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(54) WATER SPRAY DEVICE FOR ICE MAKING MACHINE

WASSERSPRÜHVORRICHTUNG FÜR EINE EISHERSTELLUNGSMASCHINE

DISPOSITIF DE PULVÉRISATION D'EAU POUR MACHINE À GLACE

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Description

TECHNICAL FIELD

[0001] The present invention relates to a water spray device for an ice making machine, the water spray device supplying ice making water to an ice making region of an ice making section. A water spray device according to the preamble of claim 1 is known for example from US-A-4 458 503.

BACKGROUND ART

[0002] As an automatic ice making machine that continuously makes ice, there is known a flow-down type ice making machine configured to generate ice by supplying ice making water from a water sprayer to a surface side (an ice making surface) of an ice making section arranged in a vertical direction (see, e.g., Patent Document 1). As shown in FIG. 10 or FIG. 11, an ice making section 12 of the flow-down type ice making machine is basically constituted of a pair of ice making plates 14, 14 that are substantially vertically erected and arranged to face each other and a cooling pipe 16 that is provided between both the ice making plates 14, 14 and formed into a meandering shape to circulate and supply a refrigerant therein. On an ice making surface of each ice making plate 14, a plurality of ice making regions 20 where ice is produced are defined in a width direction by a plurality of partition members 18 extending in the vertical direction. Further, a water sprayer 22, which supplies to the ice making regions 20 the ice making water circuited and supplied from a circulation pump 54, is provided above the ice making section 12.

[0003] The water sprayer 22 has an elongated cylindrical body formed with a substantially rectangular cross section and has its longitudinal extending in the width direction thereof above the ice making section 12 in parallel therewith. Furthermore, an introduction section 24 connected with an ice making water supply tube 52 led out from the circulation pump 54 is formed at one end portion of the water sprayer 22 in the width direction thereof, and the other end portion of the same is closed. Moreover, a plurality of water spray holes 26 are formed in a bottom portion of the water sprayer 22 to be apart from each other in the width direction in accordance with the respective ice making regions 20. It is to be noted that each water spray hole 26 is set to have a small diameter of approximately 3 mm to 5 mm so that the water supply hole 26 can be prevented from being clogged with foreign particles included in the ice making water.

[0004] In the flow-down type ice making machine, at the time of an ice making operation, the circulation pump 54 is operated to supply the ice making water to the water sprayer 22 under pressure, and the ice making water is sprayed to the respective ice making regions 20 via the respective water spray holes 26. At the same time, the refrigerant is circulated and supplied to the cooling pipe 16 from a non-illustrated condenser so that the ice making water sprayed from the water sprayer 22 to flow down on the ice making surfaces can be cooled and frozen at positions where the ice making water comes into contact with the cooling pipe 16 on the ice making surfaces. It is to be noted that, in a deicing operation, supply of the ice making water to the water sprayer 22 is stopped, and deicing water is supplied to back sides of the ice making plates 14, 14 from deicing water supplying means 28 (see FIG. 11) provided below the water spray 22. Additionally, a hot gas is supplied to the cooling pipe 16, and frozen portions of the ice generated in the ice making regions 20 with respect to the ice making plates 14, 14 are molten, whereby the ice falls off each ice making plate 14.

Patent document 2 describes an ice making apparatus and a respective method. Here, ice-making water flows from a pump into a cylindrically-shaped body section. Water is then directed downwardly into a water distribution section. From there, water can flow into a water manifold section through tapered bores, the water manifold section being open to the atmosphere. From there, it flows through slots to the ice form section, where ice is formed.

Patent Document 1: Japanese Patent Application Laid-open (Kokai) No. 7-218066
Patent Document 2: US Patent Nr. 4 458 503

DISCLOSURE OF INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0005] In the water sprayer 22, since the ice making water supplied by the circulation pump 54 under pressure swiftly flows toward the closed end from the introduction section 24 and a flow rate of the ice making water is high on the introduction section 24 side whilst a pressure is high on the closed end side, there is pointed out a problem that an amount of the ice making water sprayed from the water spray holes 26 on the closed end side is large but an amount of the ice making water sprayed from the water spray holes 26 on the introduction section 24 is small. In some cases, air may be sucked in from the water spray holes 26 on the introduction section 24 side so that the ice making water cannot be sprayed from the water spray holes 26. Since the amount of ice making water to be supplied to each ice making region 20 from the water sprayer 22 varies as described above, not only ice having a fixed size cannot be generated in each ice making region 20 but also ice having a different shape or clouded ice may be produced, thus greatly violating a commercial value of the ice. Further, the ice making water sprayed from the water spray holes 26 may obliquely flow out toward the closed end side from the introduction section 24 side, and it may be splashed to the outside of the ice making section 12 beyond the partition members 18 to bring negative effects, e.g., deficiency of the ice making

water or melting ice stored below the ice making section 12.

[0006] That is, in view of the above-described problem inherent in the water spray device for the ice making machine according to the present technology, the present invention is proposed to preferably solve this problem, and an object of the present invention is to provide a water spray device for an ice making machine that can uniformly supply ice making water to ice making regions of an ice making section.

MEANS FOR SOLVING PROBLEM

[0007] To solve the above-described problem and achieve the predetermined object, according to the present invention, there is provided a water spray device as defined in claim 1.

EFFECT OF THE INVENTION

[0008] According to the water spray device for an ice making machine of the present invention, the ice making water can be uniformly supplied to the ice making region of the ice making section.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

[FIG. 1] A front view showing an ice making section of a flow-down type ice making machine having a water sprayer according to a preferred embodiment of the present invention arranged therein;
[FIG. 2] A side cross-sectional view showing the ice making section of the flow-down type ice machine having the water sprayer according to the embodiment arranged therein;
[FIG. 3] (a) is a plan view showing the water sprayer according to the embodiment and FIG. 3(b) is a cross-sectional view taken along a line A-A in FIG. 3(a);
[FIG. 4] (a) is a plan view showing a water sprayer including a communication section according to Modification 1 and FIG. 4(b) is a cross-sectional view broken along a line B-B in FIG. 4(a); Modification 1 is not in accordance with the invention;
[FIG. 5] A cross-sectional view showing another example of the communication section according to Modification 1;
[FIG. 6] (a) is a plan view showing a water sprayer including a communication section according to Modification 2 and FIG. 6(b) is a cross-sectional view broken along aline C-C in FIG. 6(a); Modification 2 is not in accordance with the invention;
[FIG. 7] A cross-sectional view showing another example of the communication section according to Modification 2;
[FIG. 8] A cross-sectional view showing still another example of the communication section according to Modification 2;
[FIG. 9] A plan view of a water sprayer showing another example of a buffer section;
[FIG. 10] A front view showing an ice making section of a flow-down type ice making machine having a conventional water sprayer arranged therein; and
[FIG. 11] A side cross-sectional view showing the ice making section of the flow-down type ice making machine having the conventional water sprayer arranged therein.

EXPLANATIONS OF LETTERS OR NUMERALS

[0010]

12 ice making section,
20 ice making region,
32 water spray section,
34 water spray hole,
36, 90, and 92 buffer section,
38 introduction section,
40, 62, 67, 72, 76, and 80 communication section,
42, 64, 68, 74, 78, and 82 communication hole,
90a and 92a buffer space (inner space)

BEST MODE(S) FOR CARRYING OUT THE INVENTION

[0011] A preferred embodiment of a water spray device for an ice making machine according to the present invention will now be described hereinafter with reference to the accompanying drawings. It is to be noted that like reference numerals denote elements equal to constituent elements of the ice making section shown in FIG. 10 and FIG. 11 to omit a detailed description thereof for convenience of explanation.

EMBODIMENTS

[0012] As shown in FIG. 1 or FIG. 2, an ice making section 12 of a flow-down type ice making machine having a water sprayer according to an embodiment arranged therein is longitudinally arranged so that each plate surface can substantially vertically extend, and it is constituted of a pair of ice making plates 14, 14 facing each other. A cooling pipe 16 formed into a repetitive meandering shape so that a linear portion can extend in a width direction of the ice making section 12 is arranged between opposed surfaces of both the ice making plates 14, 14, and the linear portion thereof is in contact with back sides (the opposed surfaces) of both the ice making plates 14, 14. An opposite side of the surface of each ice making plate 14 facing the other ice making plate functions as an ice making surface, and a plurality of partition members 18 are provided to protrude along a vertical direction of the ice making surface of each ice making plate 14. The plurality of partition members 18 are ar-

ranged so as to be apart from each other in a width direction of each ice making plate 14, and these partition members 18 define a plurality of ice making regions 20 in parallel along the width direction of each ice making plate 14 on the ice making surfaces. Further, above the ice making section 12, a water sprayer 30 that supplies ice making water to the ice making regions 20 of each ice making plate 14 at the time of an ice making operation and deicing water supplying means 28 for supplying deicing water to the back side of each ice making plate 14 at the time of a deicing operation are arranged.

[0013] An ice making water tank 50 that stores the ice making water flowing down on the ice making plates 14, 14 is arranged below the ice making section 12, and the ice making water tank 50 is connected to a circulation pump (pressure-feeding means) 54 through an ice making water supply tube 52. Further, at the time of the ice making operation, a refrigerant is supplied from a freezing system to the cooling pipe 16, and the ice making water is supplied to each ice making region 20 from the water sprayer 30, whereby a substantially semicircular ice piece is generated in each ice making region 20. It is to be noted that, at the time of the deicing operation, a hot gas is supplied to the cooling pipe 16 by valve switching of the freezing system, and the deicing water is supplied to the back sides of the ice making plates 14, 14 from the deicing water supplying means 28.

[0014] As shown in FIGS. 3, the water sprayer 30 includes a water spray section 32 arranged above the ice making section 12, a buffer section 36 that receives the ice making water delivered under pressure by the circulation pump 54, and a communication section 40 that achieves communication and connection between the water spray section 32 and the buffer section 36. In the water sprayer 30 according to the embodiment, the water spray section 32, the buffer section 36, and the communication section 40 are integrally formed of a synthetic resin material.

[0015] As shown in FIG. 2, the water spray section 32 has a hollow cylindrical body having a distribution space 32a that distributes the ice making water formed therein, and it is formed with a substantially rectangular cross section in the embodiment. Furthermore, the water spray section 32 is arranged above the ice making section 12. The water spray section 32 is provided to extend over the entire width direction of each ice making plate 14, and it is formed of a size that substantially matches a dimension from a protruding end of the partition member 18 of one ice making plate 14 to a protruding end of the partition member 18 of the other ice making plate 14 (see FIG. 2). In a bottom portion of the water spray section 32, each water spray hole group consisting of a plurality of water spray holes 34, which are arranged in parallel to be apart from each other in an opposing direction of the pair of ice making plates 14, 14 and communicate with the distribution space 32, is provided in association with each ice making plate 14 (see FIG. 3). Furthermore, the respective water spray holes 34 constituting the water spray hole group are placed on the ice making surface side of each ice making plate 14, arranged to be apart from each other in the width direction of each ice making plate 14 in association with the respective ice making regions 20 of each ice making plate 14, and also arranged at central portions of the respective ice making regions 20 in the width direction.

[0016] As shown in FIG. 2, the buffer section 36 has a hollow cylindrical body having a buffer space 36a in which the ice making water is distributed, and it is formed with a circular cross section in the embodiment. Moreover, the buffer section 36 is provided next to the water spray section 32. Here, the buffer section 36 is provided to extend in the width direction of the ice making section 12, and it is formed with a dimension equal to a size of the water spray section 32 in the width direction. Additionally, an introduction section 38 connected with the ice making water supply tube 52 is provided at one end of the buffer section 36 in the width direction, and the other end of the same in the width direction is closed.

[0017] The communication section 40 includes communication holes 42 communicating with the distribution space 32a of the water spray section 32 and the buffer space 36a of the buffer section 36, and it is configured in such a manner that the communication holes 42 are provided to extend in a lateral direction crossing an inflow direction of the ice making water supplied into the buffer space 36a of the buffer section 36 through the introduction section 38 (see FIG. 2). The communication section 40 according to the embodiment is constituted of a plurality of angular cylindrical bodies 41 arranged in the width direction of the ice making section to be apart from each other, and one communication hole 42 is opened in each angular cylindrical body 41 (see FIGS. 3). The plurality of communication holes 42 are all formed with the same cross-sectional dimension (see FIG. 3(b)). Further, the plurality of communication holes 42 are provided so as to communicate with positions deviated in the width direction from the water spray holes 34 arranged in the water spray section 32 to be apart from each other in the width direction of the water spray section 32 (see FIG. 3(a)). It is to be noted that each communication hole 42 according to the embodiment is arranged at the center between the water spray holes 34, 34 that are adjacent to each other.

[Function of Embodiment]

[0018] A function of the water sprayer 30 according to the embodiment will now be described. At the time of the ice making operation, in the water sprayer 30, the ice making water delivered under pressure by the circulation pump 54 from the ice making water tank 50 is supplied into the buffer space 36a of the buffer section 36 from the introduction section 38 via the ice making water supply tube 52. Since one end of the buffer section 36 in the width direction that is placed in the inflow direction of the ice making water is closed, the ice making water strikes

on the closed end of the buffer section 36 to reduce its flow velocity, and then it is led to the distribution space 32a of the water spray section 32 from the buffer space 36a through each communication hole 42. That is, the ice making water is led into the distribution space 32a of the water spray section 32 via each communication hole 42 from the lateral direction crossing a separating direction (the width direction of the ice making section 12) of the plurality of water spray holes 34 constituting each water spray hole group. Furthermore, the ice making water strikes on an inner wall of the water spray section 32 facing the communication holes 42 in the distribution space 32a to further reduce its flow velocity, and it is guided to both sides in the width direction along the inner wall. Therefore, in the distribution space 32a of the water spray section 32, a difference in flow velocity and a difference in pressure of the ice making water are reduced in the width direction, and hence the ice making water can be uniformly flowed out from the plurality of water spray holes 34 provided in the water spray section 32 in a well-balanced manner.

[0019] As described above, the water sprayer 30 can uniform amounts of the ice making water supplied to the corresponding ice making regions 20 from the plurality of water spray holes 34 by suppressing an influence of the flow velocity or the pressure of the ice making water in the water spray section 32 as a configuration of receiving the pressure-fed ice making water in the buffer section 36 and leading the received ice making water to the water spray section 32 through the communication holes 42 of the communication section 40. That is, in the ice making section 12, ice can stably grow in each ice making region 20, resulting ice pieces are of a uniform size, and generation of ice having a different shape or clouded ice due to excess or deficiency of the ice making water can be prevented. Moreover, since the ice making section 12 can uniformly make the ice in the entire ice making regions 20 in each ice making plate 14, its cooling efficiency and deicing efficiency are excellent, thereby improving an ice making capacity. Additionally, since the flow velocity of the ice making water is suppressed, it does not obliquely flow out from each water spray hole 34, and an inconvenience, e.g., insufficiency of the ice making water or melting the ice stored below the ice making section 12 due to scattering toward the outside of the ice making section 12 can be avoided.

[0020] The water sprayer 30 functions so that each of the plurality of communication holes 42 can reduce the flow velocity of the ice making water. Further, in the water sprayer 30, when the respective communication holes 42 are provided to communicate with the positions deviated in the width direction from the water spray holes 34 in the water spray section 32, the ice making water that has flowed into the distribution space 32a of the water spray section 32 can be prevented from immediately flowing out from the water spray holes 34, thus flowing out from each water spray hole 34 the ice making water buffered in the water spray section 32.

(Modifications)

[0021] The present invention is not restricted to the configuration of the embodiment, and it can be modified as follows. In modifications described with reference to FIG. 4 to FIG. 9, like reference numerals denote structures equal to the ice making section 12 and the water sprayer 30, thereby omitting a description thereof. As mentioned above, the embodiment shown in figures 4 to 8 are not in accordance with the invention.

[0022]

(1) Although the communication section 40 is constituted of the plurality of angular cylindrical bodies 41 that are independent from each other in the embodiment, each communication hole 64 may be formed by expanding a communication section 62 so that one of plate-like portions 63 facing each other can be partially separated from the other like a water sprayer 30 depicted in FIGS. 4. That is, as the water sprayer 30, a configuration that the plurality of communication holes 64 are provided in one communication section 62 to be apart from each other in a width direction can be adopted. Each communication hole 64 has a circular cross-sectional shape, and the plurality of communication holes 64 is all formed of the same size (see FIG. 4(b)).

(2) As shown in FIG. 5, a communication section 67 may be configured in such a manner that a size of each communication hole 68 is reduced from one end side of a buffer section 36 on which an introduction section 38 is provided toward the other end side of the same in a width direction. Here, in the buffer section 36, although a difference in flow velocity of ice making water is buffered to some extent by a buffer space 36a, there is a difference in flow velocity between an introduction section 14 side and a closed end side, the ice making water is hard to flow into each communication hole 68 provided on an introduction section 38 side and, on the other hand, the ice making water is easy to flow into each communication hole 68 provided on the closed end side. That is, a size of each communication hole 68 on the introduction section 38 side of the buffer section 36 into which the ice making water is hard to flow is set big whilst a size of each communication hole 68 on the closed end side of the buffer section 36 into which the ice making water is easy to flow is set to be smaller than the size of the counterpart on the introduction section 38 side, thereby balancing amounts of the ice making water flowing into the plurality of communication holes 68. Therefore, the ice making water can uniformly flow into a distribution space 32a of a water spray section 32 from the plurality of communication holes 68 along the width direction, and amounts of the ice making water sprayed from a plurality of water spray holes 34 can be also further uniformed.

(3) Although the communication section 40 is constituted of the plurality of angular cylindrical bodies 41 that are independent from each other in the embodiment, a communication section 72 may be constituted of an elongated single cylindrical body formed to extend in a width direction of an ice making section 12 like a water sprayer 30 depicted in FIG. 6. In the communication section 72, one communication hole 74 having a straight side extended in a width direction of an ice making section 12 is provided. A configuration that one communication hole 74 is provided in one communication section 72 in this manner enables facilitating formation. It is to be noted that the plurality of communication holes 74 are formed to have the same vertical dimension along the width direction (see FIG. 6(b)).

(4) As shown in FIG. 7, a communication section 76 may be configured in such a manner that a size of a communication hole 78 is gradually reduced from one end side of a buffer section 36 on which an introduction section 38 is provided toward the other end side of the same along a width direction. It is to be noted, like a communication section 80 as another example depicted in FIG. 8, a communication hole 82 may have a configuration that its size is reduced in stages from one end side toward the other end side along a width direction rather a configuration that its size is gradually reduced from one end side toward the other end side along the width direction. Although a difference in flow velocity of ice making water is buffered to some extent by a buffer space 36a in the buffer section 36, since there is a difference in flow velocity between an introduction section 38 side and a closed end side, the ice making water is difficult to flow into the communication hole 78 or 82 on the introduction section 38 side whilst the ice making water is easy to flow into the communication hole 78 or 82 on the closed end side. That is, a vertical dimension of the communication hole 78 or 82 on the introduction section 38 side of the buffer section 36 into which the ice making water is hard to flow is set big and, on the other hand, a vertical dimension of the same on the closed end side of the buffer section 36 into which the ice making water is easy to flow is set to be smaller than that on the introduction section 38 side, thereby balancing an amount of the ice making water distributed through the entire communication hole 78 or 82. Therefore, the ice making wafer can uniformly flow into a distribution space 32a of a water spray section 32 from the communication hole 78 or 82 along the width direction, and amounts of the ice making water sprayed from a plurality of water spray holes 34 can be also further uniformed.

(5) Although the buffer section 36 according to the embodiment is formed in such a manner that the buffer space 36a can have the same cross-sectional dimension from the one end side toward the other end side along the width direction, it is possible to adopt a configuration that a buffer space 90a is gradually narrowed from one end side on which an introduction section 38 is provided toward the other end side along a width direction like a buffer section 90 according to still another example depicted in FIG. 9(a). Furthermore, like a buffer section 92 according to yet another example depicted in FIG. 9(b), a configuration that a buffer space 92a is narrowed in stages from one end side on which an introduction section 38 is provided toward the other end side along a width direction may be adopted. According to the buffer section 90 or 92 as another example, ice making water that has flowed into a buffer space 90a or 92a from the introduction section 38 strikes on not only a closed end side but also an inner wall of the buffer section 90 or 92 placed in an advancing direction, thus improving a buffer function of the buffer section 90 or 92 with respect to the ice making water.

(6) Although the configuration that the buffer section receives the ice making water delivered under pressure from the pump as the pressure-feeding means has been described in the embodiment, the invention according to the present application can be likewise applied to a configuration that pressurized ice making water is supplied by pressure-feeding means provided outside the ice making machine from an external water source such as a water service.

(7) Although the example where the invention according to the present application is applied to the ice making section of the flow-down type ice making machine has been described, the invention according to the present application can be likewise applied to a water fountain type ice making machine having a cell type ice making section that sprays and supplies ice making water to an ice making chamber provided in the ice making section to generate ice or a plate type ice making machine that generates plate-like ice.

Claims

1. A water spray device for an ice making machine, the device being configured to receive ice making water delivered under pressure and supply the same to an ice making region (20) of an ice making section (12), comprising:

   a water spray section (32) that is provided above the ice making section (12) to extend in a width direction of the ice making section (12) and to supply the ice making water to the ice making region (20) of the ice making section (12) from water spray holes (34) arranged apart from each other in the width direction;

   a buffer section (36, 90, 92) that is provided next to the water spray section (32) and has, at one

end in the width direction, an introduction section (38) that is configured to receive the ice making water delivered under pressure; and
a communication section (40) that is provided between the water spray section (32) and the buffer section (36, 90, 92) and is configured to lead the ice making water received by the buffer section (36, 90, 92) to the water spray section (32) through a communication hole (42), **characterized in that** the communication section (40) is constituted of a plurality of cylindrical bodies (41) arranged spaced apart from each other in the width direction of the ice making section (12), one communication hole (42) being opened in each cylindrical body (41),

the communication section (40) is configured in such a manner that a size of the communication hole (42) is reduced from one end side where the introduction section (38) of the buffer section (36, 90, 92) is provided toward the other end side, and
the plurality of communication holes (42) are provided so as to communicate with the water spray section (32) at positions deviated in the width direction from the water spray holes (34).

2. The water spray device for an ice making machine according to claim 1, wherein
each of the water spray section (32) and the buffer section (36, 90, 92) have a hollow cylindrical body, and the communication section (40) is constituted of a plurality of angular cylindrical bodies (41),
the water spray section (32), the buffer section (36, 90, 92), and the communication section (40) are integrally formed of a synthetic resin material, and
the communication section (40) is formed in such a manner that each of the communication holes (42) are provided so as to communicate with positions deviated in the width direction from the water spray holes (34) arranged in the water spray section (32) to be apart from each other in the width direction of the water spray section (32).

3. The water spray device for an ice making machine according to claim 1 or 2, wherein
the buffer section (92) is formed in such a manner that an inner space (92a) is narrowed in stages from one end side where the introduction section (38) of the buffer section (92) is provided toward the other end side.

Patentansprüche

1. Wassersprühvorrichtung für eine Eisherstellungsmaschine, wobei die Vorrichtung so eingerichtet ist, dass sie Wasser zur Eisherstellung unter Druck erhält und selbiges an einen Eisherstellungsbereich (20) eines Eisherstellungsabschnitts (12) liefert, aufweisend:

einen Wassersprühabschnitt (32), welcher oberhalb des Eisherstellungsabschnitts (12) vorgesehen ist, um sich in einer Weitenrichtung des Eisherstellungsabschnitts (12) zu erstrecken und um das Wasser zur Eisherstellung an einen Eisherstellungsbereich (20) des Eisherstellungsabschnitts (12) aus Wassersprühlöchern (34), welche voneinander getrennt in Weitenrichtung angeordnet sind, zu liefern;
einen Pufferabschnitt (36, 90, 92), welcher neben dem Wassersprühabschnitt (32) vorgesehen ist und an einem Ende in der Weitenrichtung einen Zuführabschnitt (38) besitzt, welcher dazu angepasst ist, das Wasser zur Eisherstellung zu empfangen, welches unter Druck geliefert wird; und
einen Kommunikationsabschnitt (40), welcher zwischen dem Wassersprühabschnitt (32) und dem Pufferabschnitt (36, 90, 92) angeordnet ist und dazu angepasst ist, Wasser zur Eisherstellung, welches vom Pufferabschnitt (36, 90, 92) erhalten wurde, zum Wassersprühabschnitt (32) durch ein Kommunikationsloch (42) zuzuleiten, **dadurch gekennzeichnet, dass** der Kommunikationsabschnitt (40) aus einer Vielzahl von zylindrischen Körpern (41), welche in der Weitenrichtung des Eisherstellungsabschnitts (12) voneinander entfernt angeordnet sind, zusammengesetzt ist, wobei ein Kommunikationsloch (42) in jedem zylindrischen Körper (41) geöffnet ist,
und der Kommunikationsabschnitt (40) in solch einer Art und Weise dazu angepasst ist, dass eine Größe des Kommunikationslochs (40) von einer Endseite, wo der Einführabschnitt (38) des Pufferabschnitts (36, 90, 92) vorgesehen ist, hin zur anderen Endseite geringer wird, und
die Vielzahl von Kommunikationslöchern (42) vorgesehen ist, dass sie mit dem Wassersprühabschnitt (32) an Positionen, welche in der Weitenrichtung von den Wassersprühlöchern (34) abweichen, kommunizieren.

2. Wassersprühvorrichtung für eine Eisherstellungsmaschine gemäß Anspruch 1, wobei
jeweils der Wassersprühabschnitt (32) und der Pufferabschnitt (36, 90, 92) einen hohlen zylindrischen Körper besitzen, und der Kommunikationsabschnitt (40) aus einer Vielzahl von ringförmigen zylindrischen Körpern (41) besteht,
wobei der Wassersprühabschnitt (32), der Pufferabschnitt (36, 90, 92) und der Kommunikationsabschnitt (40) integral aus einem synthetischen Harzmaterial ausgebildet sind, und
der Kommunikationsabschnitt (40) in solch einer Art

und Weise ausgebildet ist, dass jedes der Kommunikationslöcher (42) so vorgesehen ist, dass es von Positionen, welche in der Weitenrichtung von Wassersprühlöchern (34), welche in der Wassersprühvorrichtung (32) angeordnet sind, abweicht, kommuniziert, um getrennt voneinander in der Weitenrichtung des Wassersprühabschnitts (40) angeordnet zu sein.

3. Wassersprühvorrichtung für eine Eisherstellungsmaschine gemäß Anspruch 1 oder 2, wobei der Pufferabschnitt (92) in solch einer Art und Weise ausgebildet ist, dass ein innerer Raum (92a) in Stufen von einer Endseite, wo der Einführabschnitt (38) des Pufferabschnitts (92) vorgesehen ist, hin zur anderen Endseite schmäler wird.

Revendications

1. Dispositif de pulvérisation d'eau destiné à une machine de fabrication de glace, le dispositif étant configuré de manière à recevoir de l'eau de fabrication de glace délivrée sous pression et à délivrer celle-ci à une zone de fabrication de glace (20) d'une section de fabrication de glace (12), comprenant :

une section de pulvérisation d'eau (32) qui est agencée au-dessus de la section de fabrication de glace (12) afin de s'étendre dans une direction transversale de la section de fabrication de glace (12) et de délivrer l'eau de fabrication de glace à la zone de fabrication de glace (20) de la section de fabrication de glace (12) à partir d'orifices de pulvérisation d'eau (34) agencés séparément les uns des autres dans la direction transversale ;
une section tampon (36, 90, 92) qui est agencée à proximité de la section de pulvérisation d'eau (32) et comporte, à une première extrémité dans la direction transversale, une section d'introduction (38) qui est configurée de manière à recevoir l'eau de fabrication de glace délivrée sous pression ; et
une section de communication (40) qui est agencée entre la section de pulvérisation d'eau (32) et la section tampon (36, 90, 92) et est configurée de manière à conduire l'eau de fabrication de glace reçue par la section tampon (36, 90, 92) vers la section de pulvérisation d'eau (32) à travers un orifice de communication (42), **caractérisé en ce que** la section de communication (40) est constituée d'une pluralité de corps cylindriques (41) agencés séparément les uns des autres dans la direction transversale de la section de fabrication de glace (12), un orifice de communication (42) étant ouvert dans chaque corps cylindrique (41),
la section de communication (40) est configurée de telle manière qu'une dimension de l'orifice de communication (42) est réduite depuis un premier côté d'extrémité, sur lequel est agencée la section d'introduction (38) de la section tampon (36, 90, 92), vers l'autre côté d'extrémité, et les orifices de la pluralité d'orifices de communication (42) sont agencés de manière à communiquer avec la section de pulvérisation d'eau (32) à une position déviée dans la direction transversale à partir des orifices de pulvérisation d'eau (34).

2. Dispositif de pulvérisation d'eau destiné à une machine de fabrication de glace selon la revendication 1, dans lequel
chacune de la section de pulvérisation d'eau (32) et de la section tampon (36, 90, 92) présente un corps cylindrique creux et la section de communication (40) est constituée d'une pluralité de corps cylindrique angulaires (41),
la section de pulvérisation d'eau (32), la section tampon (36, 90, 92), et la section de communication (40) sont formées de manière unitaire en un matériau à base de résine synthétique, et
la section de communication (40) est formée de telle manière que chacun des orifices de communication (42) est agencé de manière à communiquer avec des positions décalées dans la direction transversale par rapport aux orifices de pulvérisation d'eau (34) agencés dans la section de pulvérisation d'eau (32) afin d'être séparés les uns des autres dans la direction transversale de la section de pulvérisation d'eau (32).

3. Dispositif de pulvérisation d'eau destiné à une machine de fabrication de glace selon la revendication 1 ou 2, dans lequel
la section tampon (92) est formée de telle manière qu'un espace interne (92a) est rétréci par paliers à partir d'un premier côté d'extrémité, sur lequel est agencée la section d'introduction (38) de la section tampon (92), vers l'autre côté d'extrémité.

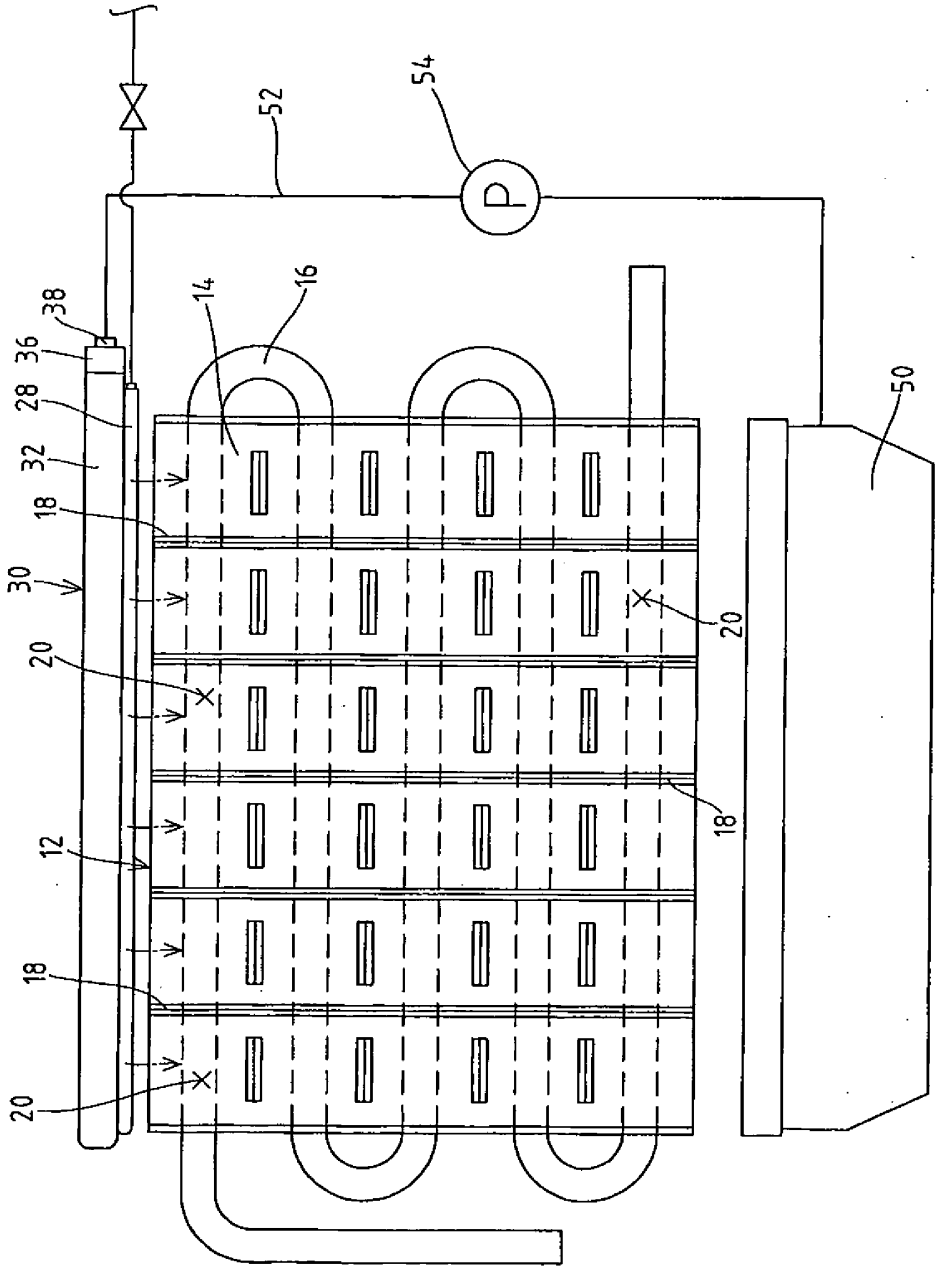
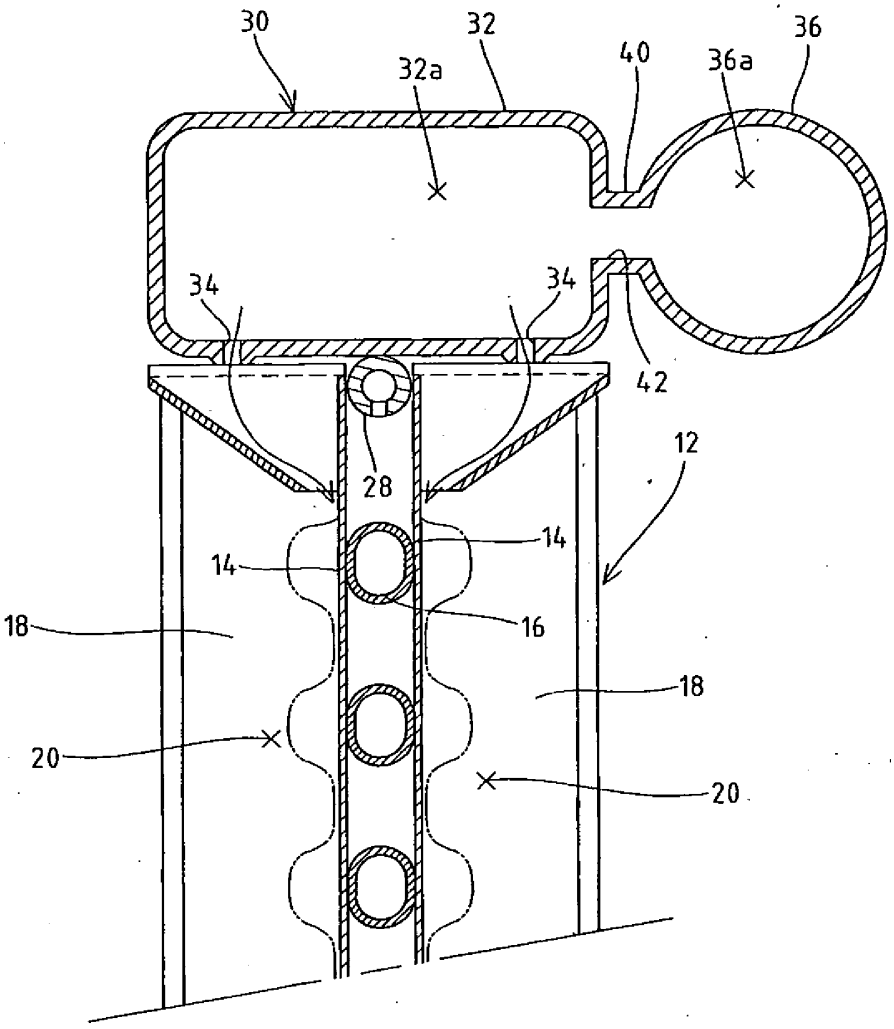


Fig.1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32
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36a
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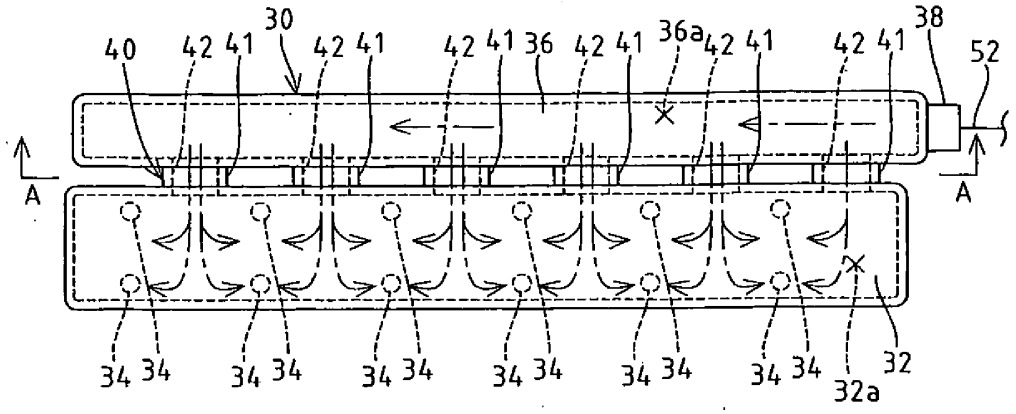
Fig.3

(a)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36a
42
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42
41
38
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A
A
34
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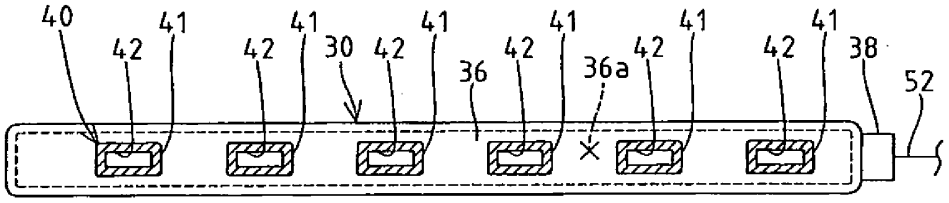
34
34
34
34
34
34
34
34
34
34
32
32a

(b)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36
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36a
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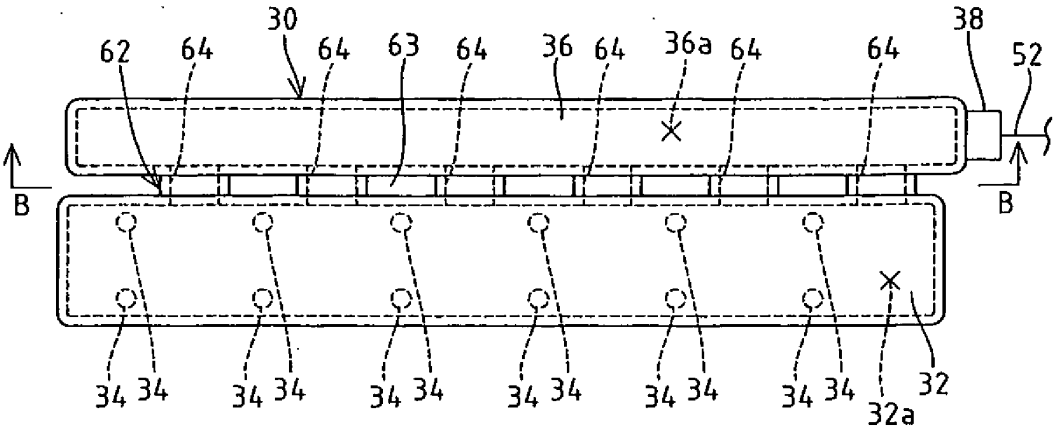
42
41
38
52

Fig.4

(a)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36a
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52
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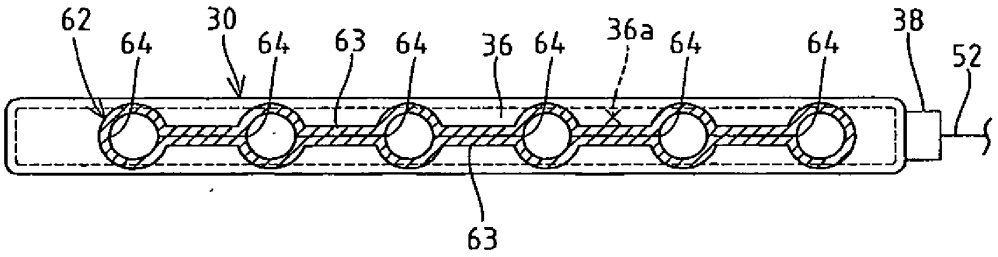
34 34
34 34
34 34
34 34
34 34
32a
32

(b)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36
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36a
64
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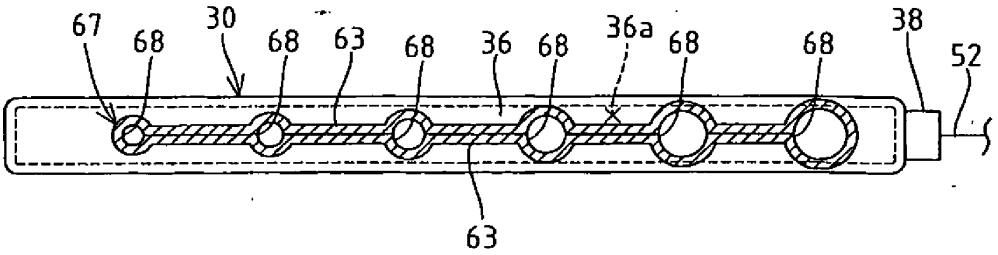
38
52
63

Fig.5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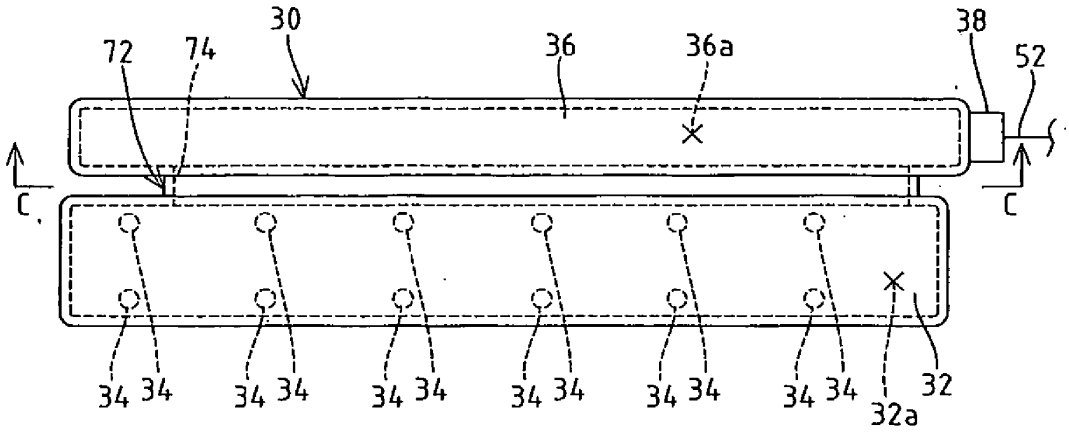
36
68
36a
68
68
38
52
63

Fig.6

(a)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36a
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52
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C
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34 34
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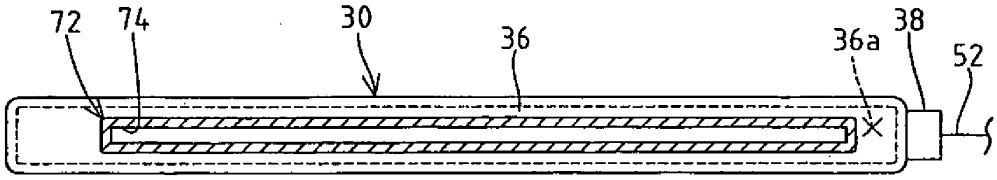
32
32a

(b)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36
36a
38
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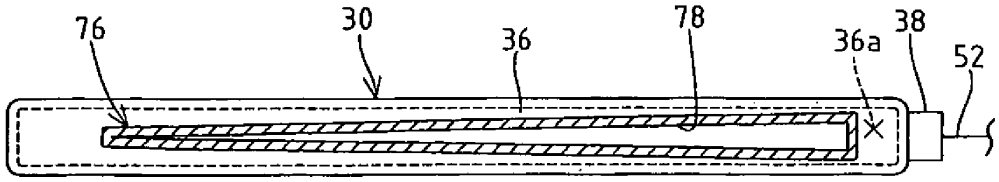
Fig.7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36a
38
52

Fig.8

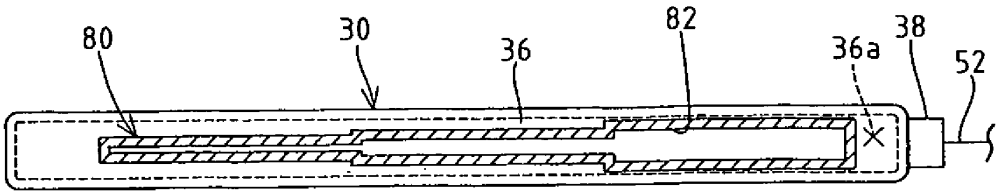
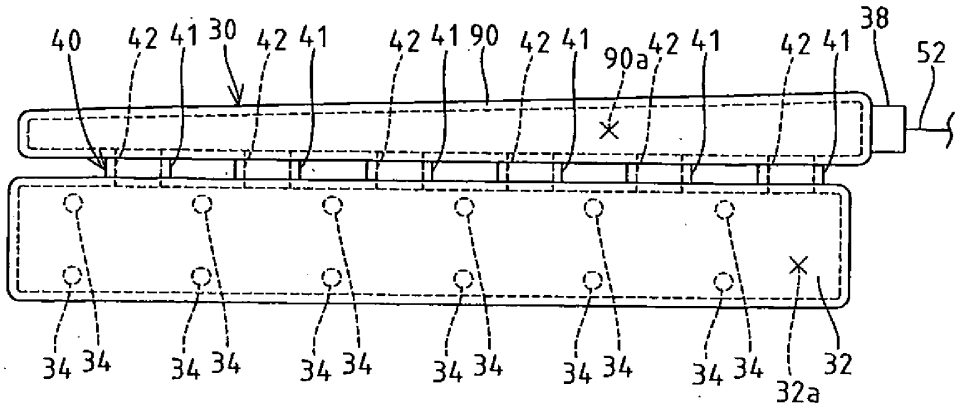


Fig.9

(a)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42 41
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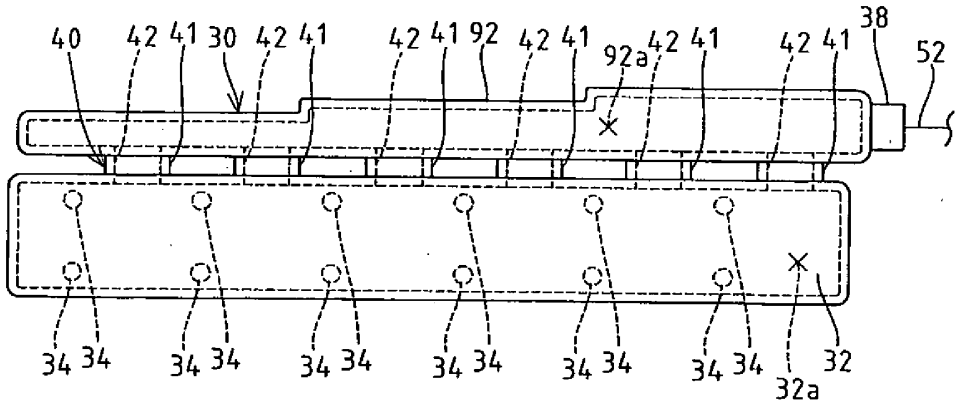
52
34 34
34 34
34 34
34 34
34 34
34 34
32
32a

(b)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34 34
32
32a

Fig.10
[Prior Art]

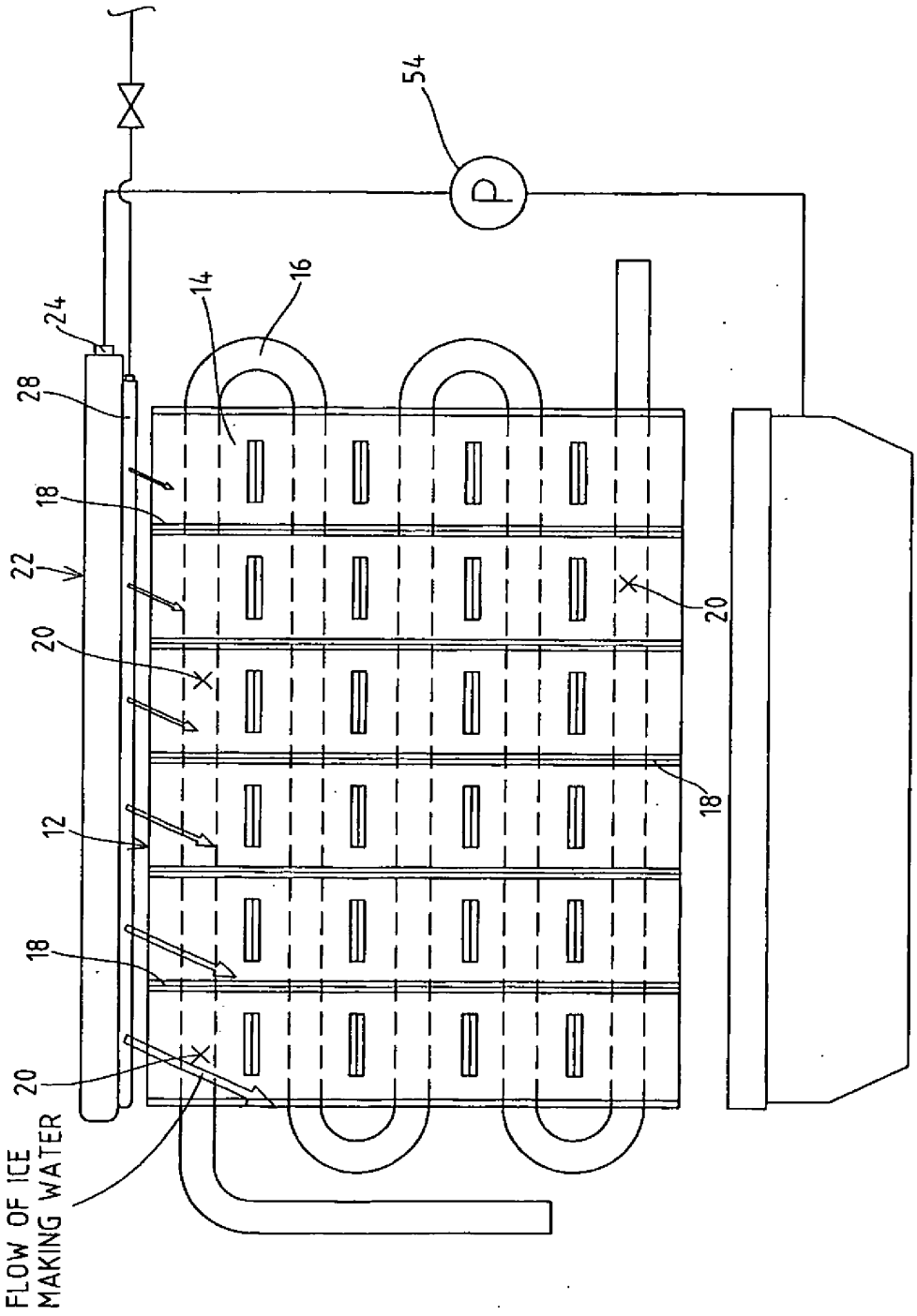
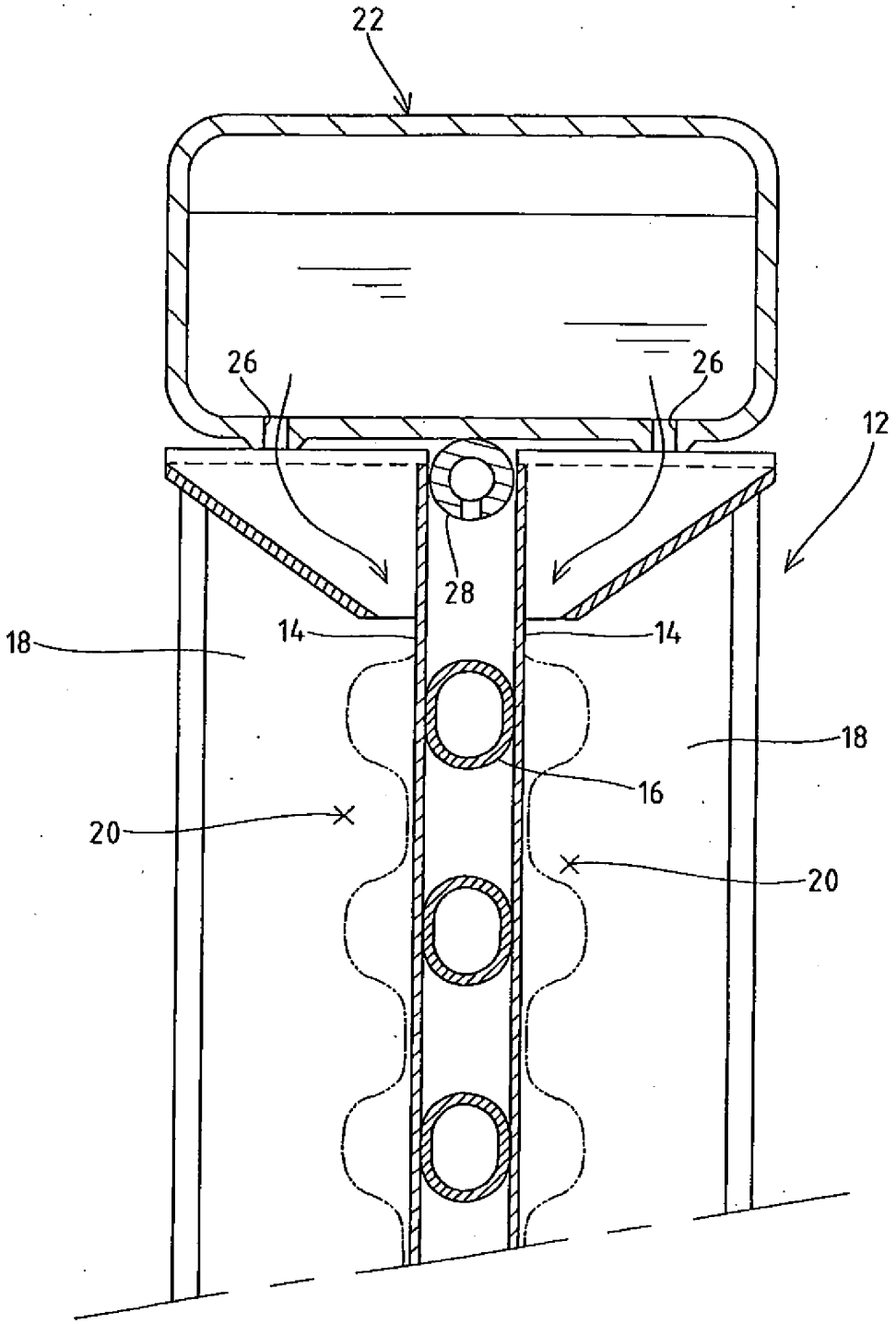


Fig.11
[Prior Art]



REFERENCES CITED IN THE DESCRIPTION

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- JP 7218066 A **[0004]**