Lid (3) for an insulated box (2), with a cooling element (8) that forms part of the lid (3), whereby this cooling element (3) is filled with coolant that is intended to be cooled or frozen in order to then perform a cooling function.
LID FOR INSULATED BOX AND METHOD FOR STORING PRODUCTS

[0001] The present invention relates to a lid for an insulated box and a method for storing products.

[0002] It is known to temporarily store products that have to be kept cooled in an insulated box, that is closed by means of a lid, in which box there is a cooling element that has been cooled or frozen beforehand. This is done in order to transport such products without them warming up, for example.

[0003] Here a box is considered as a general term for a broad range of roughly rectangular storage means, which in principle are intended to be carried by a person and which can be constructed as a bin or crate, for example in plastic.

[0004] The products concerned are for example frozen products, meat products, dairy products, medicines, flowers and vegetables.

[0005] A cooling element for use with such a box is typically a closed casing, in which a coolant, for example water, is introduced. This cooling element is cooled or frozen before use. During use the cooling element, together with the products to be cooled, is placed in the insulated box such that the content of the box can remain sufficiently cool for a long time, typically around ten hours, and this also due to the good insulation of the box and the lid.

[0006] Different types of cooling elements are hereby known, which are designed to maintain a certain temperature interval during use. This means that these cooling elements are designed to be able to absorb or give off more energy for a given temperature change in the specific temperature interval than outside the specific temperature interval. These cooling elements differ essentially from one another due to the formulation of the coolant.

[0007] It goes without saying that all these elements, if they are cooled to a temperature that is low enough, can perform a cooling function at all temperatures that are higher than the said temperature.

[0008] The difference between the various types is that with a mutually equal total cooling capacity, the quantity of heat that a cooling element can absorb in the specified temperature interval concerned is greater than with a cooling element of a different type, i.e. a cooling element optimised for a different temperature interval.

[0009] The cooling elements are normally separate from the box, because it is then the easiest to compactly cool or freeze them again in a cooling or freezing device for reuse.

[0010] However, such boxes have a number of disadvantages that primarily show up in industrial practice. This primarily concerns the risk of mistakes that can be made, and the lack of possibilities to ascertain them.

[0011] Thus it can happen that no cooling elements or too few cooling elements are accidentally placed in a box by somebody who places a product in the box and then closes the box.

[0012] It can also happen that somebody is confused by the presence of cooling elements for different temperature intervals, so that incorrect cooling elements are accidentally used that are not suitable or less suitable for the product concerned.

[0013] These mistakes cannot be observed, and thus cannot be rectified, after the box has been closed.

[0014] A further disadvantage is that placing the cooling elements is labour intensive.

[0015] The cooling elements also take up space that could otherwise be usefully used, and they can move in the box, for example during transport of the box, and thereby can damage themselves, the box and/or the product placed in it.

[0016] An uneven distribution of cooling function over the volume of the box can occur relatively easily.

[0017] The purpose of the present invention is to provide a solution to the aforementioned and other disadvantages, by providing a lid for a box, preferably an insulated box, with a cooling element that forms part of the lid, whereby this cooling element is filled with coolant that is intended to be cooled or frozen in order to then perform a cooling function, whereby the cooling element forms a permanent part of the lid.

[0018] This means that the cooling element is integrated in the lid and that the lid and the cooling element are not intended or suitable for the regular removal of the cooling element from the lid, although there can be a possibility to take the cooling element out of the lid, for example to replace a damaged cooling element.

[0019] As a result the number of actions for the cooled packaging of products is reduced, because no step is necessary to place cooling elements in the box because they are necessarily present when the lid is put on.

[0020] Also the risk of mistakes is hereby reduced, because in principle the cooling elements can never be taken out of the lids.

[0021] Normally this is a passive cooling element, i.e. a cooling element without a connection to an energy source. Alternatively, the cooling element could also be an activatable cooling element, i.e. a cooling element with different compartments with different chemicals which, when they are brought together, for example by breaking a partition, absorb energy from the environment and thereby perform a cooling function.

[0022] In a preferred embodiment, the cooling element is designed to perform its cooling function in a certain temperature interval, whereby the lid is provided on its outside with a mark or a colour that is an indication of the temperature interval for which the cooling element is designed.

[0023] Hereby an identification legend must of course be agreed and used to link a specific mark or colour to a specific temperature interval.

[0024] In this way a suitable cooling element, on the basis of the optimum storage conditions of the product that has to be stored, is identified more easily because the different types are easy to distinguish from one another.

[0025] As a result, the risk of mistakes relating to the use of the correct type of cooling element is reduced.

[0026] The invention also concerns a combination of a lid, as described above, and a box, preferably an insulated box, on which the lid fits.

[0027] Preferably, the lid is a lid with a mark or colour to indicate the optimum temperature interval of the cooling element, whereby a mark corresponding to the mark of the lid is affixed on the outside of the box, or whereby the outside of the box is made in a colour corresponding to the outside of the lid.

[0028] As a result the risk of mistakes is further reduced because a clearly affixed mark or specific colour on the box is easily recognisable.

[0029] Preferably this concerns two or more of the said combinations whereby a first type of lid has a cooling element that is designed for a first temperature interval and a second type of lid has a cooling element that is designed for a second temperature interval.
This has the advantage that in a situation in which products with different optimum temperatures have to be packed, the risk of mistakes is lower because only the colour or mark on the box, which is easy to observe even for somebody who has no product knowledge, determines which lid, and thereby which type of cooling element, has to be used.

Moreover, a subsequent check for correctness is very simple.

The invention also concerns a method for the cooled storage and/or transport of products, whereby the products can include products of a first type that are intended to be stored at a temperature in a first temperature interval, and products of a second type that are intended to be stored at a temperature in a second temperature interval, characterised in that use is made of two or more of the above combinations of box and lid, whereby the lids are stored at a suitable temperature for sufficiently long in order to cool the cooling elements sufficiently, whereby the following steps are completed for each product to be stored:

A: the product to be stored is placed in a box,
B: a lid is selected on the basis of correspondence between the mark or the colour of the lid and the desired temperature interval for the type of product,
C: the selected lid is used to close the box.

Preferably use is made of two or more combinations, whereby the following step is implemented for step A:

A box is selected on the basis of correspondence between the mark or the colour and the desired temperature interval for the type of product, whereby this box is used in step A.

Indirectly by selecting a lid on the basis of correspondence between the mark or the colour of the lid and the mark or the colour of the box.

These methods have the advantage that they can be implemented entirely or partially by people without knowledge of the desired cooling temperature for the various products, and that the risk of mistakes, as discussed in detail above, is thereby very low.

With the intention of better showing the characteristics of the invention, a preferred embodiment of a lid and combination according to the invention is described herein after by way of an example, without any limiting nature, with reference to the accompanying drawings, wherein:

FIG. 1 schematically shows a perspective view of a combination according to the invention;
FIG. 2 shows a cross-section according to line II-II of a component of the combination of FIG. 1;
FIG. 3 shows a cross-section according to line III-III of another component of the combination of FIG. 1;
FIG. 4 shows a cross-section of the combination of FIG. 1 in a state of use.

The combination 1 shown in the drawings comprises an insulated box 2 and a lid 3 that fits on the insulated box 2.

The box 2 is double-walled and made of plastic. The space 4 between the walls 5 is filled with an insulating foam.

The plastic from which the walls 5 are made forms, on the top edge of the box 2, two lips 6 with a widening 7, that are somewhat elastic due to the nature of the plastic.

The outside of the box 2 is blue.

The lid 3 is also double-walled and filled with foam. Two cooling elements 8 are affixed in the lid 3 against the bottom wall 9 of the lid, i.e. the wall that is turned towards the box 2 when the box 2 is closed by the lid 3. The lid 3 is in the same shade of blue.

The lid 3 is narrowed on its underside such that this narrowed part 10 fits in the box 2. The lid 3 is provided with two cutaways 11 on its top at positions corresponding to the lips 6 on the box 2.

The cooling elements 8 are designed to maintain a temperature of approximately −23° C. The use of the lid 3 and the box 2 is simple and as follows.

This use takes place at a location where many different products must be packed, for example to be transported to an end user.

These products are to be classified on the basis of three different types, i.e. a first type of product, for example frozen foodstuffs, that must be stored at a temperature below −10° C, a second type of product, for example fresh meat or meat products, that must be stored at a temperature between 0° C and 4° C, and a third type of product, for example fresh vegetables, that must be stored at a temperature of 10° C to 15° C.

The blue boxes 2 and blue lids 3 described above are present at the location. There are also yellow boxes 2, yellow lids 3, green boxes 2 and green lids 3. Apart from their colour, the yellow boxes 2 and green boxes 2 are identical to the above-mentioned blue boxes 2.

The yellow lids 3 and the green lids 3, in addition to a different colour, also have different types of cooling elements 8 to the blue lids 3. More specifically, the green lids 3 have cooling elements 8 that are designed to maintain a cooled temperature of around 10° C, and the yellow lids 3 have cooling elements 8 that are designed to maintain a cooled temperature just above 0° C.

The lids 3 are cooled in an industrial freezing installation or cooling installation until the cooling elements 8 in the lids 3 are at the right temperature, i.e. have been cooled to a temperature that enables them to optimally fulfill their cooling function. Normally a period in a cooling or freezing installation specified by the supplier is adhered to for this purpose, whereby this period is determined by the supplier on the basis of tests.

Then the packing of the products is started. The lids 3 are hereby made ready for the people who implement this process.

Depending on the circumstances, and the expected quantity of required lids 3, this can mean that they are ready in a cooling or freezing device, or that they are all together close to the location concerned. An intermediate form is also possible whereby a partial stock stands ready at the location, whereby this partial stock is regularly supplemented from a cooling or freezing device.

A first product is now taken. If this is a product of the first type, it is placed in a blue box 2. If it is a product of the second type, it is placed in a yellow box 2. If it is a product of the third type, it is placed in a green box 2. It goes without saying that, instead of one product, a number of products of the same type can also be placed in the same box 2 simultaneously or after one another.

In order to facilitate this, information signs are present at the location that clearly indicate which type of product must be placed in which colour of box 2.

Then the box 2 is closed with a lid 3, whereby only the colour of the box 2 needs to be checked and a lid 3 of the
same colour has to be taken. Hereby the colour of the lid 3, and as a result the temperature for which the cooling elements 8 are designed, is selected, indirectly via the colour of the box 2, on the basis of the type of product.

[0063] When closing, the lips 6 of the box spring somewhat outwards, until the widenings 7 of these lips come into the cutaways 11 in the lid 3, such that the box 2 is properly closed.

[0064] It is now certain that the closed combination 1 of box 2 and lid 3 is provided with cooling elements 8 and that these cooling elements 8 are of the right type. This is achieved in a very low number of operations.

[0065] The closed box 2, as shown in FIG. 4 for example, is now ready for shipping. The box shown in FIG. 4 is filled with sausages 12. The box 2 and lid 3 are yellow.

[0066] The sausages 12 are hereby kept cool because the bottom wall 9 of the lid 3 does not form a significant thermal barrier, so that the cooling elements 8 can perform their cooling function well, while the insulating foam ensures that heat from outside the box 2 can only penetrate the box 2 slowly.

[0067] The box 2 and the lid 3 can be reused after the product 12 has been delivered to the recipient, whereby the lid 3 is again placed in the cooling or freezing installation for a sufficient time, after which it is again ready for use.

[0068] It goes without saying that instead of the said colours, other colours or other marks can also be used, whereby it also goes without saying that these marks are preferably as clear as possible.

[0069] The method can also be implemented in steps, in which in a first step an employee with product knowledge places the products in the boxes 2 belonging to the product type, and in a second step an employee without product knowledge provides the boxes 2, on the basis of the colour, with a lid 3 with a corresponding colour.

[0070] The first step can also be implemented at different locations, whereby only products of a certain type are placed in the boxes 2 at each location, so that only boxes 2 of the colour corresponding to that type are necessary at this location.

[0071] The cooling or freezing device in which the lids 3 with the cooling elements 8 are cooled can be the same for each colour of lid 3, but separate devices with different temperatures can also be used for this purpose. This choice depends on what types of cooling elements 8 are used, and what cooling they necessarily or preferably have to undergo, in order to be able to perform their cooling function sufficiently or optimally.

[0072] Although a lid with two cooling elements is shown above as an example, such a lid according to the invention can of course also be provided with only one cooling element, or with a number of cooling elements greater than two.

[0073] The present invention is by no means limited to the embodiment described as an example and shown in the drawings, but a lid and a method according to the invention can be realised in all kinds of forms and variants, without departing from the scope of the invention.

1. Lid for an insulated box, with a cooling element that forms part of the lid, whereby this cooling element is filled with coolant that is intended to be cooled or frozen in order to then perform a cooling function, characterised in that the cooling element is a passive cooling element that forms a permanent part of the lid.

2. Lid according to claim 1, characterised in that the material or materials from which the lid is made is such that the coolant is not visible.

3. Lid according to claim 1, characterised in that the cooling element is designed to perform its cooling function in a certain temperature interval, whereby the lid is provided on its outside with a mark or a colour that is an indication of the temperature interval for which the cooling element is designed.

4. Combination of a lid according to any one of the previous claim 1 and a box on which the lid fits.

5. Combination of a lid according to claim 3 and a box on which the lid fits, characterised in that a mark is affixed on the outside of the box that corresponds to the mark on the lid or that the outside of the box is made in a colour that corresponds to the outside of the lid.

6. Two or more combinations according to claim 4, whereby a first type of lid has a cooling element that is designed for a first temperature interval and a second type of lid has a cooling element that is designed for a second temperature interval.

7. Two or more combinations according to claim 4, whereby a first type of lid has a cooling element that is designed for a first temperature interval and a second type of lid has a cooling element that is designed for a second temperature interval and whereby the first of the lids and the second of the lids have the same shape.

8. Method for the cooled storage and/or transport of products, whereby the products can include products of a first type that are intended to be stored at a temperature in a first temperature interval, and products of a second type that are intended to be stored at a temperature in a second temperature interval, characterised in that use is made of two or more combinations according to claim 4, whereby the lids are stored at a suitable temperature for sufficiently long in order to cool the cooling elements sufficiently, whereby the following steps are completed for each product to be stored: A: the product to be stored is placed in a box; B: a lid is selected on the basis of correspondence between the mark or the colour of the lid and the desired temperature interval for the type of product; C: the selected lid is used to close the box.

9. Method according to claim 8, characterised in that use is made of two or more combinations, whereby for step A the following step is implemented: a box is selected on the basis of correspondence between the mark or the colour of the box and the desired temperature interval for the type of product, whereby this box is used in step A, whereby optionally step B can be implemented indirectly by selecting a lid on the basis of correspondence between the mark or the colour of the lid and the mark or the colour of the box.