Title: AIR SUCTION APPARATUS FOR VINYL BAG

Abstract: The present invention relates to an air suction apparatus for plastic bags, in which when an opened plastic bag is sealed for storage of the unused portions of the contents such as food and the like therein, the inside of the plastic bag is easily made vacuum tight so as to stably store the contents contained in the bag for a long time period. The air suction apparatus comprises a base member disposed at the inside of a plastic bag, a cover member disposed at the outside of a plastic bag so as to be engaged with the base member disposed at the inside of the plastic bag, and locking means for engaging the base member with the cover member, whereby air in the plastic bag is discharged to the outside through the base member and the cover member.
Description

AIR SUCTION APPARATUS FOR VINYL BAG

Technical Field

[1] The present invention relates to an air suction apparatus for plastic bags, and more particularly, to such an air suction apparatus for plastic bags, in which when an opened plastic bag is sealed for storage of the unused portions of the contents such as food and the like therein, the inside of the plastic bag is easily made vacuum tight so as to stably store the contents contained in the bag for a long time period.

Background Art

[2] FIG. 1 is a perspective view showing a conventional closure for flexible bags, and FIG. 2 is a cross-sectional view showing the closure for flexible bags of FIG. 1 (see U.S. Patent No. 3,141,221).

[3] As shown in FIGS. 1 and 2, the closure for flexible bags includes an inner bar 12 taking the shape of an elongated rod, and a holder 13 for wrapping the inner bar 12.

[4] The holder 13 has a fitting groove formed longitudinally on the arcuate inner surface thereof.

[5] Thus, the holder 13 is formed in a 'C'-shape in cross-section as shown in FIG. 2.

[6] A method of sealing a flexible bag B using such a closure device includes placing the inner bar 12 at a neck portion adjacent to an entrance opening of the flexible bag B, and then folding the neck portion of the flexible bag B so as to wrap the inner bar 12.

[7] In this state, as shown in FIG. 2, the holder 13 is wrappingly engaged with the inner bar 12 with the neck portion of the flexible bag B impinged therebetween.

[8] An alternate sealing method includes fixing the inner bar 12 to the holder 13 in such a fashion that the inner bar is not moved, and then slidingly pressing the holder 13 while abutting against the inner bar 12 in a state of folding the neck portion of the flexible bag B so as to allow the flexible bag B to be interposed between the inner bar 12 and the holder 13.

[9] In this case, since the holder 13 has the arcuate fitting groove formed on the inner surface thereof, the flexible bag B is engagingly interposed between the inner bar 12 and the holder 13 through the fitting groove and the entrance opening of the flexible bag B is exposed to the outside of the holder 13.

[10] Since the neck portion adjacent to the entrance opening of the flexible bag B is press-fit between the holder 13 and the inner bar 12, the entrance opening of the flexible bag is temporarily sealed.

[II] In this case, the holder 13 or inner bar 12 may include protrusions formed on the inner or outer surface thereof so as to further press the flexible bag B.
However, this conventional closure device entails a problem in that since it functions to merely seal the flexible bag B without vacuuming, in case where the food and the like contained in the flexible bag B is stored for a long period of time, the food and the like may be spoiled by means of air remained inside the flexible bag B.

Disclosure of Invention

Technical Problem

Accordingly, the present invention has been made in an effort to solve the above problem occurring in the prior art, and it is an object of the present invention to provide an air suction apparatus for plastic bags, in which when an opened plastic bag is sealed for storage of the unused portions of the contents such as food and the like therein, the inside of the plastic bag is easily made vacuum tight so as to stably store the contents contained in the bag for a long time period.

Technical Solution

To accomplish the above object, the present invention provides an air suction apparatus for plastic bags, comprising: a base member disposed at the inside of a plastic bag; a cover member disposed at the outside of a plastic bag so as to be engaged with the base member disposed at the inside of the plastic bag; and locking means for engaging the base member with the cover member, whereby air in the plastic bag is discharged to the outside through the base member and the cover member.

The cover member base member includes a wedge-shaped punch mouthed thereto for incising the plastic bag, and the base member includes an insertion portion formed protruding at the center thereof so as to allow the wedge-shaped punch to be inserted thereto.

The wedge-shaped punch has a suction hole formed at the center thereof so as to fluidically intercommunicate the base member and the cover member.

Also, the wedge-shaped punch includes opening and closing means mounted thereon so as to open or close the suction hole.

The cover member has a discharge hole formed at the center thereof so as to allow the suction hole and the outside of the cover member to fluidically communicate with each other therethrough, and the cover member includes a press plate mounted therein in such a fashion as to be elastically supported by a spring so as to open or close the discharge hole.

The base member has a plurality of first air suction channels formed radially on an open bottom circumferential end thereof so as to fluidically intercommunicate the insertion portion and the outside of the base member.

The insertion portion is internally penetrated vertically, and the air suction apparatus further includes a flow channel-changing member fit around the insertion portion in
such a fashion as to surround the bottom and the outer circumference of the insertion portion, wherein the flow channel-changing member and the insertion portion define a plurality of second air suction channels therebetween so as to allow air to flow therethrough.

The insertion portion or the flow channel-changing member has a plurality of flow channel-forming protrusions formed protrudingly on the outer circumferential surface of the insertion portion or the inner circumferential surface of the flow channel-changing member in the axial direction of the insertion portion, so that a plurality of second air suction channels is defined between the flow channel-forming protrusions so as to allow air to flow therethrough.

The locking means includes a retaining protrusion formed on one of the outer circumferential surface of the wedge-shaped punch and the inner circumferential surface of the insertion portion, and a retaining groove formed on the other of the outer circumferential surface of the wedge-shaped punch and the inner circumferential surface of the insertion portion so as to allow the retaining protrusion to be fit thereto. The retaining groove includes a guide groove into which the retaining protrusion is to be inserted, and a fixing groove formed in a direction perpendicular to the guide groove in such a fashion as to communicate with the guide groove, so that the retaining protrusion is inserted into the fixing groove by the rotation of the wedge-shaped punch to cause the wedge-shaped punch to be engaged with the base member.

Advantageous Effects

As described above, an air suction apparatus for plastic bags according to the present invention has an advantageous effect in that has the following advantageous effects.

The inside of a plastic bag can be made vacuum tight through the partial incising of the plastic bag to enable to safely store the contents such as the food and the like contained in the plastic bag for a long time period.

Also, since the inventive air suction apparatus is constructed independently of a closure unit for sealing the entrance opening of the plastic bag, it is easy to use.

In addition, since the inventive air suction apparatus is constructed to be coupled with the plastic bag, it can be used continuously once being installed on the plastic bag.

Brief Description of the Drawings

FIG. 1 is a perspective view showing the outer appearance of a conventional closure for flexible bags according to the prior art;

FIG. 2 is a cross-sectional view of FIG. 1;

FIG. 3 is a perspective view showing the outer appearance of an air suction apparatus for plastic bags according to an embodiment of the present invention;

FIG. 4 is an exploded perspective view showing the air suction apparatus for plastic
bags, when viewed from one direction, according to an embodiment of the present invention;

[31] FIG. 5 is an exploded perspective view showing the air suction apparatus for plastic bags, when viewed from the other direction, according to an embodiment of the present invention;

[32] FIG. 6 is a view showing the operation process of locking means of the air suction apparatus for plastic bags according to an embodiment of the present invention;

[33] FIG. 7 is a perspective view showing a state where the air suction apparatus for plastic bags according to an embodiment of the present invention is mounted on a plastic bag;

[34] FIG. 8 is a cross-sectional view taken along the line A-A of FIG. 3;

[35] FIG. 9 is a cross-sectional view showing a state where a hose connected to a vacuum pump is inserted into the air suction apparatus for plastic bags in FIG. 8; and

[36] FIG. 10 is a cross-sectional view taken along the line B-B of FIG. 7.

Mode for the Invention

[37] Reference will now be made in detail to a preferred first embodiment of the present invention with reference to the attached drawings.

[38] FIG. 3 is a perspective view showing the outer appearance of an air suction apparatus for plastic bags according to an embodiment of the present invention, FIG. 4 is an exploded perspective view showing the air suction apparatus for plastic bags, when viewed from one direction, according to an embodiment of the present invention, FIG. 5 is an exploded perspective view showing the air suction apparatus for plastic bags, when viewed from the other direction, according to an embodiment of the present invention, FIG. 6 is a view showing the operation process of locking means of the air suction apparatus for plastic bags according to an embodiment of the present invention, FIG. 7 is a perspective view showing a state where the air suction apparatus for plastic bags according to an embodiment of the present invention is mounted on a plastic bag, FIG. 8 is a cross-sectional view taken along the line A-A of FIG. 3, FIG. 9 is a cross-sectional view showing a state where a hose connected to a vacuum pump is inserted into the air suction apparatus for plastic bags in FIG. 8, and FIG. 10 is a cross-sectional view taken along the line B-B of FIG. 7.

[39] As shown in FIGs. 3 to 10, the air suction apparatus for plastic bags 300 according to an embodiment of the present invention includes a base member 200, a cover member 100, a wedge-shaped punch 110, a flow channel-changing member 220 and the like.

[40] The base member 200 is insertedly disposed at the inside of the plastic bag 300 and has an insertion portion 210 formed protruding at the center thereof.

[41] The insertion portion 210 is vertically penetrated so as to allow the wedge-shaped
punch 110 to be insertedly mounted thereto.

Also, the base member 200 has a plurality of first air suction channels 230 formed radially on an open bottom circumferential end thereof so as to fluidically inter-communicate the insertion portion 210 and the outside of the base member.

The flow channel-changing member 220 is formed in a cylindrical shape which is opened at a top thereof and is closed at a bottom thereof so as to be fit around the insertion portion 210 in such a fashion as to surround the bottom and the outer circumference of the insertion portion 210.

The flow channel-changing member 220 has a plurality of flow channel-forming protrusions 221 formed protrudingly on the inner circumferential surface thereof in the axial direction of the insertion portion 210, so that a plurality of second air suction channels 240 is defined between the flow channel-forming protrusions 221 and the outer circumferential surface of the insertion portion 210 so as to allow air to flow therethrough as shown in FIGs. 8 to 10.

That is, air introduced into the base member 200 through the first air suction channels 230 is introduced into the insertion portion 210 through the second air suction channels 240 defined between the flow channel-changing member 220 and the insertion portion 210.

In this case, since the flow channel-changing member 220 encircles the bottom and the outer circumference of the insertion portion 210, the air introduced into the base member 200 through the first air suction channels 230 flows from the top to the bottom of the outer circumferential surface of the insertion portion 210 and then is introduced into the insertion portion 210.

In addition, the flow channel-forming protrusions 221 may be replaced with flow channel-forming grooves, and the insertion portion 210 may have the flow channel-forming protrusions 221 or flow channel-forming grooves formed on the outer circumferential surface thereof so as to define the second air suction channels 240.

The cover member 100 is disposed at the outside of the plastic bag 300 so as to be engaged with the base member 200 disposed at the inside the plastic bag 300.

That is, one side of the plastic bag 300 is positioned between the base member 200 and the cover member 100.

The wedge-shaped punch 110 is mounted to the bottom of the cover member 100 and is inserted into the insertion portion 210. The wedge-shaped punch 110 serves to incise the part of the plastic bag 300 positioned between the cover member 100 and the base member 200.

To this end, the bottom end of the wedge-shaped punch 110 is formed sharply in a conical shape.

The cover member 100 and the wedge-shaped punch 110 may be formed integrally
with each other, but are preferably manufactured in different constructions for the purpose of assembly of different constructions and then assembled using a screw or the like.

[53] The wedge-shaped punch 110 has a suction hole 111 formed at the center thereof so as to fluidically communicate with the base member 200 and the cover member 100.

[54] More specifically, as shown in FIGs. 8 and 9, the wedge-shaped punch 110 is inserted into the insertion portion 210 of the base member 200 so as to cause the suction hole 111 to fluidically intercommunicate the insertion portion 210 and the cover member 100.

[55] The suction hole 111 may be formed to be exposed to the outside of the wedge-shaped punch 110, but is preferably formed in such a fashion as to penetrate through the inside of the wedge-shaped punch 110.

[56] Also, the wedge-shaped punch 110 includes opening and closing means 120 mounted thereon so as to open or close the suction hole 111. The opening and closing means 120 is positioned on the top of the suction hole 111.

[57] That is, the bottom of the suction hole 111 fluidically communicates with the insertion portion 210, and the opening and closing means 120 is seated on the top of the suction hole 111.

[58] The opening and closing means 120 is formed in the shape of a movable ball and is disposed on the top of the suction hole 111.

[59] Further, as shown in FIG. 4, a plurality of flow channel grooves 116 is formed on the inner circumference of the top of the suction hole 111 on which the opening and closing means 120 is seated, so that air can flow therethrough upon the movement of the opening and closing means 120.

[60] In this case, the flow channel grooves 116 is closed when the opening and closing means 120 is lowered and is opened when the opening and closing means 120 is lifted so as to secure the amount of air flow as much as possible.

[61] Moreover, the suction hole 111 has a guide protrusion 115 formed circumferentially protrudingly on the top edge thereof so as to prevent the horizontal escape of the opening and closing means 120.

[62] At this time, the annular guide protrusion 115 may have a plurality of through-holes formed therein so as to activate the flow of air.

[63] In the meantime, the cover member 100 has a discharge hole 150 formed at the center thereof so as to allow the suction hole 111 and the outside of the cover member to fluidically communicate with each other therethrough.

[64] The cover member 100 includes a press plate 140 and a spring 130 mounted therein. The press plate is adapted to open or close the discharge hole and the spring is adapted to be elastically supported in the direction of discharge hole 150.
Preferably, the press plate 140 includes a gasket 160 mounted on the top surface thereof so as to seal a space between the press plate 140 and the discharge hole 150.

Also, preferably, the wedge-shaped punch 100 or the cover member 100 abutting against the base member 200 includes a gasket 170 mounted on the bottom thereof so as to be in close contact with the plastic bag 300 or the base member 200.

Further, the air suction apparatus for plastic bags of the present invention includes locking means for engaging the base member and the cover member with each other.

More specifically, the locking means serves to engage the wedge-shaped punch 110 fixedly mounted to the cover member 100 with the base member 200.

The locking means includes a retaining groove 112 formed on the outer circumferential surface of a lower portion of the wedge-shaped punch 110 to be inserted into the insertion portion 210, and a retaining protrusion 212 formed on the inner circumferential surface of the insertion portion 210 so as to be fit into the retaining groove 112 of the wedge-shaped punch.

The retaining groove 112 includes a guide groove 113 formed on the outer circumferential surface of the lower portion of the wedge-shaped punch 110 in a direction parallel with an insertion direction of the wedge-shaped punch 110, and a fixing groove 114 formed on the outer circumferential surface of the lower portion of the wedge-shaped punch 110 in a direction perpendicular to the guide groove 113 in such a fashion as to communicate with the guide groove 113.

Thus, as shown in FIG. 6, the retaining protrusion 212 is inserted into the guide groove 113 and then is moved toward the fixing groove 114 by means of the rotation of the wedge-shaped punch 110 so as to cause the wedge-shaped punch 110 and the base member 200 to be engaged with each other.

At this time, the guide groove 113 is opened downwardly from the bottom of the wedge-shaped punch 110 so as to facilitate insertion of the retaining protrusion 212 thereto when the wedge-shaped punch 110 is inserted into the insertion portion 210.

Alternatively, the locking means may include the retaining groove 112 formed on the inner circumferential surface of the insertion portion 210 and the retaining protrusion 212 formed on the outer circumferential surface of the lower portion of the wedge-shaped punch 110 so as to engage the wedge-shaped punch 110 and the base member 200 with each other.

Now, the operation process of the present invention as constructed above will be described hereinafter with reference to the accompanying drawings.

As shown in FIG. 7, after the base member 200 is inserted into the plastic bag 300, the wedge-shaped punch 110 and the cover member 100 are engaged with the base member 200 with them positioned at the outside of the plastic bag 300.

In other words, the cover member 100 mounted with the wedge-shaped punch 110 is
engaged with the base member 200 at the outside of the plastic bag 300 with the base member 200 inserted into the plastic bag 300.

Then, one side of the plastic bag 300 is positioned between the cover member 100 and the base member 200, and the other side of the plastic bag 300 is positioned at the bottom of the base member 200.

Also, the wedge-shaped punch 110 is in tight contact with the one side of the plastic bag 300 by means of the gasket 170 mounted at the bottom of the wedge-shaped punch 110.

In this case, as shown in FIG. 8, the plastic bag 300 is incised by means of the wedge-shaped punch 110, and the wedge-shaped punch 110 is inserted into the insertion portion 210 of the base member 200. At this time, the retaining protrusion 212 formed on the inner circumference of the insertion portion 210 is positioned in the guide groove 113 of the retaining groove 112 formed on the outer circumference of the wedge-shaped punch 110 as shown in FIGs. 9(a) and 9(b).

In this state, a user turns the wedge-shaped punch 110 and the cover member 100.

Then, as shown in FIG. 9(c), the retaining protrusion 212 is moved from the guide groove 113 to the fixing groove 114 communicating with the guide groove 113 in such a fashion as to be oriented perpendicularly to the guide groove 113, so that the wedge-shaped punch 110 and the cover member 100 are engaged with the base member 200.

Thereafter, foods or the like is put into the plastic bag 300 through the opening of the plastic bag 300, and as shown in FIG. 7, the opening of the plastic bag 300 is sealed using a known closure device 400 (such as the closure or sealing device as discussed in the Background art as the introduction part of the specification, and the like).

The sealing operation can be performed by means of zipper, heat-sealing, etc., besides the closure device 400 shown in FIG. 7.

Subsequently, as shown in FIG. 9, the hose 500 connected to the vacuum pump (not shown) is inserted into the discharge hole 150.

The insertion of the hose 500 into the discharge hole allows the press plate 140 to be lowered while pressing the spring 130 so as to fluidically intercommunicate the inside and the outside of the cover member 100.

In this state, when the vacuum pump is operated, the ball-shaped opening and closing means 120 is moved upward by means of the suction force of the vacuum pump to cause the top of the suction hole 111 to be opened.

Thus, air in the plastic bag 300 is introduced into the base member 200 through the first air suction channels 230 and then is moved to the insertion portion 210 through the second air suction channels 240 defined between the flow channel-forming protrusions 221 and the outer circumference of the insertion portion 210.

The air moved to the inside of the insertion portion 210 is introduced into a lower
portion of the suction hole 111 formed centrally at the inside of the wedge-shaped punch 110.

In this case, since the opening and closing means 120 is in a state of being moved upward by means of the suction force of the vacuum pump and a plurality of flow channel grooves 116 is formed on the top edge of the suction hole 111, the air flowing out to the top of the suction hole 111 flows into the cover member 100 through the flow channel grooves 116 and then is discharged to the outside through the discharge hole 150, the hose 500 and the vacuum pump.

In the meantime, it is the same as the well-known art that the hose 500 has a plurality of holes formed on the outer circumferential surface thereof so as to allow air to be introduced into the hose therethrough, or the press plate 140 has a protrusion formed on the top thereof so as to allow a space for air to pass through to be defined between the hose 500 and the press plate 140.

In addition, the flow channel-changing member 220 surrounds the bottom and the outer circumference of the insertion portion 210, so that air introduced into the base member 200 through the first air suction channels 230 is moved upward along the outer circumferential surface of the flow channel-changing member 220, but is not directly introduced into the lower portion of the insertion portion 210, and then is moved downward along the second air suction channels 240. Thus, in case where liquid contents are contained in the plastic bag 300, the liquid contents can be prevented from being directly introduced into the insertion portion 210 so as to be moved to the cover member 100 and the vacuum pump.

When the vacuuming of plastic bag 300 is completed and the hose 500 is removed from the cover member, the press plate 140 is moved upward by means of the elasticity of the spring being compressed so as to close the discharge hole 150. Also, the opening and closing means 120 comes into tight contact with the top of the suction hole 111 by the vacuum pressure of the inside of the plastic bag 300.

Therefore, the plastic bag 300 is maintained in a vacuum-tight state.

When it is desired to de-vacuum the inside of the plastic bag 300, the wedge-shaped punch 110 and the cover member 100 can be rotated to be disassembled from the base member 200 to cause air to be introduced into the plastic bag through the incised portion of the plastic bag 300. Alternatively, the closure device sealing the opening of the plastic bag 300 can be opened to cause air to be introduced into the plastic bag.

It is to be appreciated that the air suction apparatus for plastic bags of the present invention is not limited to the specific embodiments as described above, but can be modified or changed variously by those skilled in the art without departing from the technical spirit and scope of the present invention, as defined by the appended claims.
Industrial Applicability

When it is desired to seal an opened plastic bag for storage of the unused portions of the contents such as food and the like therein, the inventive air suction apparatus is mounted on the plastic bag so as to be connected to a separate vacuum pump and the like, so that the inside of the plastic bag can be easily made vacuum tight to stably store the contents contained in the bag for a long time period.
Claims

[1] An air suction apparatus for plastic bags, comprising:
   a base member disposed at the inside of a plastic bag;
   a cover member disposed at the outside of a plastic bag so as to be engaged with
   the base member disposed at the inside of the plastic bag; and
   locking means for engaging the base member with the cover member,
   whereby air in the plastic bag is discharged to the outside through the base
   member and the cover member.

[2] The air suction apparatus according to claim 1, wherein the cover member
   comprises a wedge-shaped punch mouthed thereto for incising the plastic bag,
   and the base member includes an insertion portion formed protrudingly at the
   center thereof so as to allow the wedge-shaped punch to be inserted thereto.

[3] The air suction apparatus according to claim 2, wherein the wedge-shaped punch
   comprises a suction hole formed at the center thereof so as to fluidically inter-
   communicate the base member and the cover member.

[4] The air suction apparatus according to claim 3, wherein the wedge-shaped punch
   comprises opening and closing means mounted thereon so as to open or close the
   suction hole.

[5] The air suction apparatus according to claim 3, wherein the cover member has a
   discharge hole formed at the center thereof so as to allow the suction hole and the
   outside of the cover member to fluidically communicate with each other
   therethrough, and the cover member includes a press plate mounted therein in
   such a fashion as to be elastically supported by a spring so as to open or close the
   discharge hole.

[6] The air suction apparatus according to claim 2, wherein the base member has a
   plurality of first air suction channels formed radially on an open bottom circum-
  ferential end thereof so as to fluidically intercommunicate the insertion portion
   and the outside of the base member.

[7] The air suction apparatus according to claim 2, wherein the insertion portion is
   internally penetrated vertically, and the air suction apparatus further comprises a
   flow channel-changing member fit around the insertion portion in such a fashion
   as to surround the bottom and the outer circumference of the insertion portion,
   wherein the flow channel-changing member and the insertion portion define a
   plurality of second air suction channels therebetween so as to allow air to flow
   therethrough.

[8] The air suction apparatus according to claim 7, wherein the insertion portion or
   the flow channel-changing member has a plurality of flow channel-forming
protrusions formed protrudingly on the outer circumferential surface of the
insertion portion or the inner circumferential surface of the flow channel-
changing member in the axial direction of the insertion portion, so that a plurality
of second air suction channels is defined between the flow channel-forming
protrusions so as to allow air to flow therethrough.

[9] The air suction apparatus according to claim 2, wherein the locking means
comprises a retaining protrusion formed on one of the outer circumferential
surface of the wedge-shaped punch and the inner circumferential surface of the
insertion portion, and a retaining groove formed on the other of the outer circum-
ferential surface of the wedge-shaped punch and the inner circumferential
surface of the insertion portion so as to allow the retaining protrusion to be fit
thereto.

[10] The air suction apparatus according to claim 9, wherein the retaining groove
includes a guide groove into which the retaining protrusion is to be inserted, and
a fixing groove formed in a direction perpendicular to the guide groove in such a
fashion as to communicate with the guide groove, so that the retaining protrusion
is inserted into the fixing groove by the rotation of the wedge-shaped punch to
cause the wedge-shaped punch to be engaged with the base member.
A. CLASSIFICATION OF SUBJECT MATTER

B65D 30/24(2006.01)1

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 8 B65D, F16K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS (KIPO internal) "valve", "air", "bag"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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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
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"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
06 AUGUST 2008 (06 08 2008)

Date of mailing of the international search report
06 AUGUST 2008 (06.08.2008)

Name and mailing address of the ISA/KR

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Authorized officer

PAEK, Jin Wook

Telephone No 82-42-481-8458
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