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## Description

The present invention concerns a cooling unit for coffins, of the type using a refrigerating circuit consisting of a compressor, a condenser, one or more expansion or similar valves and an evaporator, which is in a situation of heat exchange with the interior of the coffin.

Similar cooling units are already known and used when it is necessary to delay the final closing of the coffin for whatever reason. In general these units consist of mobile and re-useable units, with an evaporator consisting of a heat exchanger which operates in a situation of heat exchange with the interior of the coffin, which obviously remains closed to prevent losses to the exterior.

It is accepted that the efficiency of these known cooling units has never been completely satisfactory, essentially because the evaporator, which constitutes the cooling element, is located in the coffin in such a way as to limit its range of action and therefore a more powerful cooling circuit is required to fulfill the requirements. Other problems are caused by the fact that when the coffin has to be finally closed all the cooling circuit has to be removed from the coffin and it is necessary to have a perfect seal of that part of the coffin previously occupied by the evaporator.

US-A-3 618 336 shows a cooling coffin structure in which a cooling circuit comprises ducts within the coffin. The circuit contains air moved by a blower.

US-A-4 103 510 describes a portable cooling chest which can be detachably connected to the refrigerating circuit of a car.

With the above as premise, an object of the present invention is a cooling unit of the type and for the application mentioned above, which presents a new and improved configuration, so as to improve the use and efficiency of the same, obtaining the maximum of flexibility of the use with the minimum of costs.

According to the invention, the above object is realized by a cooling unit for coffins, consisting of a refrigerating circuit with a compressor, a condenser, one or more expansion or similar valves and an evaporator in a situation of heat exchange with the interior of the coffin, the evaporator being composed of at least one coil permanently installed in the coffin and pre-charged with refrigeration fluid under pressure, characterized in that said coil is of the disposable type and fitted with rapid attachments for its attachment to the remaining components of the refrigerating circuit and for its disconnection from those said components when the cooling is interrupted, in that said coil is a flat coil (roll-bond) and in that said flat coil is incorporated into a coffin lining or a winding sheet.

In other words, the cooling unit according to the invention consists of two parts, one part composed of all the components a refrigeration circuit, to be eventually contained in a transportable container, and the other part consisting only of the evaporator, which is connected to the remaining parts to close the refrigeration circuit but which is detachable from them and constitutes a disposable element along with the coffin. The other components of the refrigeration circuit can be afterwards connected to another evaporator permanently connected to another coffin.

It is to be pointed out that the evaporator embedded in a flat sheet allows to use the same for refrigerating the corpse without involving any modification of the coffin structure, which can be of any usual type. Before the present invention, no document suggested to refrigerate a corpse in a coffin without modifying the coffin structure, but simply utilizing a flexible refrigerating sheet which can be applied to the coffin just before or even after putting the corpse therein. Moreover, US-A-4 103 510 does not suggest to use the same refrigerating not-disposable circuit (compressor, condenser, expansion valves) with different, disposable evaporator coils.

According to the invention, it is possible to have optimum cooling conditions inside the coffin because the cooling coil can be located in optimum position, and there exist no problems about the closure of the coffin when the components of the refrigeration circuit, with the exception of the evaporator, are detached, because it is simply a matter of disconnecting the rapid attachment connectors and of providing for the sealing of the same in the coffin.

Since the attachment and disconnection of the rapid attachment connectors always involves a loss, however small, of refrigeration fluid, generally freon, the components of said circuit which operate on a new evaporator should include a tank, containing freon under pressure, which allows the loss to be compensated. The tank should be large enough for at least a certain number of operations.

The aforesaid is illustrated schematically in the single drawing attached.

With reference to that drawing, a refrigeration circuit of the classic type is shown consisting of a compressor 10 which sends the gas along the pipe 11 to the condenser 12, which can be cooled by a fan 13. The liquid obtained from the condenser 12 is collected in a tank 14 and sent along the pipe 15 to an expansion valve 16 which in its turn sends the expanded and cooled gas along the pipe 17 to the evaporator, from where the gas returns along the pipe 18 once again to the compressor 10. All the components of the refrigeration circuit could be enclosed in a container 19 and be made transport-

able.

The pipes 17 and 18, respectively the delivery and return of the expanded gas, end in the rapid attachments 20 and 21, of a type already known, which are able to guarantee the seal on the pipes 17 and 18 conserving the pressure in the tract of circuit which goes from one to the other of the said rapid attachments.

Corresponding to the attachments 20 and 21 are attachments 22 and 23, which can be connected or disconnected to the former, connected respectively to a delivery pipe 24 and a return pipe 25 for the same refrigerating fluid, in general freon, which is made to circulate in an evaporator consisting of a cooling coil 26 fed from the delivery 24 and from which the fluid leaves through the return pipe 25.

The pipes 24 and 25 and the coil 26 are themselves filled with the refrigerating fluid under pressure maintained by the attachments 22 and 23. Further, the coil 26 is distributed in the best possible way inside the coffin, for example it is inserted into the lining of the coffin or even in the winding sheet which is used in these cases, or, anyhow, in an element 27 of the coffin very close to the remains.

In any case, the evaporator 26 constitutes a disposable item, which can be connected or disconnected to the other components of the refrigerator circuit, which are re-usable through being connected to another evaporator connected permanently to another coffin, in such a way that those other components can be re-used a number of times, each time serving a new coffin. The highest cost which derives from the substitution of the disposable evaporators is offset by the smaller demands made on the refrigerator circuit, the small size and lower weight, not to mention the ease with which the coffin can be closed when the cooling unit has been disconnected.

## Claims

1. A cooling unit for coffins, consisting of a refrigerating circuit (10-16) with a compressor (10), a condenser (12), one or more expansion or similar valves (16) and an evaporator in a situation of heat exchange with the interior of the coffin, the evaporator being composed of at least one coil (26) permanently installed in the coffin and pre-charged with refrigeration fluid under pressure, characterized that said coil (26) is of the disposable type and fitted with rapid attachments (20-23) for its attachment to the remaining components (17-18) of the refrigerating circuit (10-16) and for its disconnection from those said components (17-18) when the cooling is interrupted, in that said coil (26)

is a flat coil (roll-bond) and in that said flat coil is incorporated into a coffin lining (27) or a winding sheet.

2. A cooling unit according to Claim 1, characterized in that the refrigerating circuit includes a tank (14) for the fluid used in the cycle, so as to compensate for the losses during the connection and disconnection of various disposable evaporators.

## Revendications

1. Unité de refroidissement pour cercueils comportant un circuit de réfrigération (10-16) avec un compresseur (10), un condenseur (12), une ou plusieurs soupapes (16) d'expansion ou analogues et un évaporateur en situation d'échange thermique avec l'intérieur du cercueil, l'évaporateur étant composé d'au moins un serpentin (26) disposé en permanence dans le cercueil et pré-rempli d'un fluide de réfrigération sous pression, caractérisée en ce que ledit serpentin (26) est de type jetable et muni d'attaches rapides (20-23) pour son raccordement aux autres composants (17-18) du circuit de réfrigération (10-16) et pour son détachement desdits composants (17-18) lorsque le refroidissement est interrompu, que ledit serpentin (26) est un serpentin plat (procédé dit de "roll-bonding") et en ce que ledit serpentin est incorporé dans un garnissage de cercueil (27) ou une feuille à enroulement.
2. Unité de refroidissement selon la revendication 1, caractérisée en ce que le circuit de réfrigération comporte un réservoir (14) pour le fluide utilisé dans le cycle, de manière à compenser les pertes pendant la connection et le détachement des différents évaporateurs amovibles.

## Patentansprüche

1. Kühleinheit für Särge, bestehend aus einem Kühlkreis (10-16) mit einem Kompressor (10), einem Kondensator (12), einem oder mehreren Expansionsventilen oder ähnlichen Ventilen (16) und einem Verdampfer in einem Wärmeaustauscherzustand mit dem Inneren des Sarges, wobei der Verdampfer aus wenigstens einer Schlange (26) besteht, die permanent im Sarg eingebaut ist und mit Kühlfliuid unter Druck vorbeaufschlagt ist, dadurch gekennzeichnet, daß diese Schlange (26) vom Wegwerftyp ist und mit Schnellanschlüssen (20-23) für ihre Befestigung an die verbleibenden Komponenten (17-18) des Kühlkreislaufes (10-16) und für deren Trennung von diesen Kom-

ponenten (17-18), wenn die Kühlung unterbrochen wird, ausgestattet ist; daß diese Schlange (26) eine flache Schlange (Roll-Bond) ist und daß diese flache Schlange eingebaut ist in eine Sargauskleidung (27) oder ein Wickeltuch.

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2. Kühleinheit nach Anspruch 1, dadurch gekennzeichnet, daß der Kühlkreislauf einen Tank (14) für das im Kreislauf verwendete Fluid umfaßt, derart, daß Verluste während des Anschlusses und der Trennung verschiedener Wegwerfverdampfer kompensiert werden.

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