660527

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AUSTRALIA

PATENTS ACT 1990

PATENT REQUEST: STANDARD PATENT

I/We, the Applicant(s)/Nominated Person(s) specified below, request I/We be granted a patent for the invention disclosed in the accompanying standard complete specification.

[70,71] Applicant(s)/Nominated Person(s):

Canon Kabushiki Kaisha, incorporated in Japan, of 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, JAPAN

[54] Invention Title:

Storage Container

[72] Inventor(s):

Tsutomu Kawai, Akira Miyakawa, Hideki Yamaguchi, Hitoshi Nakamura and Hisashi Morioka

[74] Address for service in Australia:

Spruson & Ferguson, Patent Attorneys
Level 33 St Martins Tower
31 Market Street
Sydney New South Wales Australia (Code **SF**)

Details of Basic Application(s):

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Canon Kabushiki Kaisha

By:

J. Yoshida

Registered Patent Attorney

S 035860 030393

IRN: 234189

INSTR CODE: 59510

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NOTICE OF ENTITLEMENT

I, John Gordon Hinde, of Spruson & Ferguson, St Martins Tower, 31 Market Street, Sydney, New South Wales 2000, Australia, being the patent attorney for the Applicant(s)/Nominated Person(s) in respect of an application entitled:

Storage Container

state the following:-

The Applicant(s)/Nominated Person(s) has/have entitlement from the actual inventor(s) as follows:-

> The Applicant(s)/Nominated Person(s), by virtue of a Contract of Employment between the actual inventor(s) as employee(s) and the Applicant(s)/Nominated Person(s) as employer(s), is a person entitled to have the patent assigned to it if a patent were granted on an application made by the actual inventor(s).

The Applicant(s)/Nominated Person(s) is/are the applicant(s) of the basic application(s) listed on the Patent Request. The basic application(s) listed on the Patent Request is/are the application(s) first made in a Convention Country in respect of the invention.

DATED this 2nd day of March 19 93

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John Gordon Hinde

IRN: INSTR CODE:

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STORAGE CONTAINER

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(71) Applicant(s)
CANON KABUSHIKI KAISHA

(72) Inventor(s)
TSUTOMU KAWAI; AKIRA MIYAKAWA; HIDEKI YAMAGUCHI; HITOSHI NAKAMURA; HISASHI MORIOKA

(74) Attorney or Agent
SPRUSON & FERGUSON , GPO Box 3898, SYDNEY NSW 2001

(56) Prior Art Documents
US 5244087
EP 439728
US 5231416

(57) Claim

1. A container for containing an ink jet cartridge exchangeably mountable on an ink jet apparatus having an ink jet head provided with an ink discharge section for discharging an ink and an ink tank for storing the ink to be supplied to said ink jet head, said container comprising:

a lower housing for accommodating said ink jet cartridge;

an upper housing for covering said lower housing, said upper housing being reciprocable about a pivot point in a vicinity of a given side edge thereof between an opened position and a closed position with respect to said lower housing;

a cap section for covering said ink discharge section of said ink jet head;

pressing means for pressing said ink jet cartridge to securely seal said ink discharge section with said cap section;

pump means connected to said cap section and configured to apply a negative pressure to said ink jet discharge section to clear ink therefrom, said pump means being connected to said upper housing and generating the negative pressure by utilising reciprocable movement of said upper housing between the opened position and the closed position; and

an ink storing section connected to said pump means to store ink cleared by said pump means.

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

Name and Address of Applicant: Canon Kabushiki Kaisha
30-2, 3-chome, Shimomaruko
Ohta-ku
Tokyo
JAPAN

Actual Inventor(s): Tsutomu Kawai, Akira Miyakawa, Hideki Yamaguchi, Hitoshi Nakamura and Hisashi Morioka

Address for Service: Spruson & Ferguson, Patent Attorneys
Level 33 St Martins Tower, 31 Market Street
Sydney, New South Wales, 2000, Australia

Invention Title: Storage Container

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

STORAGE CONTAINER

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a storage container to house and store an ink jet cartridge when it is not in use. Such a cartridge is attachable to or detachable from a recording apparatus which performs a desired recording by discharging ink from a discharge port.

Related Background Art

For an ink jet recording apparatus which performs a desired recording by discharging ink from its recording head, there are roughly modes wherein a recording head and an ink tank containing ink to be discharged from the recording head are provided separately to replace the ink tanks when the ink is exhausted, and a cartridge type comprising a recording head and an ink tank integrally, which is structured to be replaceable with respect to an apparatus.

The recording head of a cartridge form is housed for storage in such a manner that a sealing is given to the discharge port portion of the recording head and further, the seal for the discharge port portion is pressed by a cap, that is, in a mode of the so-called blister pack housing container, when the cartridge is distributed as disclosed in Japanese Patent Application Laid-Open No. 3-101944, Japanese Patent Application

Laid-Open No. 3-101945, Japanese Patent Application Laid-Open No. 3-176156, and Japanese Patent Application Laid-Open No. 3-234659, for example.

Now, it for some reason the ink jet cartridge should be stored temporarily while it is still in use for recording, it is difficult to utilize the above-mentioned storage container for preserving the cartridge again. In other words, although it is possible to attach a cap even to the cartridge which has been opened once for the use, and store it in the container, it is impossible to arrange an airtight condition for the discharge ports; thus being unable to suppress the evaporation of ink from the discharge port portion, leading to a possibility that the discharge ports are clogged among other adverse effects.

On the other hand, there are proposed the structures of storage containers dedicated for storing a cartridge of the kind such as disclosed in Japanese Patent Application Laid-Open No. 61-93264, and others. The proposed structures are such that a cover is provided to make the inner space of the container a substantially airtight while the material of an extremely low permeability is used to form the container in order to suppress the evaporation of ink.

Nevertheless, there is still a possibility that ink is evaporated until the component in the inner

airtight space becomes the same as the component of the ink, that is, until an equilibrium state is reached, or a possibility that the ink begins leaking from the discharge ports due to changes in surrounding environment. It is also difficult to secure the airtightness sufficiently; hence causing the discharge ports to be clogged in some cases. The reliability is not good enough.

SUMMARY OF THE INVENTION

It is an object of the present invention to solve the foregoing technical problems and provide a storage container capable of performing a highly reliable storage of an ink jet cartridge which is still in use.

The inventor hereof et al. have acquired a knowledge after assiduous discussions and experiments for the achievement of the aforesaid object that at least a cap and absorbing member should be provided for a storage container to secure an airtightness in it which is higher than that of the discharge ports in order to suppress the ink evaporation, at the same time retaining in the absorbing member any ink that may leak due to changes in the surrounding environment; hence maintaining the wetting state in the cap to prevent the discharge ports from being clogged, and attain a highly reliable storage of the cartridge.

Further, it is known that even the clogged discharge ports can be recovered by an ink exhaust

operation with the provision of a so-called recovery mechanism wherein a pump is connected to a cap to perform the ink exhaust from the discharge ports. With the knowledges thus acquired, a storage container having a higher reliability can be provided.

The present invention is designed on the basis of these knowledges and experiments, and there are disclosed the following for a storage container to house and store an ink jet cartridge structured to be replaceable with respect to a recording apparatus, which comprises a recording head to discharge ink, and an ink tank to contain ink to be supplied to the aforesaid recording head according to the present invention:

a capping member to cover the ink discharge port surface by contacting with the ink discharge port surface of the aforesaid recording head portion; and

an absorbing member conductively connected to the aforesaid capping member to absorb any ink leaking from the aforesaid discharge port surfaces.

According to this invention there is provided a container for containing an ink jet cartridge exchangeably mountable on an ink jet apparatus having an ink jet head provided with an ink discharge section for discharging an ink and an ink tank for storing the ink to be supplied to said ink jet head, said container comprising:

a lower housing for accommodating said ink jet cartridge;

an upper housing for covering said lower housing, said upper housing being reciprocable about a pivot point in a vicinity of a given side edge thereof between an opened position and a closed position with respect to said lower housing;

a cap section for covering said ink discharge section of said ink jet head;

pressing means for pressing said ink jet cartridge to securely seal said ink discharge section with said cap section;

pump means connected to said cap section and configured to apply a negative pressure to said ink jet discharge section to clear ink therefrom, said pump means being connected to said upper housing and generating the negative pressure by utilising reciprocable movement of said upper housing between the opened position and the closed position; and

an ink storing section connected to said pump means to store ink cleared by said pump means.

Further, the storage container is provided with pumping means conductively connected to the capping member to generate pressure to cause ink to be exhausted from the aforesaid recording head, and the exhausted ink from the recording head is retained in the aforesaid absorbing member.

Since at least a cap and an absorbing member are

provided according to the present invention, it is possible to secure an airtightness higher than that of the discharge ports and suppress the ink evaporation from the discharge ports. Also, with the absorbing member, it is possible to retain any ink that may leak due to changes in the surrounding environment. In this way, a wetting state is maintained in the space formed by the discharge port formation surface and the capping member thereby to make it difficult to create any resultant clogging of the discharge ports. Also, with the provision of a recovery mechanism, it is possible to remove such clogging particles by causing ink to be exhausted from the discharge ports even if there should be any discharge port which has been clogged.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a cross sectional view schematically showing the structure of a storage container provided with a cap and an absorbing member according to the present invention.

Fig. 2 is a cross sectional view schematically showing the structure of a storage container provided with a cap, an absorbing member, and a pump mechanism according to the present invention.

Fig. 3 is a cross sectional view schematically showing the outer appearance of a storage container according to an embodiment of the present invention.

Fig. 4 is a perspective view schematically

illustrating the outer appearance of a storage container according to an embodiment of the present invention.

Fig. 5 is a schematic view partially showing one structural example of the coupling state of a storage container according to the present invention.

Fig. 6 is a view schematically showing another embodiment of the storage container according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, with reference to the accompanying drawings, the description will be made in detail of the specific embodiments according to the present invention.

Fig. 4 is a perspective view schematically illustrating the outer appearance of a storage container according to an embodiment of the present invention. Also, Fig. 1 is a cross sectional view schematically showing the structure of storage container according to an embodiment of the present invention.

As shown in Fig. 4, a storage container comprises a storing unit in which an ink cartridge 1 is arranged for storage; a lower housing 2 having an opening through which the ink cartridge is stored or withdrawn; and an upper housing 3 which serves as a covering member to cover the opening and to open or close it

when the ink cartridge is stored or withdrawn. The upper housing 3 is arranged to pivot on a hinge pin 12 with respect to the lower housing 2 for the storage and withdrawal of the ink cartridge 1.

Further as shown in Fig. 1, the storage container is arranged so that the cap 4 which covers the ink discharge port surface is positioned to face the ink jet cartridge 1 when it is installed at one end side of the lower housing 2 of the container. Thus, it is possible to suppress the unfavorable ink evaporation from the discharge ports by creating an airtight space with the cap 4 which covers the ink discharge port surface. In this respect, the ink jet cartridge is pressed by a spring member 2A which will be described later from its rear side in order to cause the ink discharge port surface to be pressed against the cap 4 for the formation of a highly precise airtight space by the use of the ink discharge port surface and the cap 4. Furthermore, it is preferable to form the cap 4 with a resilient material such as rubber to make the airtightness securer.

Also, behind the cap 4, a first absorbing member 6 and a second absorbing member 9 are provided. These absorbing members 6 and 9 are arranged to absorb any ink to begin leaking due to changes in the surrounding environment from the ink discharge ports tightly closed by the cap 4. Particularly, the first absorbing member 6 has a capability

to keep the airtight space in a wetting state by the leaking ink and is able to prevent the ink discharge ports to be clogged effectively and desirably.

As described earlier, in the lower housing 2 of the storage container, a spring member 2A is provided to generate a compression to press the cap 4 against the discharge port surface of the ink jet cartridge 1. This spring member 2A is a flat spring integrally formed with the lower housing 2 with an inclined upper surface having a slope toward the bottom of the lower housing 2 in order to smooth the installation of the ink jet cartridge 1 in the container.

On the other hand, on a part of the upper housing 3 of the storage container, a spring member 3A is integrally formed with the upper housing 3, and when the upper housing 3 is closed, the ink jet cartridge 1 is pressed thereby from the above toward the bottom of the lower housing 2. These spring members 2A and 3A are formed with the respective housings 2 and 3; hence enabling the number of parts to be reduced for the implementation of the cost reduction and easier fabrication.

Also, in the lower housing 2, there are provided ribs 2B on the bottom and side face to be in contact with the bottom and side face of the cartridge 1 and also, a rib 2C in the vicinity of the side face where the cap 4 is arranged to be in contact with a part of

the front end of the recording head, respectively. These ribs 2B and 2C are arranged to position the ink jet cartridge 1 for storage in the container and make it possible to enhance the precision with which to position the cartridge 1 in cooperation with the foregoing spring members 2A and 3A which press the cartridge. Thus, the protective condition of the ink discharge ports by the cap 4 becomes more reliable.

Now, Fig. 2 illustrates a storage container in which a structure is adopted to remove the clogging particles of the discharge ports by providing a pumping means capable of performing a recovery operation positively in addition to the protection given to the discharge ports by the mode wherein the cap 4 and absorbing members 6 and 9 are provided in the storage container as described above.

As clear from Fig. 2, a pumping mechanism is arranged between the cap 4 and the second absorbing member 9 to suck ink from the ink discharge ports in addition to the structure shown in Fig. 1. The pumping mechanism mainly comprises a cylinder 5, a piston 10, and a piston rod 7. The pumping mechanism is conductively connected through the passage provided with the cap 4 and the first absorbing member 6, and further, the ink which is sucked by the pumping mechanism is collected to the second absorbing member 9 which is conductively connected to the pumping mechanism. The piston rod 7 which causes

the piston 10 to be vertically moved is coupled to the upper housing 3 constituting the storage container, and an arrangement is made to actuate the pump to operate by the opening and closing operation of the upper housing 3.

The pumping operation is performed as given below. In other words, with the releasing operation of the upper housing 3, the piston 10 at the lower dead point in the cylinder 5 is shifted upward by the piston rod 7 (the upper face of the piston rod 7 being closely in contact with the bottom end of the piston 10), and the pump chamber A formed between the cylinder 5 and the piston rod 7 is expanded with its pressure being reduced. When the piston 10 is positioned at the upper dead point after passing the passage provided with the first absorbing member which conductively connects the pumping mechanism and the cap 4, the ink discharge port portion of the ink jet cartridge is in a state of a reduced pressure so that ink is forcibly exhausted from the discharge ports by suction. Then, the exhausted ink flows into the pumping chamber A passing through the passage. Subsequently, the piston 10 at the upper dead point is shifted downward by the closing operation of the upper housing 3 to the upper face of the piston rod 7 and the bottom end of the piston 10 which have been in a close contact are now parted. Thus, the ink in the pumping chamber A flows into the upper portion of

the piston 10 through a groove formed in the piston rod 7. The ink is absorbed and retained in the second absorbing member 9 which is conductively connected to the pumping mechanism along an arrow mark in Fig. 2.

In this respect, the first absorbing member 6 arranged in the connecting passage between the cap 4 and the pumping mechanism has an effect to prevent the sucked ink from being returned again by the shift of the piston 10 into the cap 4 which is closely in contact with the discharge ports.

Fig. 3 is a view schematically showing a storage container in which another structural example of the pumping mechanism is installed. This pumping mechanism is such that an opening is provided at the bottom of a cylinder 5 with a check valve 10 which closes or opens the aforesaid opening in synchronism with the shift of a piston rod 7. An O ring is provided for the piston rod 7 to secure the airtightness for the cylinder 5. The foregoing check valve 10 is structured with rubber or some other material in the present embodiment. The structure of the pumping mechanism shown in Fig. 3 enables the piston rod 7 positioned at the lower dead point in the cylinder 5 fixed to an upper housing 3 to be shifted upward by the releasing operation of the upper housing 3. Thus, the check valve 10 at the bottom of the cylinder 5 closes the cylinder opening, and a pumping chamber A formed between the bottom end of the

piston rod 7 and the cylinder 5 is expanded with its pressure being reduced. When the piston rod 7 is positioned at the upper dead point after passing the passage where a first absorbing member conductively connected to the cap 4 is provided, the ink discharge port portion of the ink jet cartridge is in a state of the reduced pressure so that ink is forcibly exhausted from the discharge port by suction. Then, the sucked ink is caused to flow into the pumping chamber A through the passage. Subsequently, when the piston rod 7 at the upper dead point is shifted downward by the closing operation of the upper housing 3, the check valve 10 which has been closely in contact with the bottom opening of the cylinder 5 is parted from the bottom face of the cylinder 5. The ink in the pumping chamber A flows therefrom to be absorbed and retained by the second absorbing member 9 which is conductively connected to the pumping mechanism along an arrow mark in Fig. 3.

The aforesaid second absorbing member 9 has a capacity to absorb the total quantity of ink contained in the ink jet cartridge. The present embodiment includes an absorbing member 9 capable of collecting ink of approximately 25 cc. This is a resultant volume worked out by a calculation with an effective efficiency of 70% in order to prevent any leakage of the absorbed ink due to changes in the surrounding environment. The maximum storable quantity of the exhausted ink by the absorbing

member 9 is approximately 35 cc.

Now, for the structure in which the piston rod 7 fixed to the upper housing 3 is operated by the utilization of the opening and closing operation of the upper housing 3 as in the above-mentioned pumping mechanism of the storage container, there is a need for regulating the range within which the upper housing 3 should be opened or closed. In other words, without any measure to regulate such a range, the releasing state of the upper housing 3 is assumed to be regulated by the stroke of the pump at the upper dead point. Therefore, the load given to the pump becomes too great, and if any great force is exerted unnecessarily on the upper housing 3, there is a possibility that the pumping mechanism is destroyed.

Therefore, according to the present embodiment, a regulating member 13 is provided between the upper housing 3 and the lower housing 2 of the storage container as shown in Fig. 4. This regulating member 13 comprises a board provided with an opening configured along the locus of the open and close operation of the upper housing 3, and a pin provided on the lower housing 2 side which engages with this opening. Then, the board member is fixed to the upper housing 3 at one end with the opening being arranged to engage with the pin. The releasing position of the upper housing 3 is regulated by the engagement between

the one end of the pin and the opening of the board member so as to restrict any further releasing operation. With this positional regulation implemented by the dedicated regulating member 13 for the upper housing 3, it is possible to protect the pumping mechanism from any damage assuredly even when any power is given to releasing the upper housing 3 more than required. It is also possible to drive the pumping mechanism reliably. Here, it is preferable to use a metal or the like as a material to form the board member because of the sufficient strength needed.

In this respect, the structure of the regulating member 13 is not necessarily confined to the one shown in Fig. 4. For example, it may be possible to adopt a structure thereby to arrange a slope 3a as shown in Fig. 2 on the leading end side of the hinge 12 serving as the center of the opening and closing operation of the upper housing 3 which is fixed thereto, and then, to regulate the releasing angle of the upper housing 3 in cooperation with the wall face 8a of the lower housing 2 side which is in the position opposite to the slope thus arranged. Nevertheless, from the viewpoint of the reliability, it is more preferable to provide the regulating member 13.

Now, the ink jet cartridge to be stored in the storage container requires an attention given to its storing mode because it contains a liquid ink therein.

In other words, if the recording head portion of the cartridge should be held upward in relation to the gravitational direction for storage, there is a possibility that ink returns from the recording head portion to the tank side. If ink is thus removed from the recording head portion, the recovery operation should be repeated more than a given time when the cartridge is used for the next recording; hence making it difficult to maintain the reliability in storage.

Therefore, according to the present embodiment, the cartridge receiving side of the storage container is curved in its configuration as at 3B in order to make it difficult to hold the recording head portion upward in relation to the gravitational direction. In this way, it is possible to avoid the foregoing problem simply because the recording head portion can hardly be positioned upward when stored in the container. This means that it will suffice if only the storage container is prevented from being laid down with its side end downward by providing a slope or the like on the side face of the container opposite to the position where the recording head should not be placed when stored.

The aforesaid storage container can be preferably used as a provisional storage container for an ink cartridge still in use when another ink jet cartridge should be used among some other cases.

A recording mode of the kind can be preferably utilized for performing a color recording with an apparatus provided with one carriage on which one ink jet cartridge is mountable, for example. In other words, if an image should desirably be formed emphatically in red ink by the use of an apparatus wherein recordings are performed by an ink cartridge which usually contains black ink, the objective recording should be executed by exchanging a red ink cartridge and a black ink cartridge as required. Then, after the termination of such a recording, the red ink cartridge which is still usable can be kept in storage by the foregoing storage container in a highly reliable condition.

Also, if a recording should be performed by exchanging more numbers of different ink cartridges with each other, a plurality of storage containers matching the number of cartridges are required. (Usually, a black ink cartridge is most often used, and when such a recording is terminated, the black ink cartridge remains to be installed on the apparatus in most cases. Then, at least a corresponding number of storage containers for the remaining color ink cartridges are needed). When a plurality of storage containers are required in a case such as this, it is preferable to make such numbers of storage containers available for each color together rather than

individually. Here, as shown in Fig. 4, a rail member 2a and a rail member receptacle 2b are arranged on the side faces of the storage container, and by connecting them, plural storage containers can be put together desirably. According to the present embodiment, the rail member 2a and rail member receptacle 2b are of the so-called slit tail configuration to fit them each other as shown in Fig. 5, and are arranged to slidably engage with each other to form its integration or separation.

Furthermore, Fig. 6 is a view schematically showing a storage container which is provided with a stopper as a regulating member 13. A storage container of a type where a suction recovery mechanism is provided for an ink jet cartridge is arranged to perform its recovery operation by the opening and closing operation of the upper housing. Therefore, any unnecessary opening and closing operation of the upper housing leads to a wasteful consumption of ink. To counteract this, a stopper 13a is provided as the regulating member 13 as shown in Fig. 6 so that the upper housing can be fixed at its maximum releasing position. Thus, there is no possibility that the upper housing will be closed by its own weight and the like; making it possible to prevent any unnecessary opening and closing operation when the cartridge is removed. Also, with this arrangement, it becomes easier to remove the

cartridge.

Now, the material used for a storage container of the kind should preferably be a material which is strong enough but easy to be machined. To name some, plastic, ABS and the like are a preferable material. Moreover, using a transparent or semitransparent material for the storage container, it is possible to ascertain whether any cartridge is in the container or not; hence preventing any unnecessary opening and closing operation. Also, in this way, the ink retained in the second absorbing member 9 is visible. If, therefore, a number of color ink storage containers are employed, it is possible to confirm each individual ink color and prevent any color mixture for the head. Further, the quantity of absorbed ink in the second absorbing member 9 is also recognizable. Hence, the absolute quantity of absorption of the ink absorbing member can be grasped. Therefore, if the second absorbing member 9 is arranged to be a three-layer structure at 9a to 9c, for example, it is possible to grasp more clearly the absolute quantity of absorption of the ink absorbing member because ink is being absorbed by each absorbing member of the layers in that order.

In this respect, according to Fig. 6, in addition to the first absorbing member and second absorbing members 9a to 9c, a third absorbing member 14 is provided in the circumference of the cap 4. This third absorbing member is exactly of an L-letter shape, and is installed on the lower side

and left-hand side of the cap 4 in order to prevent the inside of the storage container from being stained if any counterflow of ink should occur by some reason. A reference numeral 15 designates an air conduit opening provided for the purpose of adjusting the pump pressure appropriately.

It is preferable to use a storage container of the kind for storing the color ink cartridge which is not in use frequently as described above. Accordingly, it is preferable to adopt a mode wherein the storage container for the cartridge and color ink cartridge are packed in one package when sold on a market. Then, a mode is still adopted so that the cartridge is collected together with the storage container when the ink in the cartridge is totally consumed. It is thus possible to eliminate any possibility to stain the surrounding environment by the leakage of slightly remaining ink in the cartridge in the process of collection of the used cartridge.

As described above, according to the present invention, there are provided at least a cap and absorbing member to secure an airtightness higher than that of the discharge ports; hence making it possible to suppress the ink evaporation from the discharge ports. Also, with the absorbing member, it is possible to retain the ink which leaks due to changes in the surrounding environment and thus, keep the inside of a space formed

by the cap and the discharge port formation surface to be in a wetting condition thereby to eliminate a possibility that the discharge ports are clogged. In addition, with the provision of a recovery mechanism, it is possible to remove the clogging particles by causing ink to be exhausted from the discharge ports even if there occur some discharge ports which are clogged.

It is, therefore, possible to provide a storage container capable of storing with a high reliability an ink jet cartridge which is still in use.

The claims defining the invention are as follows:-

1. A container for containing an ink jet cartridge exchangeably mountable on an ink jet apparatus having an ink jet head provided with an ink discharge section for discharging an ink and an ink tank for storing the ink to be supplied to said ink jet head, said container comprising:

a lower housing for accommodating said ink jet cartridge;

an upper housing for covering said lower housing, said upper housing being reciprocable about a pivot point in a vicinity of a given side edge thereof between an opened position and a closed position with respect to said lower housing;

a cap section for covering said ink discharge section of said ink jet head;

pressing means for pressing said ink jet cartridge to securely seal said ink discharge section with said cap section;

pump means connected to said cap section and configured to apply a negative pressure to said ink jet discharge section to clear ink therefrom, said pump means being connected to said upper housing and generating the negative pressure by utilising reciprocable movement of said upper housing between the opened position and the closed position; and

an ink storing section connected to said pump means to store ink cleared by said pump means.

2. A storage container according to claim 1, wherein:

said storage container further comprises an opening to store or withdraw said recording head, a housing having a portion to house said recording head, and a capping member to cover said opening of said housing, and a spring member is provided in said housing to press said stored recording head so that said ink discharge section is pressed to be in contact with said capping member.

3. A storage container according to claim 2, wherein:

said spring member is structured with a resilient flat spring separately fixed to said housing.

4. A storage container according to claim 2 or 3, wherein:

the covering member of said storage container is provided with a spring member integrally or separately formed therewith to press said stored ink jet cartridge to the bottom of said housing.

5. A storage container according to claim 2, 3 or 4, wherein:

a piston rod constituting said pumping member is coupled to the covering member of said storage container to drive said pumping member in accordance with the opening and closing operation of said covering member to cause ink to be exhausted from said recording head.

6. A container according to any one of the preceding claims, wherein:

said container further comprises elastic keeping means for pressing said ink jet cartridge in said lower housing.

7. A storage container according to any one of the preceding claims, further comprising an absorbing member provided in a part of a connecting passage between said cap and said pump means.

8. A container according to any one of the preceding claims, wherein:

an opening angle of said upper housing is determined by a sloped surface extending from said pivot point to the given side edge of said upper housing.

9. A storage container according to any one of the preceding claims, further comprising an inclined portion which is provided in said container for a part of the housing constituting said container so that at least the ink discharge section of said recording head is not positioned upward in a gravitational direction.

10. A storage container according to any one of the preceding claims, having a plurality of side faces, and further comprising engaging means for engaging another container, said engaging means being disposed on at least one of the side faces of said container.

11. A container according to any one of the preceding claims, wherein said ink storing section has an absorbing member for absorbing sucked ink.

12. A container according to any one of the preceding claims, wherein said ink storing section has an atmospheric communicating port for communicating an interior of said ink storing section with the atmospheric air.

13. A container according to any one of the preceding claims, wherein an opening angle by the opening and closing movement of said upper housing is defined by a moving member provided along with said upper and lower housings and a stopper limiting the movement of said moving member.

14. A container for containing an ink jet cartridge, substantially as herein described with reference to the drawings.

DATED this Thirteenth Day of April 1995

Canon Kabushiki Kaisha

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

Storage Container

ABSTRACT

A storage container for housing and storing an ink jet cartridge (1) which has a recording head to discharge ink, and an ink tank to contain ink to be supplied to the recording head and which is structured to be exchangeable with respect to a recording apparatus comprises a capping member (4) to be in contact with the ink discharge port surface of the recording head to cover the surface thereof and absorbing members (6, 9) conductively connected to the capping member (4) to absorb ink which leaks from said recording head. With the capping member (4) and absorbing member (6, 9), an airtightness higher than that of the discharge ports is secured to suppress the ink evaporation from the discharge ports of the recording head while the cartridge (1) which is still in use is kept in the storage container.

Figure 1.

FIG. 1

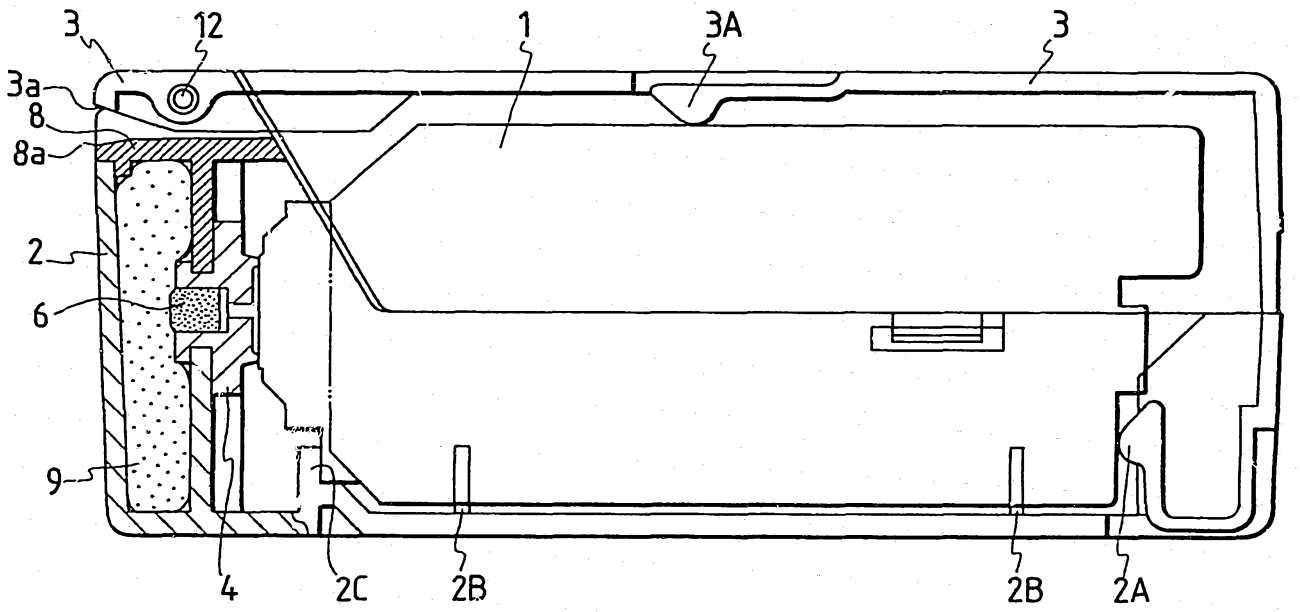

FIG. 2

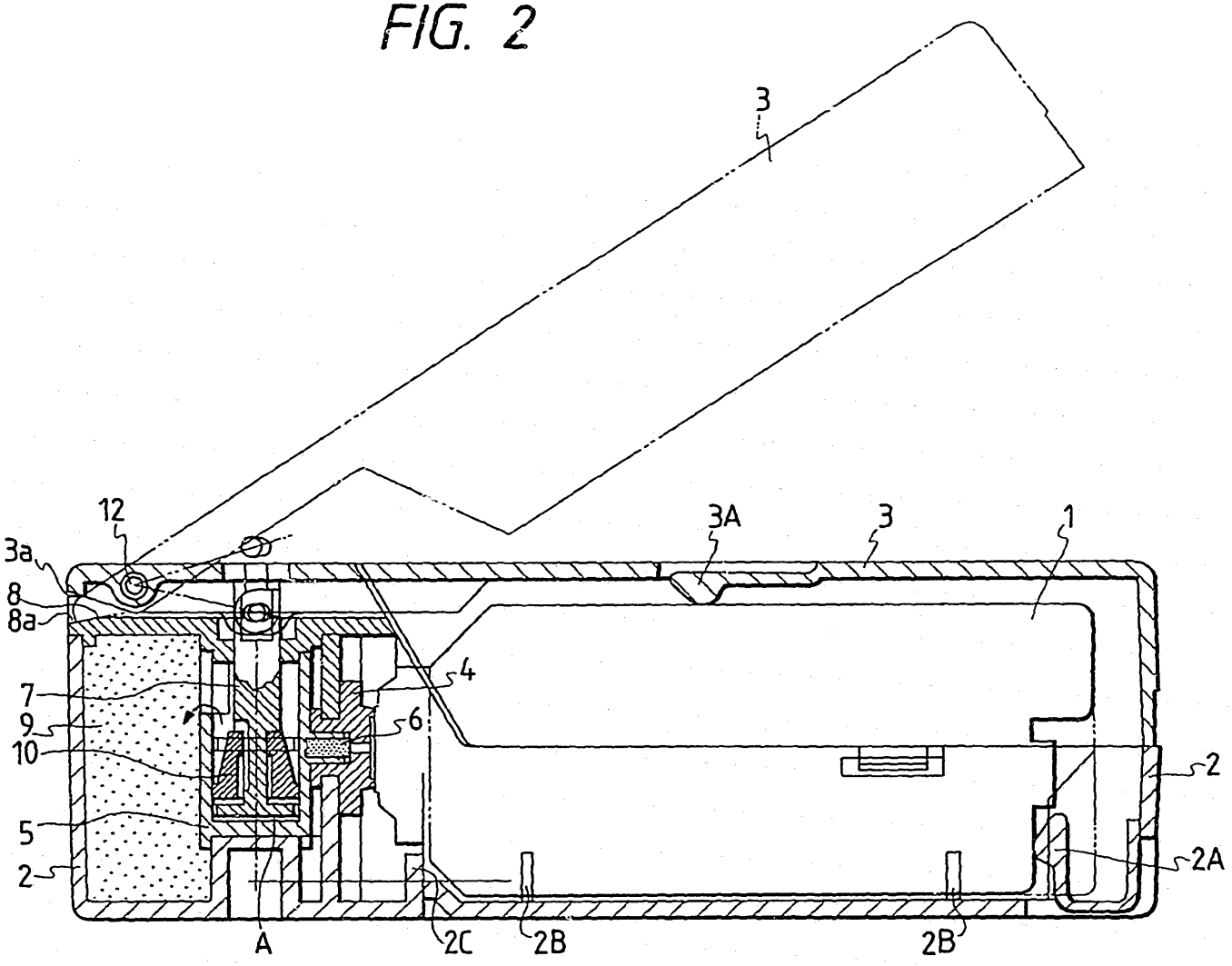

FIG. 3

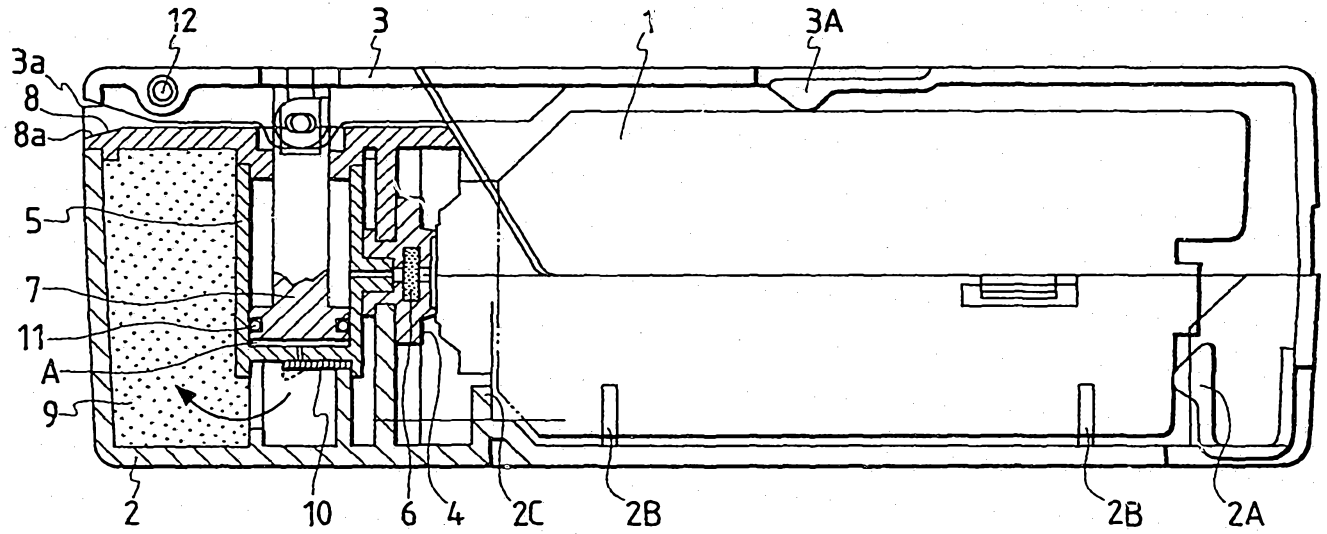

FIG. 4

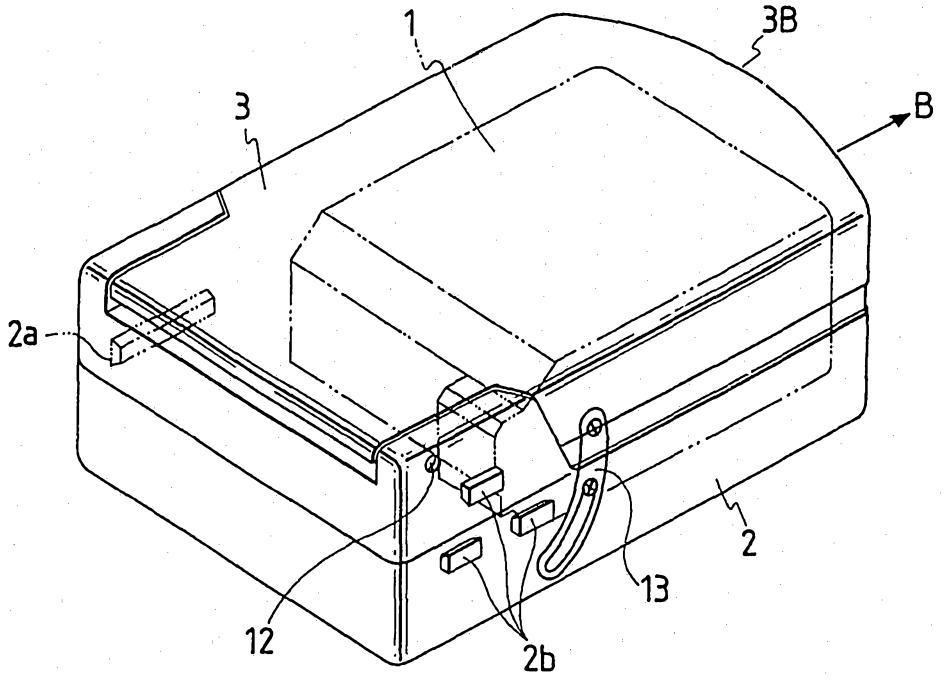

FIG. 5

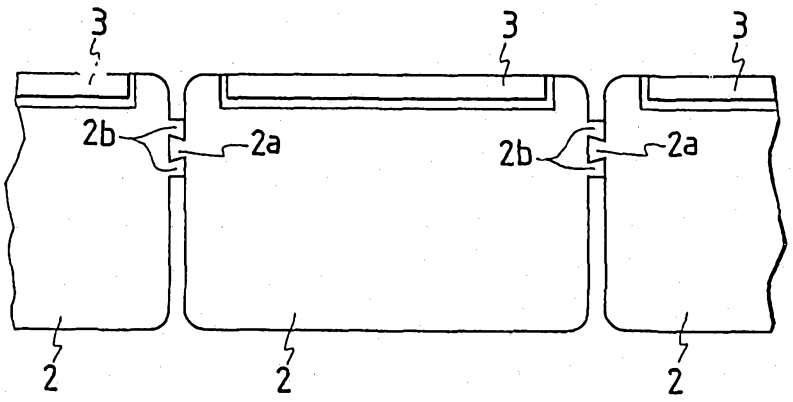

FIG. 6