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(54) **PACKAGING ASSEMBLY**
VERPACKUNGSANORDNUNG
ENSEMBLE D'EMBALLAGE

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Description

[0001] The present invention relates to a packaging assembly comprising a rigid outer package with a bottom and walls and a flexible inner package placed therein, wherein the walls and/or the bottom of said outer package and said flexible inner package are provided with openings, wherein the total surface area of the openings in the bottom and/or walls of said outer package is greater than the total surface area of the openings in said inner package.

[0002] Such a packaging assembly is generally known in the prior art. For example, lily bulbs are packaged in film bags which film bags are placed in crates. These crates have relatively large openings in the walls and bottom (slatted crates), whereas the film bags are provided with small openings with a diameter of about 5 mm (round). Transport and storage take place at a few degrees centigrade below zero.

[0003] Such a package is adequate for the transport and storage of lily bulbs. The surface area of openings in a bag for lily packages amounts to less than 0.5% of the total surface area of such a flexible inner package.

[0004] For the packaging of other plants, other packages are proposed in the prior art. Special boxes have been designed for example for the packaging of peppers.

[0005] If peppers for example are packaged for a long time in a box, problems arise in connection with so-called ripening-off and moisture. As a result it is only possible to keep ripe (i.e. not green) peppers for a long time in a package, but even so there is the problem of premature rot. Green peppers cannot be stored for a long time in this way at all.

[0006] It is the object of the present invention to provide a packaging assembly for plants such as peppers with which it is possible to store such plants longer in the package, as a result of which they can be transported over longer distances by ship instead of by aeroplane. More particularly it is an object of the present invention to provide a packaging system which provides optimal protection of the product to be packaged therein at relatively low costs.

[0007] This aim is realised in a packaging assembly described above in that the openings in the inner package each have a surface area of 0.75-5 cm².

[0008] Such a packaging assembly is in particular suitable for the packaging of peppers. The openings proposed according to the invention are very much bigger than the openings used in the prior art mentioned above. This has the result that unlike the prior art there is very good aeration of the plant in the package. That means that good aeration of the plant can be guaranteed even if the packages are placed out of line on a pallet. Depending on the plant, the atmosphere (microclimate) to which the plant is exposed will be adjusted gradually (within a day). On the other hand, the openings in the flexible inner package are of such limited size that there is no great loss of moisture, i.e. the product does not dry

out.

[0009] Furthermore it is possible with the present package to provide very rapid cooling of the plant. That means that directly after harvesting and packaging the plant is put in a cold store and rapid cooling of the plant to the desired temperature can be achieved. It has been found that for certain plants such as peppers the rapid attainment of the desired storage temperature has a major effect on storage life. In research it has been found that if from the time of picking the desired storage temperature is attained one hour faster, the storage life of the pepper in the package is lengthened by about one day. An optimal storage temperature for peppers is between 6 and 8°C.

[0010] It has been found that when stacked on pallets transport of air or other gas present in the space in question takes place through flexible bags and not mainly past them. Optimal filling of the outer package is thus possible without this having any effect on the aeration in the flexible inner package.

[0011] According to an advantageous embodiment of the invention, the total surface area of the openings of the outer package is between 8 and 50% of the total surface area of the walls and bottom of the rigid outer package. More particularly, the surface area of the openings of the outer package is between 30 and 50% of the total surface area. For the flexible inner package a value of less than 15% and more than 1% is applicable for all peppers for example. More particularly a range between 1 and 10% is applicable. As an example, 200 holes each with a diameter of 1.5 cm are made in the flexible inner package. This is in a bag which is suitable for being placed in a crate with dimensions of 60 x 40 x 20 cm.

[0012] According to a further advantageous embodiment of the invention, the inner package is provided with means for absorption of ethylene. In this way the storage life of the plants can be improved and more particularly the rotting process can be counteracted. In order to prevent damage to the plant during filling of the inner package and during transport, the inner package can be shock-absorbent, e.g. it can consist of bubble film.

[0013] It has been stated above that the inner package preferably comprises a bag. It is also possible, however, to start with a sheet of plastic film and to fold this over. Complete sealing is not necessary and, in view of the openings present in the inner package described above, also not relevant.

[0014] The invention also relates to a method for harvesting peppers, comprising picking said peppers and packaging them within 24 hours in an assembly as described above, with said peppers being kept for at least a week in said package. In particular the peppers are yellow peppers.

[0015] The invention will be made clearer by means of an example illustrated in the drawing. In this the only figure shows schematically a packaging assembly according to the present invention.

[0016] This packaging assembly is generally referred

to by 1 and consists of an outer package 2 which in this example is in the form of a slatted crate. Such a slatted crate can consist of plastic and has a relatively large area of openings. This slatted crate can furthermore be in collapsible form. It is then possible to make the slatted crate non-returnable. Another possibility is to sell the slatted crate after use. It will be understood that cardboard boxes provided with an adequate opening area or other packaging can also be used instead of a plastic slatted crate. [0017] The walls of the slatted crate are indicated as 3 and the bottom as 4.

[0018] On the bottom a bag 5 is placed, consisting of a plastic film such as HDPE. Peppers 7 are packaged therein. The bag 5 is provided with about 200 circular openings with a diameter of 15 mm. It will be understood that these openings can have another shape, such as slot-shaped, and that the diameter thereof can vary somewhat, lying between 10 and 25 mm.

[0019] It has been found that a package as described above is suitable in particular for the packaging of peppers. It has been found that there is hardly any deterioration in the quality of the packaged product after a prolonged period, such as one week. As a result it is also possible to store/transport yellow peppers for a prolonged period.

[0020] During a trial it has been found that a weight loss of 1% occurs during storage for thirteen days if yellow peppers in a film as described above are packaged in the outer package described above. This is in contrast to a weight loss of 3% in the case of an ordinary box known in the prior art.

[0021] It will be understood that the number of openings and the circumference thereof will be adapted to the product to be packaged, the time that the product is expected to remain in the package, and the conditions during this time.

[0022] Such adaptations are obvious to persons skilled in the art after reading the above description and fall within the scope of the appended claims.

Claims

1. Packaging assembly (1) comprising a rigid outer package (2) with a bottom (4) and walls (3) and a flexible inner package (5) placed therein, wherein the walls and/or the bottom of said outer package and said flexible inner package are provided with openings (6), wherein the total surface area of the openings in the bottom and/or walls of said outer package is greater than the total surface area of the openings in said inner package, **characterized in that** said openings in said inner package each have a surface area of 0.75-5 cm².
2. Packaging assembly according to Claim 1, where the total surface area of said openings in the bottom and/or walls of said outer package is more than 8%

of the total surface area of said bottom and/or walls of said outer package.

3. Packaging assembly according to one of the preceding claims, where the total surface area of said openings in said inner package is 1-15% of the total area of said inner package.
4. Packaging assembly according to one of the preceding claims, where said inner package comprises a plastic film material.
5. Packaging assembly according to one of the preceding claims, where said inner package comprises a bag.
6. Packaging assembly according to one of the preceding claims, where said outer package comprises a slatted crate.
7. Packaging assembly according to one of the preceding claims, where said inner package is provided with means for absorption of ethylene.
8. Packaging assembly according to one of the preceding claims, where said inner package is a shock-absorbent package.
9. Method for harvesting peppers, comprising picking said peppers and packaging them within 24 hours in a system according to one of the preceding claims, where said peppers can be kept for at least one week in said package.
10. Method according to Claim 9, where said peppers are yellow peppers.

Patentansprüche

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1. Verpackungsanordnung (1) mit einer festen Außenverpackung (2) mit einem Boden (4) und Wänden (3) und einer darin platzierten flexiblen Innenverpackung (5), wobei die Wände und/oder der Boden der Außenverpackung und der flexiblen Innenverpackung mit Öffnungen (6) versehen sind, wobei die Gesamtfläche der Öffnungen in dem Boden und/oder den Wänden der Außenverpackung größer als die Gesamtfläche der Öffnungen in der inneren Verpackung ist, **dadurch gekennzeichnet, dass** jede Öffnung in der inneren Verpackung eine Fläche von 0,75-5 cm² aufweist.
2. Verpackungsanordnung nach Anspruch 1, wobei die Gesamtfläche der Öffnungen in dem Boden und/oder den Wänden der Außenverpackung mehr als 8% der Gesamtoberfläche des Bodens und/oder der Wände der Außenverpackung ist.

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| <p>3. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Gesamtfläche der Öffnungen in der Innenverpackung 1-15% der Gesamtfläche der Innenverpackung ist.</p> <p>4. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Innenverpackung ein Kunststofffolienmaterial umfasst.</p> <p>5. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Innenverpackung einen Beutel umfasst.</p> <p>6. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Außenverpackung eine Lattenkiste umfasst.</p> <p>7. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Innenverpackung mit Mitteln zur Absorption von Ethylen versehen ist.</p> <p>8. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei die Innenverpackung eine stoßabsorbierende Verpackung ist.</p> <p>9. Verfahren zum Ernten von Paprikaschoten, das das Pflücken der Paprikaschoten und das Verpacken dieser innerhalb 24 Stunden in ein System nach den vorstehenden Ansprüche umfasst, wobei die Paprikaschoten für zumindest eine Woche in der Verpackung aufbewahrt werden können.</p> <p>10. Verfahren nach Anspruch 9, wobei die Paprikaschoten gelbe Paprikaschoten sind.</p> | <p>5</p> <p>10</p> <p>15</p> <p>20</p> <p>25</p> <p>30</p> <p>35</p> | <p>tions précédentes, dans lequel la surface totale desdites ouvertures dans ledit emballage interne représente 1-15% de la surface totale dudit emballage interne.</p> <p>4. Ensemble d'emballage selon l'une des revendications précédentes, dans lequel ledit emballage interne comprend une matière en film plastique.</p> <p>5. Ensemble d'emballage selon l'une des revendications précédentes, dans lequel ledit emballage interne comprend un sac.</p> <p>6. Ensemble d'emballage selon l'une des revendications précédentes, dans lequel ledit emballage externe comprend un cageot à planchettes.</p> <p>7. Ensemble d'emballage selon l'une des revendications précédentes, dans lequel ledit emballage interne est pourvu de moyens pour l'absorption d'éthylène.</p> <p>8. Ensemble d'emballage selon l'une des revendications précédentes, dans lequel ledit emballage interne est un emballage absorbant les chocs.</p> <p>9. Méthode pour récolter des poivrons, comprenant la récolte desdits poivrons et leur emballage dans les 24 heures dans un système selon l'une des revendications précédentes, dans laquelle lesdits poivrons peuvent être conservés au moins une semaine dans ledit emballage.</p> <p>10. Méthode selon la revendication 9, dans laquelle lesdits poivrons sont des poivrons jaunes.</p> |
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Revendications

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| <p>1. Ensemble d'emballage (1) comprenant un emballage externe rigide (2) avec un fond (4) et des parois (3) et un emballage interne flexible (5) placé à l'intérieur, dans lequel les parois et /ou le fond dudit emballage externe et dudit emballage interne flexible sont pourvus d'ouvertures (6), dans lequel la surface totale des ouvertures dans le fond et / ou sur les parois dudit emballage externe est supérieure à la surface totale des ouvertures dudit emballage interne, caractérisé en ce que lesdites ouvertures dans ledit emballage interne ont chacune une surface de 0,75-5 cm².</p> <p>2. Ensemble d'emballage selon la revendication 1, dans lequel la surface totale desdites ouvertures dans le fond et / ou sur les parois dudit emballage externe représente plus de 8% de la surface totale desdits fond et / ou parois dudit emballage externe.</p> <p>3. Ensemble d'emballage selon l'une des revendica-</p> | <p>40</p> <p>45</p> <p>50</p> <p>55</p> |
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