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(54) **EVAPORATOR FOR AN ICE MACHINE**

VERDAMPFER FÜR EISMASCHINE

ÉVAPORATEUR POUR MACHINE À GLAÇONS

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Description

Object of the invention

[0001] The object of the present specification is an evaporator for an ice machine, the main and distinctive characteristic of which is based on enabling a greater speed to be achieved in the cooling on the surface thereof, by means of creating a turbulence which improves the exchange and the efficiency.

Background of the invention

[0002] Currently, diverse evaporators are known in the state of the art, which are generally configured from vertical cylinders (made of stainless steel or similar) connected to an outer jacket through which a refrigerant liquid flows which cools the inner surface of the cylinder, and wherein a water-feeding system using communicating tanks will maintain the level of liquid inside said cylinder, the ice being produced on the inner wall of the evaporator.

[0003] In said evaporator, a thermal exchange is carried out between the primary liquid (refrigerant) and the secondary liquid (water), and wherein the improvement in the global transmission coefficient thereof of the evaporator will directly affect the energy efficiency of the equipment.

[0004] There are mainly two types of systems which define the chamber of the primary or refrigerant fluid, a first one, by means of the flooded evaporator, wherein the chamber is diaphanous and the refrigerant liquid is injected through the lower portion of the evaporator, such that the jacket stays flooded, and wherein the refrigerant will evaporate with the thermal exchange of the inner tube and is drawn through the upper portion.

[0005] And a second type of system wherein the refrigerant liquid circulates through a helical channel that runs through the chamber of the primary fluid and in the path thereof it exchanges heat, evaporates and at the end of the circuit it has completely transformed into gas.

[0006] The applicant is also the holder of Spanish patent ES 2 451 539 which describes an evaporator for manufacturing ice, made up of a module having molds, and a series of ducts therein, through which the refrigerant gas circulates; the modules are joined together by means of a series of joining flanges; the ducts of the different modules are joined by means of joining reels; joining elbows join the different ducts of one same module, and closing the circuit through which the refrigerant gas circulates; fastening flanges fasten the joining elbows, as well as the inlet terminal and the outlet terminal to the module. US 4 760 710 A discloses an evaporator according to the preamble of claim 1.

Description of the invention

[0007] The technical problem solved by the present

invention is achieving an evaporator which improves the heat exchange and the efficiency thereof compared to other solutions known in the state of the art. To do so, the evaporator for an ice machine, object of the present specification, is set out in claim 1.

[0008] Due to the design thereof, the evaporator contemplated herein will favor the vertical outlet of the ice due to the presence of a plurality of mechanized grooves which decrease the effort necessary for said operation and therefore the noise generated during the same.

[0009] The presence of a steel spring inside the evaporator enables a helical circuit to be configured through which the refrigerant liquid flows in forced circulation, creating turbulence on the surface thereof which improves the heat exchange and therefore, the efficiency of the assembly.

Brief description of the figures

[0010] What follows is a very brief description of a series of drawings that aid in better understanding the invention and which are expressly related to an embodiment of said invention that is presented by way of a non-limiting example of the same.

FIG. 1. Shows a view of the evaporator for an ice machine according to the embodiment of the present invention.

FIG. 2 Shows a view of a cross section of the evaporator for an ice machine according to the embodiment of the present invention.

FIG. 3. Shows an inner view of the evaporator for an ice machine according to the embodiment of the present invention.

Description of a detailed embodiment of the invention

[0011] The attached figures show a preferred embodiment of the invention. More specifically, the evaporator for an ice machine, object of the present specification, is characterized in that it comprises a tube (1) which has, internally mechanized, a plurality of grooves (1a) favoring the vertical outlet of the ice, decreasing the effort necessary for said operation and therefore the noise generated.

[0012] The tube (1) will be manufactured from stainless steel or a material with equivalent mechanical characteristics.

[0013] On said tube (1), a second outer tube (2) with a larger diameter is placed, creating a cylindrical chamber, and wherein supplementary rings (3) are located on the upper and lower ends thereof which seal the assembly, improving the performance thereof with the pressure.

[0014] In a preferred embodiment, in both the lower and upper portions of the assembly made up of the tubes (1,2), a series of connections (4) are located for the inlet and/or outlet of the refrigerant liquid.

[0015] Between both tubes (1, 2), located on the first

tube (1), a steel spring (5) is located which perfectly adjusts to the two diameters of the cylindrical chamber, in order to prevent the by-pass of the refrigerant liquid between coils, making up a helical circuit which forces the circulation of the refrigerant liquid.

[0016] According to the invention, the spring (5) has a smaller passage (5a) at the beginning thereof, and a larger passage (5b) at the end thereof.

Claims

1. An evaporator for an ice machine comprising a tube (1) on which a second outer tube (2) with a larger diameter is placed, creating a cylindrical chamber, wherein the tube (1) incorporates a plurality of mechanized grooves (1a) therein, favoring the outlet of the ice and wherein supplementary rings (3) are located on the upper and lower ends thereof which seal the assembly; and that **is characterized in that** the evaporator incorporates a spring (5) located on the tube (1), wherein the spring (5) configures a helical circuit through which the refrigerant liquid flows in forced circulation, and **in that** the spring (5) has a smaller passage (5a) at the beginning thereof, and a larger passage (5b) at the end thereof.
2. The evaporator for an ice machine according to claim 1, wherein it incorporates a series of connections (4) in both the lower and upper portions of the assembly made up by the tubes (1, 2).
3. The evaporator for an ice machine according to any of claims 1 - 2 wherein the tube (1) is made of stainless steel or a material with equivalent mechanical characteristics.

Patentansprüche

1. Verdampfer für eine Eismaschine, der ein Rohr (1) umfasst, auf das ein zweites äußeres Rohr (2) mit einem größeren Durchmesser aufgesetzt ist, wodurch eine zylindrische Kammer geschaffen wird, wobei das Rohr (1) eine Vielzahl mechanisch hergestellter Rillen (1a) aufweist, die den Auslass des Eises begünstigen, und wobei sich Zusatzringe (3) an dem oberen und dem unteren Ende desselben befinden, die die Anordnung abdichten, und der **dadurch gekennzeichnet ist, dass** der Verdampfer eine Feder (5) enthält, die sich an dem Rohr (1) befindet, wobei die Feder (5) einen schraubenförmigen Kreisweg bildet, über den die Kühlflüssigkeit in Zwangsumlauf strömt, und dadurch, dass die Feder (5) an ihrem Anfang einen kleineren Durchlass (5a) und an ihrem Ende einen größeren Durchlass (5b) aufweist.

2. Verdampfer für eine Eismaschine nach Anspruch 1, wobei er eine Reihe von Anschlüssen (4) sowohl in dem unteren als auch in dem oberen Abschnitt der durch die Rohre (1, 2) gebildeten Anordnung enthält.

3. Verdampfer für eine Eismaschine nach einem der Ansprüche 1 - 2, wobei das Rohr (1) aus rostfreiem Stahl oder einem Material mit gleichwertigen mechanischen Eigenschaften besteht.

Revendications

1. Un évaporateur pour une machine à glace comprenant un tube (1) sur lequel est placé un deuxième tube extérieur (2) de plus grand diamètre, créant une chambre cylindrique, le tube (1) incorporant une pluralité de rainures mécanisées (1a) en lui, favorisant la sortie de la glace et des anneaux supplémentaires (3) étant situés sur ses extrémités supérieure et inférieure qui rendent l'ensemble étanche ; et qui est **caractérisé en ce que** l'évaporateur incorpore un ressort (5) situé sur le tube (1), le ressort (5) configurant un circuit hélicoïdal à travers lequel le liquide réfrigérant circule en circulation forcée, et **en ce que** le ressort (5) a un plus petit passage (5a) au début de lui-même, et un plus grand passage (5b) à la fin de lui-même.
2. L'évaporateur pour machine à glace selon la revendication 1, **caractérisé en ce qu'il** incorpore une série de raccords (4) à la fois dans les parties inférieure et supérieure de l'ensemble constitué par les tubes (1, 2).
3. L'évaporateur pour machine à glace selon l'une quelconque des revendications 1 à 2, dans lequel le tube (1) est en acier inoxydable ou en un matériau présentant des caractéristiques mécaniques équivalentes.

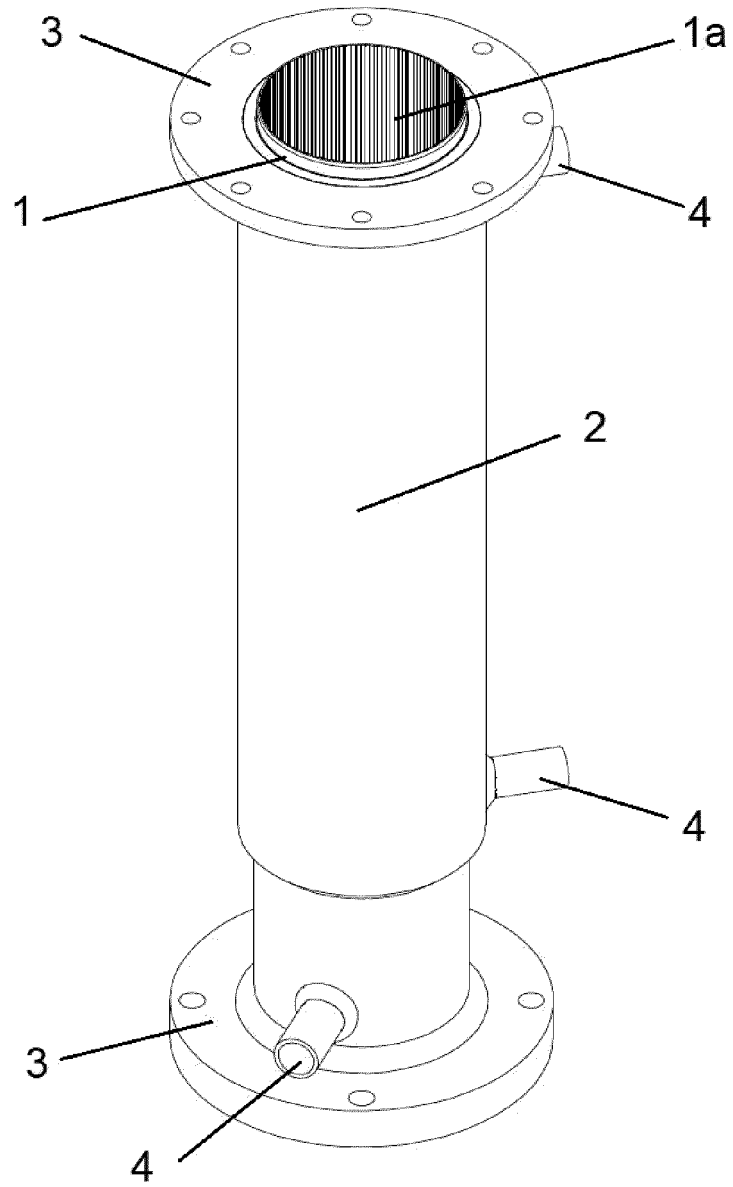


FIG.1

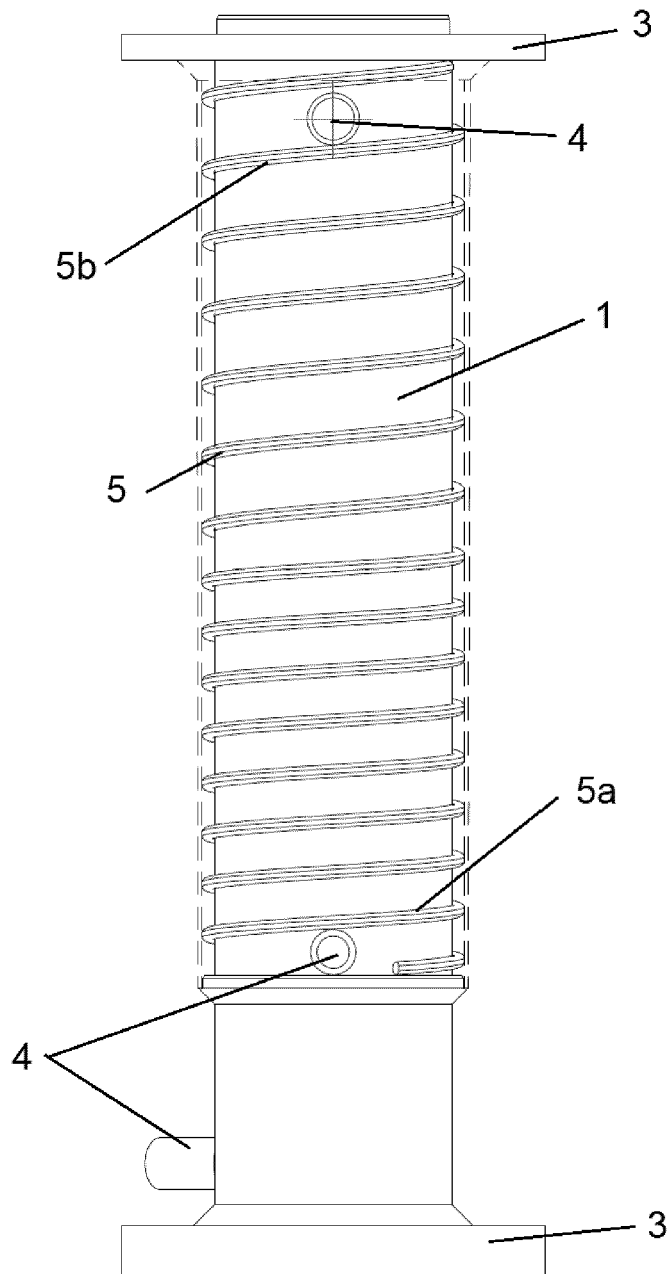


FIG.2

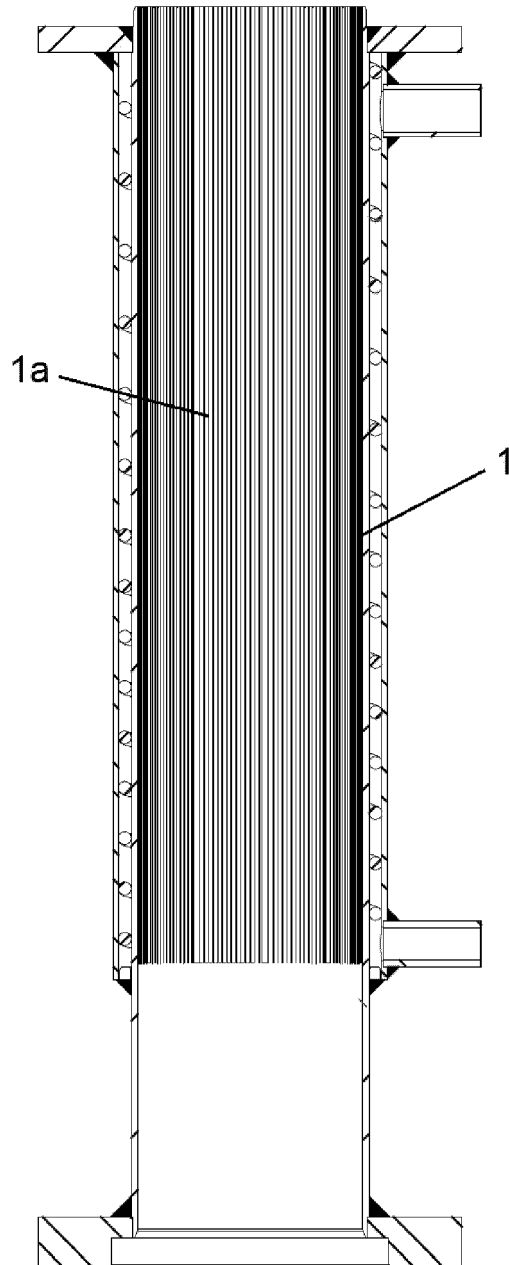


FIG.3

REFERENCES CITED IN THE DESCRIPTION

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