided at an angle of approximately 45 degrees to the x-axis. The angle of the flat surface 53 and curve of the protruding portion 33 may be arranged so that when flat surface 53 is pushed downwards in the z-direction, as indicated by the arrow 59, the flat surface 53 pushes against the curved surface of the pushing portion 33 of the apparatus 30 and pushes the pushing portion 33 inwards towards the x-direction.

It is to be appreciated that in other examples of the disclosure other shapes and configurations of the respective pushing portions 33, 23 may be used.

The force in the x-direction which is applied to the pushing portion 33 of the apparatus 30 causes rotation of the support member 35 about the pivot 36. This causes the support member 35 to rotate to the position illustrated in Fig. 3B. In Fig. 3B the support member 35 has rotated clockwise about the pivot 36 so that the end of the support member 35 which is opposite the pivot 36 has moved towards the chassis 15 of the electronic device 10.

The movement of the support member 35 to the position illustrated in Fig. 3B has caused the compression of the first resilient member 37. The compression of the first resilient member 37 creates a restoring force in the first resilient member 37. The restoring force may act in an opposing direction to the force applied to the support member 35 by the pushing portion 23 of the cover 20. For example where the applied force has caused the

support member 35 to rotate clockwise the restoring force of the first resilient member 37 may act to rotate the support member 35 anti-clockwise.

The rotation of the support member 35 causes the movement of the locking portion 31 of the apparatus 30 relative to the locking portion 21 of the cover 20 as illustrated in Fig. 3D.

As the pushing portion 33 is closer to the pivot 36 than the locking portion 31 the locking portion 31 may move a greater linear distance than the pushing portion 33 does. This may enable a relatively large linear movement to be obtained by pushing the pushing portion 33 for a small distance. For example the pushing portion 33 may move 2mm and the locking portion may move 5mm.

The rotation of the support member 35 comprises components of movement in the x-direction as indicated by the arrow 57 in Fig. 3D. This causes the locking portion 31 of the apparatus 30 to move away from the lock portion 21 of the cover 20 so that the two locking portions 21, 31 are disengaged. When the two locking portions 21, 31 are disengaged a gap 58 may be provided between the two locking portions 21, 31. Once the two locking portions 21, 31 are disengaged the cover 20 may be moved upwards in the z-direction.

Once the locking portions 21, 31 have been released the user may stop applying the forces. Once the forces applied by the user are no longer applied to the apparatus 30 and cover 20 the restoring forces applied by the resilient members 37, 39 may act to move the support member 35 and the cover 20 respectively.

The restoring force of the first resilient member 37 acts to rotate the support member 35 anti-clockwise and push the locking portion 31 back towards the locking portion 21 of the cover. The restoring force of the second resilient member 39 acts to move the cover 20 upwards in the z-direction. As the second resilient member 39 has a higher modulus of elasticity than the first

resilient member 37 the second resilient member 39 may move back to its equilibrium position before the first resilient member 37 so that the cover 20 is moved upwards by the second resilient member 39 before the locking portions can re-engage. This enables the user to remove the cover 20 from the electronic device 10.

Figs. 3E and 3F illustrate another example apparatus 10. The example apparatus 30 of Figs. 3E and 3F is similar to that of Figs. 3A to 3D except that the axis of rotation 36 of the support member 35 is arranged to be parallel to the y axis rather than the z axis. In these examples the axis of rotation 36 of the support member 35 may be perpendicular to the direction in which the cover 29 may be pushed or pressed by a user.

Fig. 3E illustrates a cross section of an example apparatus 30. The cross section is taken through a plane in the x-y plane similar to the plane used in Fig. 3A. In the example of Fig. 3E the z-direction extends into the page. The z-direction may extend parallel to the depth of the electronic device 10 and cover 20.

In Fig. 3E the apparatus 30 is illustrated in the position in which the apparatus 30 may be arranged when a cover 20 is attached to the electronic device 10. The cover 20 has not been illustrated in Fig. 3E for clarity.

Fig. 3F is a cross section of the apparatus 30 of Fig. 3E in the x-z plane. In the example of Fig. 3F the y-direction extends into the page. The y-direction may extend parallel to the length of the electronic device 10 and cover 20.

In Fig. 3F the apparatus 30 is illustrated in the position in which the apparatus 30 may be arranged when a cover 20 is attached to the electronic device 10. The cover 20 is also illustrated in Fig. 3F.

It can be seen in Fig. 3F that the locking portion 21 of the cover 20 engages with the locking portion 31 of the apparatus 30 to prevent the cover from moving relative to the electronic device 10.

In the examples of Fig. 3E and 3F when the cover 20 is pushed downwards towards the z-direction the flat surface 53 of the pushing portion 23 of the cover 20 pushes against the curved surface of the pushing portion 33 of the apparatus 30. This pushes the pushing portion 33 of the apparatus 30 inwards towards the x-direction. The force in the x-direction which is applied to the pushing portion 33 of the apparatus 30 causes rotation of the support member 35 about the pivot 36 and releases the locking portions 21, 31. As in the examples of Figs. 3A to 3D the restoring force of the first resilient member 37 acts to rotate the support member 35 anti-clockwise and push the locking portion 31 back towards the locking portion 21 of the cover and the restoring force of the second resilient member 39 acts to move the cover 20 upwards in the z-direction.

Figs. 4A to 4D illustrate a user applying forces to an electronic device 10 in order to attach and release a cover 20.

Fig. 4A illustrates a user applying a force to the rear surface of the cover 20, as indicated by arrow 71, and the front surface of the electronic device 10 as indicated by arrow 73. The applied forces may enable the apparatus 30 to be used to lock the cover 20 to the electronic device 10. The two forces may be applied simultaneously so that the user may be squeezing the electronic device 10.

The forces may be applied in a first direction which may extend parallel to the z-axis as illustrated in Fig. 4A. Fig. 4B illustrates the electronic device 10 once the cover 20 has been locked in position.

Fig. 4C illustrates a user applying a force to the rear surface of the cover 20, as indicated by arrow 75, and the front surface of the electronic device 10 as indicated by arrow 77. The applied forces may enable the cover 20 to be released from the apparatus 30 and removed from the electronic device 10. The two forces may be applied simultaneously so that the user may be squeezing the electronic device 10.

The forces may be applied in a first direction which may extend parallel to the z-axis as illustrated in Fig. 4C. Fig. 4D illustrates the electronic device 10 once the cover 20 has released from the locked position and partially removed from the electronic device 10.

Figs. 5A to 5D illustrate electronic devices 10 comprising at least one apparatus 30 as described above.

In Fig. 5A the electronic device 10 comprises one apparatus 30. The apparatus 30 is provided along one of the sides of the chassis 15 of the electronic device 10. The electronic device 10 also comprises other mechanisms 81 for holding the cover 20 in position relative to the electronic device 10. For example the other mechanisms 81 may comprise snap fit connections or any other suitable types of connections. In the example of Fig. 5A two snap fit connections are provided. The snap fit connections are provided on an opposite side of the chassis 15 of the electronic device 10 to the locking apparatus 30.

In Fig. 5B the electronic device 10 comprises two locking apparatus 30 as described above. The two locking apparatus 30 are provided on two corners of the chassis 15 of the electronic device 10. A snap fit mechanism 81 or any other suitable mechanism 81 may be provided on the other two corners of the chassis 15 of the electronic device 10.

In Fig. 5C the electronic device 10 comprises three locking apparatus 30 as described above. The three locking apparatus 30 are provided on three corners of the chassis 15 of the electronic device 10. A snap fit mechanism 81 or any other suitable mechanism 81 may be provided on the other two corners of the chassis 15 of the electronic device 10.

In Fig. 5D the electronic device 10 comprises four locking apparatus 30 as described above. The four locking apparatus 30 may be provided on each of

the four corners of the chassis 15 of the electronic device 10 so that every corner of the chassis 15 has a corresponding locking portion.

Examples of the apparatus 30 and cover 20 described above provide the advantage that they enable a cover 20 to be attached to an electronic device 10 without requiring any lateral or sliding motion of the cover 20. This makes the apparatus 30 suitable for use with covers 20 which extend around the perimeter of the electronic device 10 which might not be able to move laterally relative to the electronic device 10.

The apparatus 30 may be small so it may require only a small space within the electronic device 10.

Also the apparatus 30 has few moving components. This makes the apparatus 30 simple to manufacture and incorporate into electronic devices 10. It may also make the apparatus 30 more reliable and less susceptible to failure so that the cover 20 can be removed and attached from the electronic device 10 many times during the lifetime of the electronic device 10.

Also the apparatus 30 may be made from materials such as rubbers and plastics. This may enable a secure locking apparatus 30 to be provided which does not require any metal parts. This may be useful for electronic devices 10 which comprise an antenna as there are no metal components which may adversely affect the performance of the antenna.

The term 'comprise' is used in this document with an inclusive not an exclusive meaning. That is any reference to X comprising Y indicates that X may comprise only one Y or may comprise more than one Y. If it is intended to use 'comprise' with an exclusive meaning then it will be made clear in the context by referring to "comprising only one." or by using "consisting".

In this detailed description, reference has been made to various examples. The description of features or functions in relation to an example indicates that those features or functions are present in that example. The use of the term "example" or "for example" or "may" in the text denotes, whether explicitly

stated or not, that such features or functions are present in at least the described example, whether described as an example or not, and that they can be, but are not necessarily, present in some of or all other examples. Thus "example", "for example" or "may" refers to a particular instance in a class of examples. A property of the instance can be a property of only that instance or a property of the class or a property of a sub-class of the class that includes some but not all of the instances in the class.

Although examples of the present disclosure have been described in the preceding paragraphs with reference to various examples, it should be appreciated that modifications to the examples given can be made without departing from the scope of the claims. For instance, in some examples the cover 20 of the electronic device 10 may also deform in order to assist in the release of the locking portions 21, 31. In such examples the cover may be made of a relatively stiff material so that the cover 20 returns to its original shape before the first resilient member 37 does.

Features described in the preceding description may be used in combinations other than the combinations explicitly described.

Although functions have been described with reference to certain features, those functions may be performable by other features whether described or not.

Although features have been described with reference to certain embodiments, those features may also be present in other embodiments whether described or not.

Whilst endeavoring in the foregoing specification to draw attention to those features believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

WHAT IS CLAIMED IS:

1. An apparatus comprising:

a locking portion configured to lock a cover to the apparatus;

a pushing portion configured so that movement of the cover in a first direction causes movement of the pushing portion towards a second direction; and wherein

the pushing portion and the locking portion are arranged so that movement of the pushing portion towards the second direction causes movement of the locking portion towards the second direction and the movement of the locking portion towards the second direction enables the release of the cover from the apparatus.

2. An apparatus as claimed in claim 1 wherein the pushing portion comprises a protruding portion configured to abut a corresponding protruding portion on the cover.

3. An apparatus as claimed in any preceding claim wherein the locking portion comprises a latch portion configured to engage with a corresponding latch portion on the cover.

4. An apparatus as claimed in any preceding claim wherein the locking portion and the pushing portion are provided on a support member.

5. An apparatus as claimed in claim 4 wherein the support member is attached to the apparatus via a pivot which is configured to enable the support member to rotate about an axis.

6. An apparatus as claimed in claim 5 wherein the axis is parallel to the first direction.

7. An apparatus as claimed in claim 5 wherein the axis is perpendicular to the first direction.

8. An apparatus as claimed in any of claims 5 to 7 wherein the pushing portion is located closer to the pivot than the locking portion is located to the pivot.

9. An apparatus as claimed in any preceding claim further comprising a first resilient member configured to cause the locking portion to move towards the second direction.

10. An apparatus as claimed in claim 9 further comprising a second resilient member configured to cause the cover to move towards the first direction.

11. An apparatus as claimed in claim 10 wherein the second resilient member has a higher modulus of elasticity than the first resilient member.

12. A chassis for an electronic device comprising an apparatus as claimed in any of claims 1 to 11.

13. A chassis for an electronic device as claimed in claim 12 wherein the chassis comprises a plurality of apparatus as claimed in any of claims 1 to 11.

14. A cover comprising:

a locking portion configured to engage with a locking portion of an apparatus to enable the cover to be locked to the apparatus; and

a pushing portion configured to abut a pushing portion of the apparatus such that movement of the cover towards a first direction causes movement of the pushing portion of the apparatus towards a second direction.

15. A cover as claimed in claim 14 wherein the cover comprises a rear surface and an edge surface extending around at least a portion of a perimeter of the rear surface.

16. A cover as claimed in claim 15 wherein the edge surface extends around all of the perimeter of the rear surface.

17. A cover as claimed in any of claims 15 to 16 wherein the locking portion is provided on an edge surface of the cover.

18. A cover as claimed in any of claims 15 to 17 wherein the pushing portion is provided on an edge surface of the cover.

19. A cover configured to be attached to the apparatus of any of claims 1 to 13.

20. A system comprising an apparatus as claimed in any of claims 1 to 13 and a cover as claimed in any of claims 14 to 19.

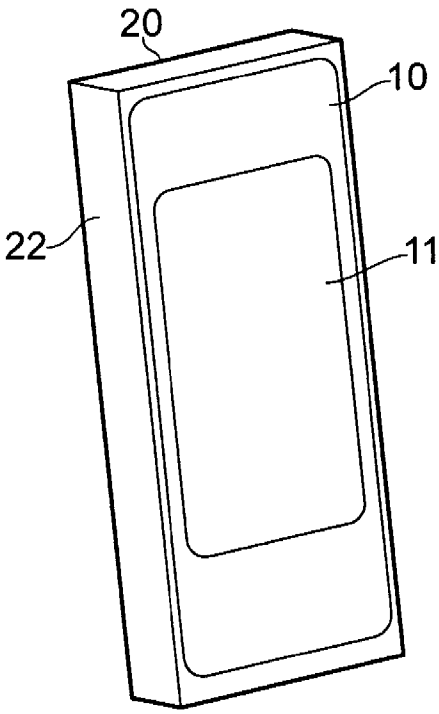


FIG. 1A

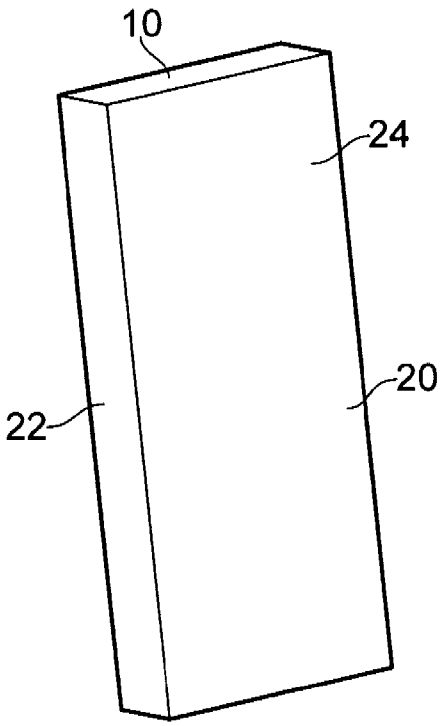


FIG. 1B

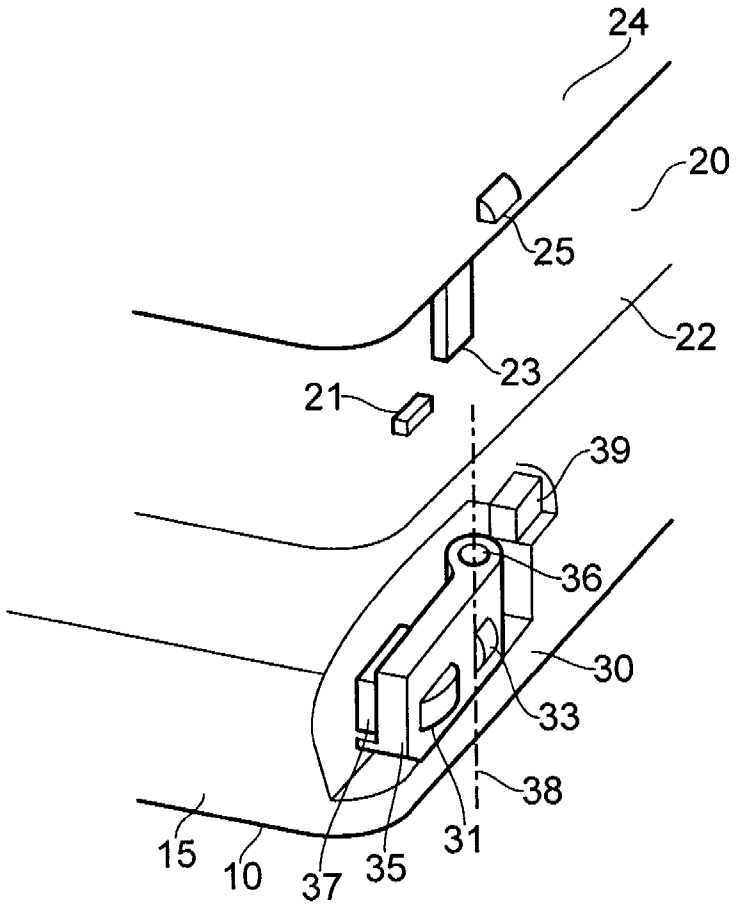


FIG. 2

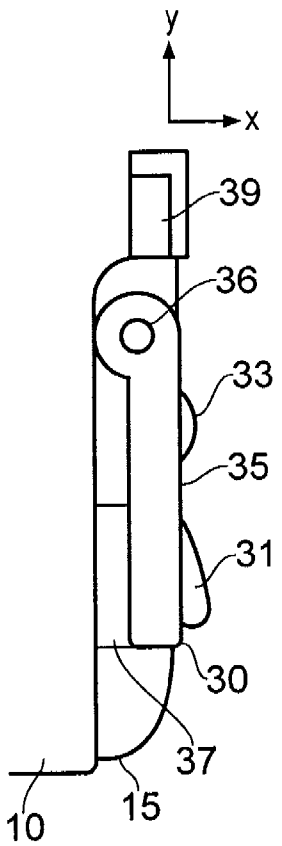


FIG. 3A

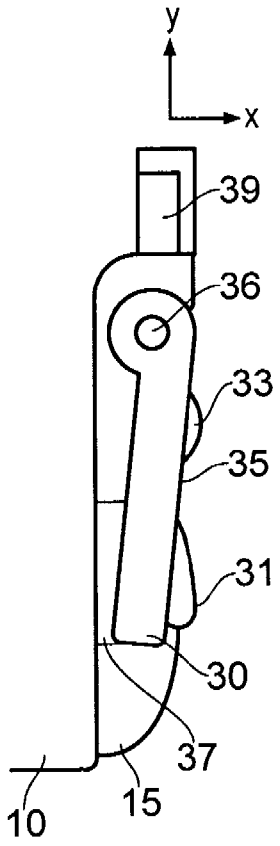


FIG. 3B

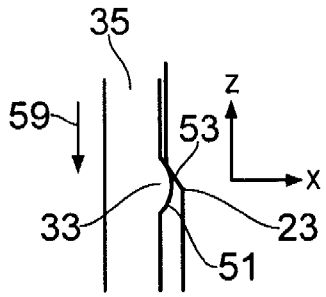


FIG. 3C

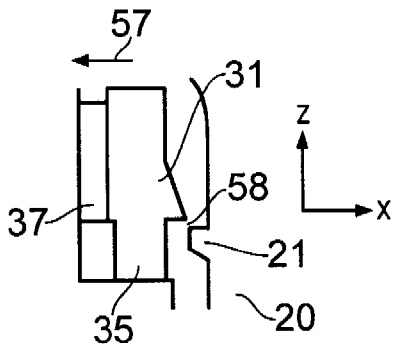


FIG. 3D

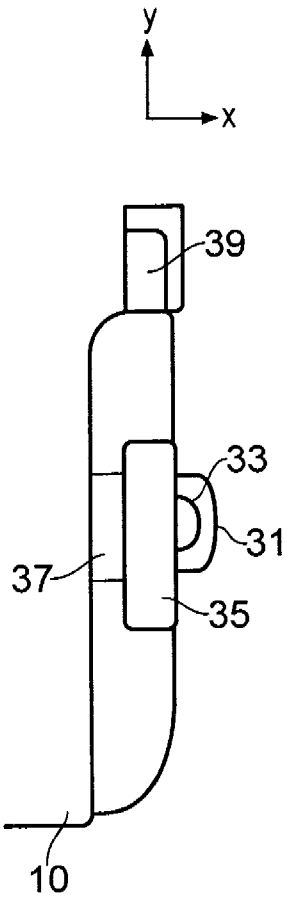


FIG. 3E

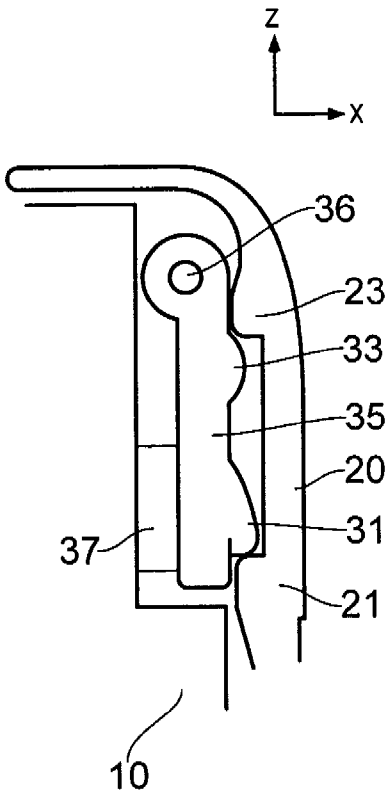


FIG. 3F

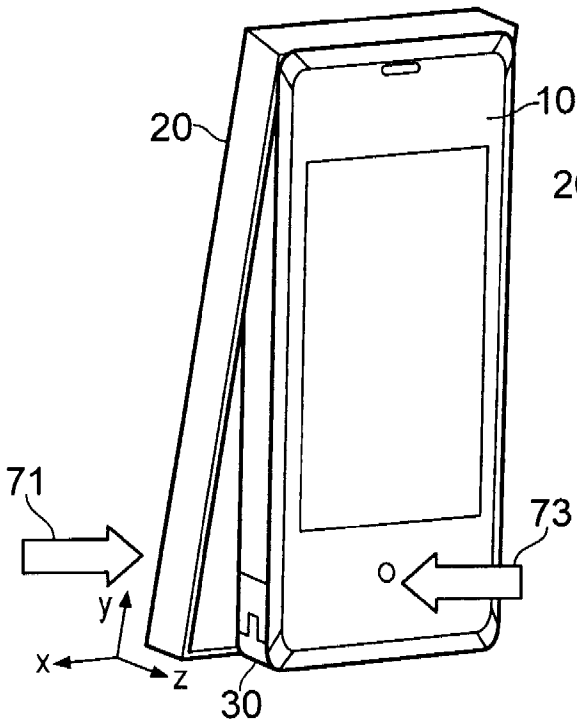


FIG. 4A

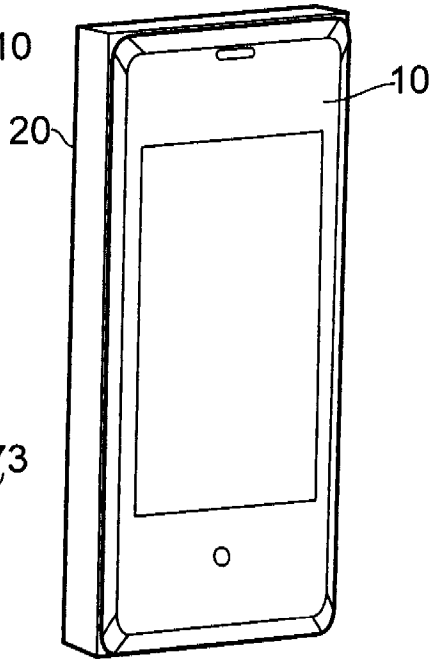


FIG. 4B

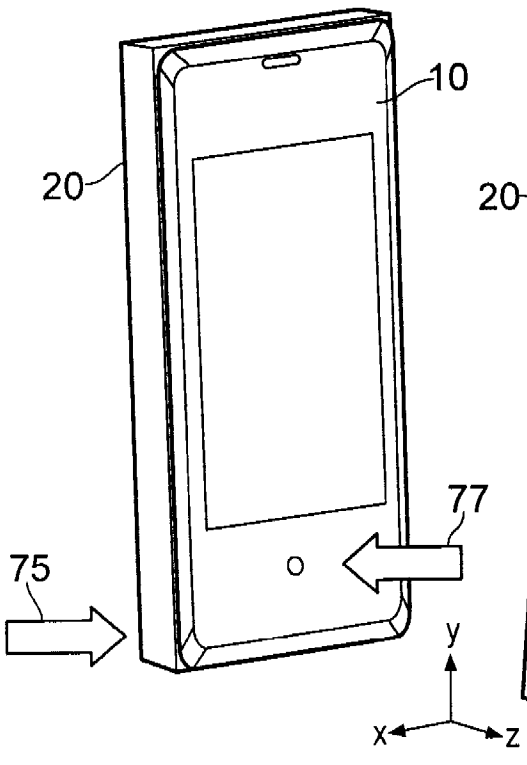


FIG. 4C

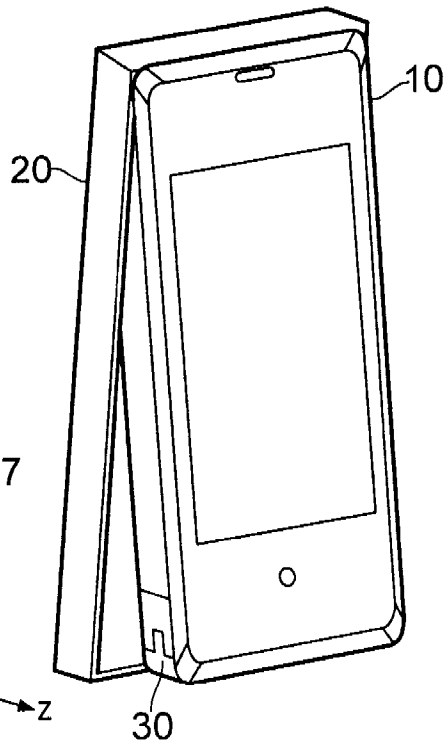


FIG. 4D

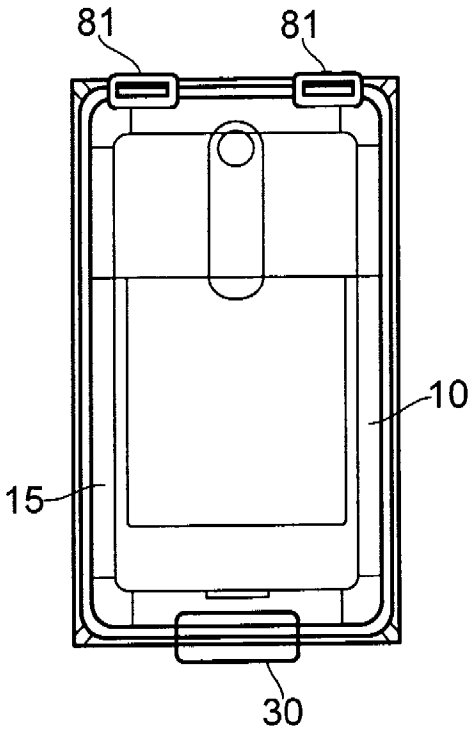


FIG. 5A

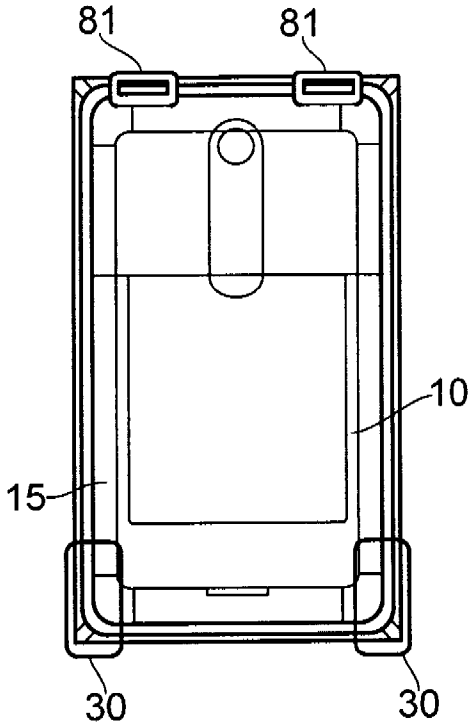


FIG. 5B

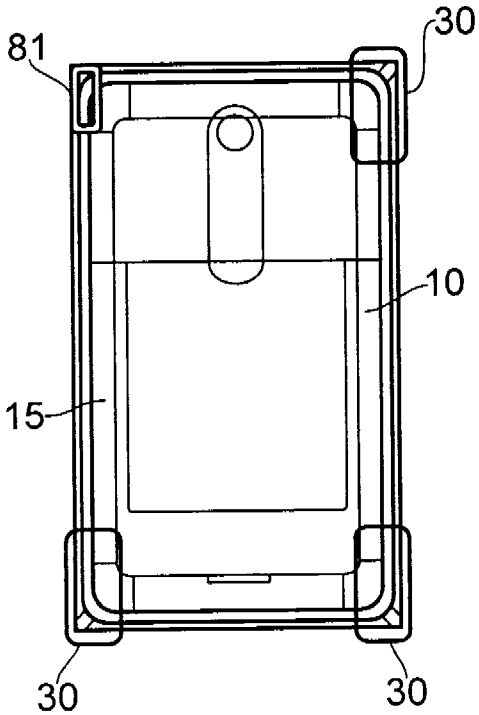


FIG. 5C

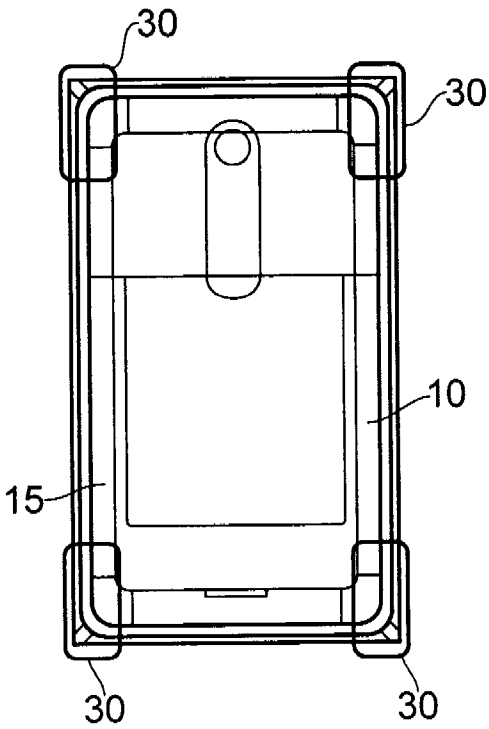


FIG. 5D

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2012/087387

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

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)

CNABS, CNTXT, CNKI, VEN: mobile, portable, wireless, cellular, handset, phone, telephone, terminal, lock, push, housing, cover, vertical, perpendicular, protruding, direction

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 1725656 A (SAMSUNG ELECTRONICS CO., LTD.) 25 January 2006(25.01.2006)see the whole document	1-20
A	CN 1685538 A (MATSUSHITA ELECTRIC IND CO., LTD.) 19 October 2005(19.10.2005) see the whole document	1-20
A	CN 101950996 A (LIU, Zhongchen) 19 January 2011(19.01.2011) see the whole document	1-20
A	CN 102104127 A (QINGDAO HISENSE MOBILE COMMUNICATION TEC) 22 June 2011(22.06.2011) see the whole document	1-20
A	CN 1832229 A (SHENZHEN FUTAIHONG PRECISION IND CO., LTD.) 13 September 2006(13.09.2006) see the whole document	1-20

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 August 2013(30.08.2013)	**12 Sep. 2013 (12.09.2013)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer FAN, Xiaohan Telephone No. (86-10)62411429

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2012/087387

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 1725656 A	25.01.2006	US 2006019530 A1	26.01.2006
		KR 20060008575 A	27.01.2006
		KR 100689432 B1	08.03.2007
CN 1685538 A	19.10.2005	EP 1551068 A1	06.07.2005
		JPWO 2004034488 S	09.02.2006
		KR 20050091699 A	15.09.2005
		KR 100862943 B1	14.10.2008
		JP 4294591 B2	15.07.2009
		US 2006079298 A1	13.04.2006
		WO 2004034488 A1	22.04.2004
		US 7242973 B2	10.07.2007
		CN 100385710C	30.04.2008
		AU 2002368277 A1	04.05.2004
CN 101950996 A	19.01.2011	None	
CN 102104127 A	22.06.2011	None	
CN 1832229 A	13.09.2006	US 7629074 B2	08.12.2009
		US 2006205269 A1	14.09.2006