

SPECIFICATION

TITLE OF THE INVENTION

COOLING STORAGE

5 BACKGROUND OF THE INVENTION

The present invention relates to a cooling storage in which a cooling unit constituted of a compressor and a cooler is assembled under an insulation box member including a storage chamber constituted in the insulation
10 box member.

In this type of cooling storage which has heretofore been used as a low-temperature showcase, a mechanical chamber is constituted under a storage chamber constituted in an insulation box member, and a bottom wall of the
15 insulation box member is provided with a cold air discharge port and a cold air suction port which communicate with the inside of the mechanical chamber. In the mechanical chamber, a cooling box having an opening in an upper surface of the cooling box is allowed to abut on the bottom
20 wall of the insulation box member. Moreover, in this cooling box, a cooler and a blower for the cooler constituting a cooling unit are arranged. Moreover, the storage chamber communicates with the cooling box via the cold air suction port and the cold air discharge port.

25 Under the cooling box of the mechanical chamber, a compressor, a condenser, a blower for the condenser and the like constituting the cooling unit together with the cooler

are arranged on a mounting base including casters for movement on a bottom surface of the mounting base. In consequence, a well-known refrigerant circuit is constituted.

5 Moreover, the cooling box is disposed above the mounting base, and detachably attached to the bottom wall of the insulation box member. The cooling box, the cooler, the blower for the cooler, the compressor, the condenser and the like can detachably be inserted together with the
10 mounting base into the mechanical chamber by use of the casters, and the cooling unit can be separated from the insulation box member (see, e.g., Japanese Patent Application Laid-Open No. 2000-105058).

 However, in the above conventional constitution, the
15 cold air leaks from gaps between the upper-surface opening of the cooling box and the cold air discharge port and cold air suction port. Therefore, after storing the mounting base in the mechanical chamber, the cooling box provided with the cooler and the blower for the cooler has to be
20 lifted up and fixed to the bottom wall of the insulation box member via a fixing member and the like. Therefore, there is a problem that an attaching operation of the cooling unit becomes complicated.

 Moreover, at this time, the cooling box has to be
25 fixed to positions corresponding to the cold air suction port and the cold air discharge port formed in the bottom wall of the insulation box member. There has been a

problem that it is difficult to position the cooling box, and an operability further deteriorates. It is also considered that the mounting base to which the cooling box is fixed is lifted up and fixed to the bottom wall of the insulation box member. However, as described above, devices other than the cooling box, that is, the compressor, the condenser and the like are arranged on the mounting base. Therefore, the gross weight sometimes exceeds 40 kg. It is very laborious to perform the lifting operation every time a maintenance operation is performed. It has been demanded that the operation be simplified.

Embodiments of the present invention seek to overcome or ameliorate one or more of the disadvantages of the prior art, or at least to provide a useful alternative.

Embodiments of the present invention also seek to provide a cooling storage in which a cooling unit can easily be positioned and pushed up when attached and in which strength of a constitution for pushing up the unit can be provided.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided a cooling storage comprising:

- a storage chamber;
- a mechanical chamber located under the storage chamber;
- an insulation box member surrounding the storage chamber, a bottom wall of the insulation box member defining a ceiling of the mechanical chamber;
- a cooling unit to be inserted in the mechanical chamber, said cooling unit comprising:

a cooler and a blower stored in a cooling chamber defined by a cooling box said cooling chamber having a discharge side and a suction side; and

a compressor;

said cooler, blower and compressor being integrally arranged on a mounting base;

a cold air discharge port and a cold air suction port formed in the bottom wall of the insulation box member to connect the inside of the storage chamber to the inside of the mechanical chamber;

positioning means for positioning the cooling unit in the mechanical chamber so that said discharge side and said suction side of the cooling chamber are arranged, respectively, under said cold air discharge port and said cold air suction port;

a push-up member, defined by a bent steel rod of circular cross-section, for abutting on opposite sides of a lower surface of the mounting base, or on distal and proximal sides of the lower surface of the mounting base, with respect to an insertion direction of the cooling unit into the mechanical chamber, said push-up member adapted to rotatably push up the cooling unit toward the bottom wall of the insulation box member.

Preferably, an arm portion which rotates the push-up member is bent and formed integrally with the push-up member.

Preferably, the push-up member pushes down the arm portion from a raised state of the arm portion toward the mounting base to rotate and push up the mounting base, the arm portion can be fixed to the mounting base in a state in which the arm portion is pushed down, and a tip end of the arm portion is bent away from the mounting base.

According to an embodiment of the invention, the cooling storage includes the mechanical chamber constituted under the storage chamber constituted in the insulation box member. The cooling storage includes the cooling unit in which the cooler and the blower stored in the cooling chamber constituted in the cooling box, the compressor and the like are integrally arranged on the mounting base; the cold air discharge port and the cold air suction port which are formed in the bottom wall of the insulation box member constituting the ceiling of the mechanical chamber and which connects the inside of the storage chamber to the inside of the mechanical chamber; the positioning means for positioning the cooling unit in the mechanical chamber so that the discharge side and the suction side of the cooling chamber are arranged under the cold air discharge port and the cold air suction port, respectively; and the push-up

member which abuts on the lower surface of the mounting base on the opposite sides or the lower surface of the mounting base on the distal side and the proximal side with respect to such a direction as to insert the cooling unit
5 into the mechanical chamber and which rotatably pushes up the cooling unit toward the bottom wall of the insulation box member. Therefore, the push-up member can push up the cooling unit toward the insulation box member to press the cooling box onto the bottom wall of the insulation box
10 member.

In consequence, the cooling unit integrated with the compressor, the cooling box and the like can be attached to the bottom wall of the insulation box member without any trouble, and the cold air circulation can be constituted so
15 that the cold air subjected to the heat exchange between the cold air and the cooler is discharged into the storage chamber from the cold air discharge port by the blower and sucked into the cooling chamber from the cold air suction port to cool the inside of the storage chamber.

20 Especially, since the push-up member abuts on the lower surface of the mounting base of the cooling unit to push up the cooling unit, any push-up structure does not have to be especially constituted on the side of the cooling unit, cost can be reduced, and versatility is
25 enlarged. Since the push-up member is constituted by bending the steel rod having the circular section, the push-up member can be brought into point contact with the

lower surface of the mounting base, and resistance is reduced. In consequence, the push-up member can easily be rotated, and attaching operability of the cooling unit is improved. Since the present invention includes the positioning means, a position where the cooling unit is attached can be determined during the inserting of the cooling unit into the mechanical chamber, and an attaching operation of the cooling unit can be facilitated.

According to a preferred embodiment, the arm portion which rotates the push-up member is bent and formed integrally with the push-up member. Therefore, a rotating operation of the push-up member can easily be performed. Especially, as compared with a case where the member is constituted of a large number of components and an operation support is a screw as in a conventional example, strength can be improved, and the number of the components may be reduced.

According to a preferred embodiment, the push-up member pushes down the arm portion from the raised state of the arm portion toward the mounting base to rotate and push up the mounting base, the arm portion can be fixed to the mounting base in a state in which the arm portion is pushed down, and the tip end of the arm portion is bent away from the mounting base. Therefore, even in a case where the arm portion is gripped to perform the rotating operation, a disadvantage that the mounting base is manually touched can be avoided, and the operability may be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will be described hereinafter, by way of example only, with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a cooling storage to which a preferred embodiment of the present invention is applied;

FIG. 2 is a vertical side view of the cooling storage of FIG. 1;

FIG. 3 is an enlarged vertical side view of a lower part of FIG. 2;

FIG. 4 is a perspective view of a cooling unit and a push-up mechanism;

FIG. 5 is an exploded perspective view of the push-up mechanism;

FIG. 6 is a partially exploded perspective view of the push-up mechanism;

FIG. 7 is a partially enlarged front view of a state in which the push-up mechanism is lowered;

FIG. 8 is a partially enlarged front view of a state in which the push-up mechanism is pushed up;

FIG. 9 is a diagram showing a rotary state of a push-up member;

FIG. 10 is a perspective view of a state before the cooling unit is inserted into the push-up mechanism;

FIG. 11 is a perspective view of a state in which the cooling unit is inserted into the push-up mechanism (a state before the cooling unit is pushed up);

5 FIG. 12 is a perspective view of a state in which

the cooling unit is pushed up by the push-up mechanism; and

FIG. 13 is a partially enlarged sectional view of the state of FIG. 12.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

 A cooling storage 1 according to an embodiment of the present invention will hereinafter be described in detail with reference to the drawings. FIG. 1 is a perspective view of the cooling storage 1 to which the present invention is applied; FIG. 2 is a vertical side view similarly showing the cooling storage 1; and FIG. 3 is an enlarged vertical side view of a lower part of FIG. 2.

 In the cooling storage 1 of the present embodiment, a main body is constituted of a rectangular insulation box member 2 having an open front surface. This insulation box member 2 is constituted of an outer box 3 having an opening in a front surface thereof and formed of a steel plate, an inner box 4 having an opening in a front surface thereof and an insulation material 5 foamed and filled between the outer box 3 and the inner box 4. Moreover, in the insulation box member 2, a storage chamber 6 having an opening in a front surface is formed, and the opening of the front surface of the storage chamber 6 is openably closed by a door 8 including a glass 7 through which the inside of the chamber can be seen. The door 8 is an openable door having one end rotatably supported by a side part of the insulation box member 2. Moreover, the storage

chamber 6 is provided with a plurality of stages of shelves 11 ... on which foods and the like are mounted.

A base leg angle 12 having a predetermined height is attached to a bottom surface of the insulation box member 2, and opposite side surfaces of the base leg angle 12 and opposite side surfaces of the insulation box member 2 are covered with face panels 13. In consequence, a mechanical chamber 21 is formed under the insulation box member 2. It is to be noted that a pair of fixing members 41, 41 described later in detail are attached to lower front and rear sides 12A, 12A of the base leg angle 12 constituting a bottom part of this mechanical chamber 21. A cold air suction port 14 and a cold air discharge port 15 are formed at front and rear portions of a bottom wall 2A of the insulation box member 2, respectively, so as to extend through the insulation material 5.

A cooling box 22 having an opening in an upper surface is disposed so as to abut on a lower surface of the bottom wall 2A of the insulation box member 2, which is a ceiling of the mechanical chamber 21. In this cooling box 22, a cooling chamber 23 is formed, a cooler 24 constituting a cooling device is disposed, and a blower 25 for the cooler is disposed before the cooler 24. It is to be noted that the opening of the upper surface of this cooling box 22 is divided into a cold air suction port 27 and a cold air discharge port 28 on the side of the cooling box 22 by a partition plate 26 as shown in a perspective

view of a cooling unit R in FIG. 4. The cold air suction port 27 and the cold air discharge port 28 correspond to the cold air suction port 14 and the cold air discharge port 15 formed in the bottom wall 2A of the insulation box member 2, respectively. A sealing material 29 (shown in FIG. 3 only) to be closely attached to abut on the lower surface of the bottom wall 2A of the insulation box member 2 is attached to an opening edge of this cooling box 22. It is to be noted that a constitution in which the upper surface of the cooling box 22 is closely attached and fixed to the lower surface of the bottom wall 2A of the insulation box member 2 will be described later in detail.

On the other hand, a partition plate 31 is attached to an inner part of a back wall 2B of the insulation box member 2 so as to constitute a duct 30 which communicates with the cold air discharge port 15 formed in the bottom wall 2A and an upper part of the storage chamber 6. This partition plate 31 is provided with a plurality of openings (not shown) which supply cold air discharged from the blower 25 for the cooler. In consequence, the cold air is effectively supplied into the storage chamber 6. It is to be noted that on this partition plate 31, engagement portions to engage with the shelves 11 may be formed beforehand.

On the other hand, in the mechanical chamber 21, a mounting base 32 constituting a bottom part of the cooling unit R is stored. Moreover, on this mounting base 32, a

compressor 33, a condenser 34 and a blower 35 for the condenser constituting the cooling device together with the cooler 24, a control box 39 and the like are arranged.

5 Casters 32A are attached to four corners of this mounting base 32. It is to be noted that the casters 32A are shown in FIGS. 2 and 3 only. An openable/closable panel 36 is attached to a front surface of the mechanical chamber 21 to shield the mechanical chamber 21. It is to be noted that this panel 36 is provided with a plurality of ventilation
10 holes 37 which face a front part of the condenser 34.

Here, the cooler 24 of the cooling box 22 is connected to the compressor 33, the condenser 34 and the like arranged on the mounting base 32 via a refrigerant pipe to constitute a well-known refrigerant circuit. The
15 cooling box 22 is detachably held by cooling box support members 38 ... arranged at positions corresponding to four corners of a lower surface of the cooling box 22, respectively. In consequence, the cooling unit R including the cooling box 22, the cooler 24, the blower 25 for the
20 cooler, the compressor 33, the condenser 34 and the like can detachably be inserted together with the mounting base 32 into the mechanical chamber 21, and can be separated from the insulation box member 2.

Next, a push-up structure of the cooling unit R will
25 be described with reference to FIGS. 4 to 13. FIG. 4 is a perspective view of the cooling unit R and a push-up mechanism; FIG. 5 is an exploded perspective view of the

push-up mechanism; FIG. 6 is a partially exploded perspective view of the push-up mechanism; FIG. 7 is a partially enlarged front view of a state in which a push-up member 44 falls; FIG. 8 is a partially enlarged front view of a state in which the push-up member 44 rises; FIG. 9 is a diagram showing a rotary state of the push-up member 44; FIG. 10 is a perspective view of a state before the cooling unit R is inserted into the push-up mechanism; FIG. 11 is a perspective view of a state in which the cooling unit R is inserted into the push-up mechanism (a state before the cooling unit is pushed up); FIG. 12 is a perspective view of a state in which the cooling unit R is pushed up by the push-up mechanism; and FIG. 13 is a partially enlarged sectional view of the state of FIG. 12.

15 The push-up mechanism which pushes up the cooling unit R together with the mounting base 32 toward the bottom wall 2A is constituted of a pair of fixing members 41, 41 and a pair of push-up members 44, 44. When the cooling unit R is stored, the fixing members 41, 41 extend forwards and backwards along opposite side portions of the cooling unit R, that is, from a proximal side to a distal side of the mechanical chamber 21. Each fixing member substantially has an L-shaped section which opens toward the inside of the mechanical chamber 21. A bottom surface 41A of this fixing member 41 is provided with a plurality of engagement holes 41B. The engagement holes 41B are superimposed on engagement holes (not shown) formed

beforehand in the lower front and rear side 12A of the base leg angle 12, and fixed via screws. In consequence, the fixing member 41 is fixed to the base leg angle 12.

Moreover, a rear end of a side surface of this
5 fixing member 41 is provided with a stopper (positioning means) 42 substantially bent at right angles toward the inside of the mechanical chamber 21. A front end of the bottom surface of the fixing member 41 and a side end of the fixing member on the side of the mechanical chamber 21
10 are provided with flanges 43, 47 which are substantially bent upwards at right angles. Moreover, the flange 43 formed at the front end of the fixing member and the stopper 42 formed at the rear end of the fixing member have concave portions 46 which are positioned at end portions
15 butted with the flange 47 formed along the side end of the fixing member and at which the flange 43 and the stopper 42 are not formed. A front portion and an inner portion of the push-up member 44 are stored and held in the concave portions. It is to be noted that the flange 47 is formed
20 to improve strength of the fixing member 41.

The push-up member 44 is formed of a steel rod having a circular section, and extended from a front end to a rear end of the fixing member 41, that is, from a proximal side to a distal side of the mechanical chamber 21.
25 In the present embodiment, the steel rod is bent a plurality of times, that is, twelve times in the present embodiment to thereby constitute straightened rotary shafts

44A at a front side, an inner portion and two middle portions positioned between the front side and the inner portion of the push-up member. Moreover, the push-up member is constituted of three top sides 44B formed by
5 bending each portion between these rotary shafts 44A into a trapezoidal shape having an equal dimension (an equal height) in the same direction. It is to be noted that in the present embodiment, to secure a predetermined strength, a steel rod having a sectional diameter of about 8 mm is
10 used.

Moreover, an end portion of the rotary shaft 44A positioned at the inner portion of this push-up member 44 is stored and held by the concave portion 46 formed between the stopper 42 and the flange 47, and rotatably held by the
15 fixing member 41 via a holding member 45 such as an E-ring.

It is to be noted that, as shown in FIG. 6, a plurality of portions of the bottom surface 41A of the fixing member 41, that is, two portions of the bottom surface shown in the drawing are cut and raised in parallel
20 with the push-up member 44 to form rotary shaft holding portions 41C. In grooves formed by cutting and raising the portions, the rotary shafts 44A corresponding to two middle portions positioned between the front side and the inner portion of the push-up member 44 may be held. It is to be
25 noted that in FIG. 6, the flange 47 is omitted so that the rotary shaft holding portions 41C can visually be recognized. In drawings other than FIG. 6, the rotary

shaft holding portions 41C are omitted.

Moreover, at a front end of this push-up member 44, an arm portion 48 is bent and formed integrally with and continuously from the rotary shaft 44A positioned on the front side of the push-up member. This arm portion 48 is substantially bent at 90 degrees outwards from the front end of the rotary shaft 44A positioned on the front side on a side opposite to a mechanical chamber 21 side, and then an end portion of the arm portion is substantially bent vertically from a plane formed by the rotary shafts 44A and the top sides 44B.

In consequence, in a state in which the rotary shafts 44A and the top sides 44B forming the push-up member 44 come into contact with the bottom surface 41A of the fixing member 41, that is, the top sides 44B fall on the bottom surface 41A of the fixing member 41, the arm portion 48 rises substantially vertically from the bottom surface 41A of the fixing member 41. At this time, it is assumed that, when the mounting base 32 of the cooling unit R is inserted as shown in FIG. 7, the raised arm portion 48 is positioned along the same plane as that of a side surface of the fixing member 41 or slightly outwardly from the side surface of the fixing member so as to avoid the mounting base 32. On the other hand, in a state in which the arm portion 48 is rotated centering on the rotary shaft 44A of the push-up member 44 and pushed down toward the inside of the mechanical chamber 21, that is, brought into a

substantially horizontal state, the top sides 44B of the push-up member 44 are moved to positions having a predetermined height from the bottom surface 41A of the fixing member 41.

5 Furthermore, a tip end of this arm portion 48 is provided with a grip portion 48A bent forwards, that is, in a direction away from the mounting base 32 in a state in which the mounting base 32 of the cooling unit R is mounted on the push-up mechanism. Furthermore, this arm portion 48
10 is provided with a fixing hole 48B to be fixed to a front end of the mounting base 32 of the cooling unit R.

 According to the above constitution, as shown in FIG. 10, the mounting base 32 of the cooling unit R is inserted from a front part of the mechanical chamber 21 as described
15 above. At this time, the mounting base 32 is horizontally positioned by side surfaces of both of the fixing members 41, 41 fixed to the lower front and rear sides 12A, 12A of the base leg angle 12. Moreover, opposite ends of a lower surface of the mounting base 32 are allowed to abut on
20 upper surfaces of the push-up members 44 attached to inner portions of the fixing members 41, and the mounting base is slid inwards until the base abuts on the stoppers 42 formed at the rear ends of the fixing members 41. In consequence, the mounting base is inserted into the mechanical chamber
25 21 as shown in FIG. 11.

 In consequence, the mounting base can correctly be positioned so that the cold air suction port 27 and the

cold air discharge port 28 formed in the cooling box 22 of the cooling unit R are arranged under the cold air suction port 14 and the cold air discharge port 15 formed in the bottom wall 2A of the insulation box member 2. An
5 attaching operation of the cooling unit can be simplified, and leakage of the cold air due to front and rear positional deviations of the fixed mounting base 32 can be suppressed.

Moreover, in a state in which the cold air suction
10 port 27 and the cold air discharge port 28 of the cooling box 22 are arranged under the cold air suction port 14 and the cold air discharge port 15 of the bottom wall 2A of the insulation box member 2, as described above, the grip portions 48A are gripped, and arm portions 48 of the push-
15 up members 44 positioned on opposite sides are pushed down toward the inside of the mechanical chamber 21. In consequence, the push-up members 44 formed integrally with the arm portions 48 are rotated centering on the rotary shafts 44A as described above.

20 Here, as described above, the rotary shafts 44A of the push-up member 44 are linearly constituted, and the top sides 44B are constituted of trapezoidal top sides positioned between the rotary shafts 44A and formed into the equal dimension in the same direction. The push-up
25 member is bent so that these rotary shafts 44A and top sides 44B are alternately formed.

Therefore, when an operation of pushing down the arm

portion 48 toward the inside of the mechanical chamber 21 is performed, the push-up member 44 is rotated centering on each rotary shaft 44A supported by the bottom surface 41A of the fixing member 41. In consequence, the top sides 44B (formed at three portions in the present embodiment) move upwards along a circular track having an equal height centering on the rotary shaft 44A as a radius, that is, a height corresponding to a dimension between the top side 44B and the rotary shaft 44A. In consequence, as shown in FIG. 13, when the top sides 44B of the push-up member 44 brought into contact with the mounting base 32 move, the mounting base 32 is pushed up as much as the dimension between the top side 44B and the rotary shaft 44A. Therefore, the cooling box 22 fixed to the mounting base 32 is also pushed up, and the opening of the upper surface of the cooling box 22 is allowed to abut on the lower surface of the bottom wall 2A of the insulation box member 2.

At this time, in the present embodiment, the three top sides 44B are linearly constituted so as to have the equal height, and the top sides 44B push up and support the cooling unit R. Therefore, a load on the cooling unit R can be scattered to three portions when supported. It is possible to avoid a disadvantage caused by concentration of the load on one portion.

Moreover, the sealing material 29 is attached to the opening edge of the cooling box 22 as described above. Therefore, when the sealing material 29 expands or

contracts, the upper surface of the cooling box 22 including the opening can closely be pressed onto the bottom wall 2A.

Therefore, the cooling unit R integrally constituted
5 of the compressor 33, the condenser 34, the cooling box 22 and the like can be attached to the bottom wall 2A of the insulation box member 2 without any trouble to constitute cold air circulation so that the cold air subjected to heat exchange between the air and the cooler 24 is discharged
10 into the storage chamber 6 from the cold air discharge port 15 by the blower 25 for the cooler and sucked into the cooling chamber 23 from the cold air suction port 14. Therefore, the inside of the storage chamber 6 can be cooled.

15 In this case, when the end portion of the lower surface of the mounting base 32 of the cooling unit R is mounted on the top sides 44B of the push-up member 44 and the arm portion 48 is pushed down from a raised state of the portion, the mounting base 32 is pushed up and fixed.
20 Therefore, the attaching operation of the cooling unit R is facilitated.

Especially, since the push-up member 44 is constituted by bending the steel rod having the circular section, the push-up member can be brought into point
25 contact with the lower surface of the mounting base 32, and resistance is reduced. Therefore, the push-up member 44 can easily be rotated, and an attaching operability of the

cooling unit R is improved. Since the push-up member 44 itself is constituted of the steel rod, a space required for the push-up member 44 can be reduced, and space saving can be achieved as compared with a case where the push-up member 44 is constituted of a plate-like member extended in a longitudinal direction. It is possible to avoid a disadvantage that the cooling unit R is insufficiently pushed up owing to deflection of the plate-like member. The upper surface of the cooling box 22 including the opening can securely closely be pressed onto the bottom wall 2A.

Moreover, the arm portion 48 which rotates the push-up member 44 is bent and formed integrally with the push-up member 44. Therefore, a rotating operation of the push-up member 44 can be facilitated without involving any cost increase. Especially, unlike a conventional example in which an operating member is constituted of a large number of components and an operation support, that is, a rotary shaft is a screw, according to the present invention, the arm portion 48 formed integrally with the push-up member 44 rotates the rotary shaft 44A of the push-up member 44. Therefore, strength can be improved, and a stable push-up operation of the cooling unit R can be performed. Since the number of the components can be reduced, the cost can be reduced.

Furthermore, according to the present embodiment, the tip end of the arm portion 48 is provided with the grip

portion 48A bent in the direction away from the mounting base 32. Therefore, when the grip portion 48A of the arm portion 48 is gripped to perform the rotating operation, a disadvantage that the mounting base 32 is manually touched can be avoided, and the operability can be improved.

In addition, when the arm portion 48 is pushed down, the push-up member 44 can be rotated so as to push up the mounting base 32. Therefore, the operability is improved, and the cooling unit R can easily be pushed up.

It is to be noted that when the push-up member 44 operates the arm portion 48, the top side 44B is rotated upwards, that is, the cooling unit R is pushed down onto the bottom wall 2A of the insulation box member 2. In this state, the top sides 44B are prohibited from being further rotated toward the inside of the mechanical chamber 21 by the flange 47 positioned at the fixing member 41 on the side of the mechanical chamber 21. Therefore, it is possible to avoid a disadvantage that the push-up member 44 is rotated more than necessary to lower the position of the top side 44B.

According to the above constitution, the top sides 44B of the push-up member 44 abut on the lower surface of the mounting base 32 of the cooling unit R to push up the mounting base. Therefore, a special push-up structure does not have to be constituted on the side of the cooling unit R, and the cost can be reduced. The fixing member 41 and the push-up member 44 can be attached to the angle 12 of

the mechanical chamber 21 to constitute the push-up mechanism. Therefore, the constitution can be applied to various types of cooling units R, and versatility is enlarged.

5 Furthermore, according to the present embodiment, the stopper 42 is disposed as the positioning means at the rear end of the fixing member 41. Therefore, when the cooling unit R is inserted into the mechanical chamber 21, a position where the cooling unit is attached can be
10 determined, and the attaching operation of the unit can be facilitated. When the arm portion 48 is pushed down, the cooling unit R is pushed up. At this time, the arm portion 48 is positioned at the front portion of the mounting base 32 of the cooling unit R. Therefore, the arm portion 48
15 can inhibit forward movement of the cooling unit R. In consequence, the cooling unit R can easily be positioned, and the attaching operation of the unit can be simplified. Moreover, forward and backward movements of the cooling unit R brought into a fixed state can be regulated, and the
20 cooling unit R can stably be fixed.

 Moreover, this arm portion 48 is pushed down and positioned at the front end of the mounting base 32 pushed up, and the fixing hole 48B formed at the arm portion 48 is superimposed on a fixing hole 32B formed beforehand at the
25 front end of the mounting base 32 and fixed via a screw (not shown). In consequence, it is possible to avoid a disadvantage that the mounting base 32 lowers owing to a

weight of the cooling unit R.

It is to be noted that in the above embodiment, the cooling unit R is inserted into the mechanical chamber 21 from the proximal side to the distal side, but the present
5 invention is not limited to this embodiment.

Claims:

1. A cooling storage comprising:

a storage chamber;

a mechanical chamber located under the storage chamber;

5 an insulation box member surrounding the storage chamber, a bottom wall of the insulation box member defining a ceiling of the mechanical chamber;

a cooling unit to be inserted in the mechanical chamber, said cooling unit comprising:

10 a cooler and a blower stored in a cooling chamber defined by a cooling box said cooling chamber having a discharge side and a suction side; and

a compressor;

said cooler, blower and compressor being integrally arranged on a mounting base;

15 a cold air discharge port and a cold air suction port formed in the bottom wall of the insulation box member to connect the inside of the storage chamber to the inside of the mechanical chamber;

positioning means for positioning the cooling unit in the mechanical chamber so that said discharge side and said suction side of the cooling chamber are arranged, respectively, under said cold air discharge port and said cold air suction port;

20 a push-up member, defined by a bent steel rod of circular cross-section, for abutting on opposite sides of a lower surface of the mounting base, or on distal and proximal sides of the lower surface of the mounting base, with respect to an insertion direction of the cooling unit into the mechanical chamber, said push-up member adapted to rotatably push up the cooling unit toward the bottom wall of the insulation box member.

2. A cooling storage according to claim 1, further comprising a bent arm portion formed integrally with the push-up member, the arm portion being adapted to rotate the push-up member.

30 3. A cooling storage according to claim 2, wherein the push-up member is adapted to push down the arm portion from a raised state of the arm portion toward the mounting base to rotate and elevate the mounting base.

4. A cooling storage according to claim 3, wherein the arm portion is fixed to the mounting base in a state in which the arm portion is pushed down.

5. A cooling storage according to claim 3, wherein a tip end of the arm portion is bent away from the mounting base.

6. A cooling storage substantially as hereinbefore described with reference to the accompanying drawings.