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(54) **Packaging container, manufacturing method thereof and use in aseptically packaging of products**

(57) The present invention relates to a packaging container (1) for use as packaging in the aseptic packaging of products, in particular (food) products which are susceptible to decay. A packaging container (1) of this nature comprises an outer support container (2) with an open top side (3) and an inner container (4) which is closed on all sides, the inner container (4) being situated at least partially inside the support container (2) and being attached, by means of a peripheral section (5), to the open top side (3) of the support container (2). Between the inside of the support container (2) and the outside of the inner container (4) there is a closed chamber (7). The invention also relates to a method for manufacturing a packaging container of this nature, and to a method for aseptic packaging of products in a packaging container of this nature.

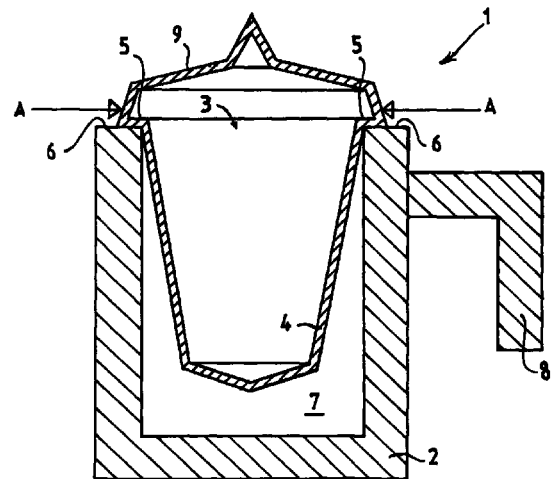


FIG. 1.

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Description

[0001] The present invention relates to a double-walled packaging container for use as packaging in the aseptic packaging of products, in particular products which are susceptible to decay.

[0002] In today's hectic society, also under the influence of constantly progressing individualization, there is a need for food products which are easy to prepare and use and are supplied in disposable packaging. If possible, the packaging itself is used as a container for preparation and consumption. Packaging of this nature is used, for example, for packaging products which are susceptible to decay, such as soups, dairy drinks, baby food and pet food. Usually, the content is sufficient for one person or a small number of people.

[0003] A container for liquid food products which is known from JP-A-63-102935 comprises a double-walled container with an inner container which is made from multiple layers of polypropylene and is attached to the top edge of an outer support container made from propylene polymer containing inorganic filler, so that there is a space which is closed off from the atmosphere situated between the inner container and the support container. After it has been filled with the product, the inner container is sealed with an easy-to-open closure in order to protect the product situated in the inner container from undesirable external influences. This known container is used for packaging food products, such as soups, which are introduced into the inner container, after which the inner container is provided with the easy-to-open closure. Then, the product which has been packaged in this way is sterilized. The specific materials from which this known container is made provide it with a good heat resistance, as is required for (retort) sterilization and heating in a microwave oven, as well as good thermal insulation properties, so that it is easy to handle after heating.

[0004] According to today's state of the art, before containers of this nature are filled their inside has to be thoroughly cleaned and rinsed, which entails high costs, before they can be filled with the product in question. Furthermore, high demands are imposed on the material types and the structure of the containers, in order that they are able to withstand the influences of heat and pressure which occur during the sterilization.

[0005] The object of the present invention is to provide a packaging container which can be used as packaging in the aseptic packaging of products, in particular products which are susceptible to decay, and in which thorough cleaning prior to filling is no longer required, in particular for the inside of the packaging container.

[0006] To this end, the double-walled packaging container according to the invention comprises an outer support container with an open top side and an inner container which is closed on all sides and is made from one piece, the inner container being situated at least partially inside the support container and being

attached, by means of a peripheral part, to the periphery of the open top side of the support container, so that there is a chamber which is closed to the environment located between the inside of the support container and the outside of the inner container.

[0007] The packaging container according to the invention comprises an outer support container, which may adopt all kinds of shapes. An inner container which is closed on all sides is attached to the open top side, with the result that a hermetically sealed space is formed between the inner walls and base of the outer support container and the outside of the inner container. A space of this nature is advantageous for the thermal insulation properties of the packaging container according to the invention, which thermal insulation is advantageous both for products which are to be heated in a microwave oven, for example, and for cooled products, such as dairy drinks. Since the inner container is closed on all sides and is made from a single piece, its inside does not have to be cleaned and rinsed after the inner container has been opened and before it is filled with a product, as will be explained in more detail below. One of the current techniques which can be used for manufacturing closed containers from a single piece, such as the closed inner container, is that of blow-moulding. The outer support container can be produced in a known manner, for example by injection-moulding and the like.

[0008] Since use is made of a closed inner container, it is impossible for any dust, insects or other vermin to nest in the inner container during storage and transportation to the manufacturer where the packaging container is processed further and filled with a certain product.

[0009] Advantageously, the top side of the support container comprises a horizontal peripheral surface, to which a peripheral part of the inner container is attached. Attaching the inner container to the support container in this way is advantageous for the further processing of the packaging container during aseptic packaging, in particular if the top section of the inner container projects above the open top side of the support container, so that this section is easy to remove, as will likewise be explained in more detail below.

[0010] If, once it has been filled, the packaging container according to the invention will also function as a drinking vessel, the inner container is advantageously situated entirely inside the support container and, by means of a peripheral section, is attached to the inside of the support container. After the inner container has been opened and filled, it will be impossible for the user to be hurt by the cut edge of the inner container while he is drinking, since a cut edge of this nature is situated on the inside of the support container.

[0011] This embodiment of the packaging container according to the invention, in which the inner container is situated entirely inside the support container, has the additional advantage that the risk of damage to the inner container, for example during transportation and

storage prior to filling, is low since there are no projecting parts of the inner container. Damage of this nature would affect the sterility of the inner container, which is undesirable. Furthermore, an additional advantage is that this embodiment is easy to stack and therefore to transport.

[0012] Preferably, the inner container is filled with an inert gas or sterilized air while it is being manufactured. Advantageously, the inner container is under excess pressure. This excess pressure provides a simple tool for checking, immediately prior to aseptic packaging, whether the inner container has been damaged during storage and transportation, causing the sterility to be lost.

[0013] Any suitable technique, such as hot-welding or conventional adhesive bonding, can be used to attach the inner container to the outer support container. This partly depends on the materials used for the support container and the inner container. If the product with which the container is to be filled has to be heated in order to be consumed, the packaging material is preferably able to withstand microwave radiation. Preferably, the various components of the packaging container according to the invention are made from plastics material, polyethylene being preferred as the material for the inner container, while (transparent) polyethylene terephthalate is preferred for the outer support container, so that a label or the like can be arranged in the closed chamber which is present between the two containers, on the inside of the outer support container, which label or the like cannot easily be damaged due to its protected position.

[0014] The shape of the support container is not critical, and nor is that of the inner container, provided that they allow a closed chamber to be present between the two containers. This means that every manufacturer of packaged products can select his own shape. Moreover, the shape can be adapted to the packaged product and/or the method of preparation and/or method of consumption. By way of example, for dairy drinks and soups the support container may be provided with a lug. While the shape of the inner container remains constant - in other words if the same blow mould is used for the manufacture of the inner container - various support containers are suitable and can each be manufactured by means of a different production technique. The advantages of this are, inter alia, the considerable freedom to choose both the manufacturing technology and the shape of the support container, also with regard to the production costs.

[0015] The packaging container according to the invention is suitable for many types of products. Specific examples of food products of this nature which may be mentioned are chicken, tomatoes, beans, mushrooms, etc.

[0016] The present invention also relates to a method for the manufacture of a packaging container according to the invention, as defined in claim 9.

[0017] The invention also relates to a method for the aseptic packaging of products in a packaging container according to the invention, which method comprises the following steps, carried out under aseptic conditions:

- c) opening the inner container, so that the inner container becomes accessible,
- d) filling the inner container with the product, and
- e) sealing the inner container using a seal.

[0018] As has been explained above, this packaging method according to the present invention is carried out under aseptic conditions, i.e. there can and must be no contamination to the packaging, in particular the inner container and the product to be packaged, during the opening, filling and sealing. Devices which are suitable for this purpose are available, inter alia, from the present applicant.

[0019] In this method according to the invention, firstly the inner container is opened, preferably by the top section of the inner container being removed, during which process it is ensured that the closed chamber remains intact. In this way, the inner container is made accessible and is then filled with the appropriate product. After the desired quantity has been introduced into the inner container, the top side of the support container and inner container is sealed in a manner which is known per se to those skilled in the art, for example by sealing with a hot-weldable aluminium foil. If desired, a lid, for example a click-on lid, can be placed over this seal, in order to protect the vulnerable seal from damage.

[0020] Preferably, the packaging container according to the invention will undergo a number of preparatory steps, as defined in claim 16, prior to the aseptic filling by the manufacturer. To ensure that the packaging container according to the invention does not contain any contaminants, dust and the like, the outside of the packaging container is preferably cleaned with a sterilizing/disinfecting agent, such as hydrogen peroxide. It is then tested whether the closed inner container has remained leaktight during transportation and/or storage, for example by measuring the pressure in the inner container. If it is found that the excess pressure of the inner container has been lost or is lower than the original pressure applied during blow moulding, the packaging container is unusable and it is removed from the packaging process.

[0021] The removal of the top section of the inner container may be brought about using customary means, such as for example by cutting with a sharp blade.

[0022] It will be understood that the packaging container according to the invention is a product from which an object corresponding to the container in accordance with the above-described Japanese patent application can be manufactured.

[0023] The invention also relates to a closed inner container which is manufactured from a single piece and is suitable for use in the packaging container according to the invention, as defined in claim 19.

[0024] The invention will be explained below with reference to the appended drawing, in which:

[0025] Figures 1-3 show cross sections through various embodiments of a packaging container according to the invention.

[0026] Figure 1 shows a cross section through a first embodiment of a packaging container 1 according to the invention, which comprises an outer support container 2 with an open top side 3, into which an inner container 4, which is closed on all sides and is made from a single piece, has been placed. Using an adhesive bond (not shown), a peripheral part 5 of the inner container 4 is attached to the planar horizontal top edge 6 of the support container 2. Consequently, there is a closed chamber 7, which if desired can be filled with a gas, such as nitrogen or the like, between the support container 2 and the inner container 4. The support container 2 is also provided with a lug 8, making it easier to handle for the final user.

[0027] The closed inner container 4 is made from one piece by means of blow moulding, in which a body in the form of a bag, known as a parison, is blown from a continuous stream of plastics material, the free ends being pressed together and thus sealed at the end of the blowing operation.

[0028] As can be seen clearly from Figure 1, a top section 9 of the inner container 4 projects above the top edge 6 of the support container 2. During the aseptic packaging, this projecting section 9 is cut off along the peripheral edge 5 and 6, so that there remains a good attachment position for a seal which is to be fitted subsequently, after filling, and is not shown in Fig. 1. The cutting points are indicated by arrows A in the figure.

[0029] Fig. 2 shows a second embodiment of a double-walled packaging container according to the invention, the components of which are provided with the same reference numerals as in Fig. 1 + 20. With a view to the ease of stacking and user-friendliness for the final user, the packaging container 21, comprising a support container 22 and inner container 24, does not have any parts which project beyond the contours of the support container 22. The inner container 24 is situated entirely inside the support container 22 and is attached to the inside thereof in the vicinity of the top edge 26. To strengthen the inner container 24, its base 30 is attached to the base 31 of the support container 22 by means of adhesive bonding. A dashed line indicates a seal 32 which, after the top section 29 has been removed and the container has been filled with a product, is used to reclose the packaging container 21. The cutting points are in this case indicated by arrows B.

[0030] Fig. 3 shows a third embodiment of a packaging container according to the invention, the components of which are denoted by the same reference

numerals as in Fig. 1 + 40. In addition to the different shape of both the inner container 44 and the support container 42 and the resultant different attachment of a peripheral section 45 to the open top side 43, in this embodiment support means 53 are provided in the chamber 47, for the purpose of supporting the base 50 of the inner container 44, so that the construction is rigid and strong.

10 Claims

1. Double-walled packaging container (1; 21; 41) for use as packaging in the aseptic packaging of products, in particular products which are susceptible to decay, which packaging container (1; 21; 41) comprises an outer support container (2; 22; 42) with an open top side (3; 23; 43) and an inner container (4; 24; 44) which is closed on all sides and is made from one piece, the inner container (4; 24; 44) being situated at least partially inside the support container (2; 22; 42) and being attached, by means of a peripheral part (5; 25; 45), to the periphery of the open top side (3; 23; 43) of the support container (2; 22; 42), so that there is a chamber (7; 27; 47) which is closed to the environment located between the inside of the support container (2; 22; 42) and the outside of the inner container (4; 24; 44).
2. Packaging container according to claim 1, characterized in that the top side of the support container (2) comprises a horizontal peripheral surface (6), to which a peripheral part (5) of the inner container (4) is attached.
3. Packaging container according to one of the preceding claims, characterized in that the top section (9) of the inner container (4) projects above the open top side (3) of the support container (2).
4. Packaging container according to claim 1, characterized in that the inner container (24) is situated entirely inside the support container (22) and is attached, by means of a peripheral section (25), to the inside of the support container (22).
5. Packaging container according to one of the preceding claims, characterized in that the inner container (4; 24; 44) is attached to the outer support container (2; 22; 42) by means of an adhesive bond.
6. Packaging container according to one of the preceding claims, characterized in that the packaging container (41) is provided with support means (53) for supporting the inner container (44) in the support container (42).
7. Packaging container according to one of the pre-

- ceding claims, characterized in that the inner container (4; 24; 44) is produced by means of blow-moulding.
8. Packaging container according to one of the preceding claims, characterized in that the inner container (4; 24; 44) is filled with an inert gas or sterilized air. 5
9. Packaging container according to one of the preceding claims, characterized in that the inner container (4; 24; 44) is under excess pressure. 10
10. Packaging container according to one of the preceding claims, characterized in that the support container (2; 22; 42) and inner container (4; 24; 44) are made from plastic. 15
11. Packaging container according to one of the preceding claims, characterized in that the support container (2; 22; 42) consists of polyethylene terephthalate. 20
12. Packaging container according to one of the preceding claims, characterized in that the inner container (4; 24; 44) consists of polyethylene. 25
13. Method for manufacturing a packaging container (1; 21; 41) according to one of the preceding claims, which method comprises the steps of providing an outer support container (2; 22; 42), providing an inner container (4; 24; 44), which is closed on all sides and is made from a single piece, and attaching a peripheral part (5; 25; 45) of the inner container (4; 24; 44) to the entire periphery of the open top side (3; 23; 43) of the support container (2; 22; 42), in such a manner that a closed chamber (7; 27; 47) is formed between the inside of the support container (2; 22; 42) and the outside of the inner container (4; 24; 44). 30 35 40
14. Method for the aseptic filling and packaging of products in a packaging container (1; 21; 41) according to one of the preceding claims 1-12, which method comprises the following steps, which are carried out under aseptic conditions: 45
- c) opening the inner container (4; 24; 44), so that the inner container (4; 24; 44) becomes accessible, 50
- d) filling the inner container (4; 24; 44) with the product, and
- e) sealing the inner container (4; 24; 44) using a seal (32). 55
15. Method according to claim 14, characterized in that step c) comprises the removal of the top section (9; 29; 49) of the inner container (4).
16. Method according to claim 14 or 15, characterized in that the method comprises the preparatory steps, carried out prior to step c), of
- a) exposing the packaging container (1; 21; 41) to a sterilizing/disinfecting agent, and
- b) checking the leaktightness of the inner container (4; 24; 44).
17. Method according to one of the preceding claims 14-16, characterized in that the method comprises the additional step of placing a cover over the seal (32).
18. Method according to one of the preceding claims, characterized in that the seal (32) consists of aluminium foil which is hot-welded to the peripheral edge (6; 26; 46) of the top side of the support container (2; 22; 42) and/or the peripheral edge (5; 45) of the inner container (4; 44).
19. Closed inner container (4; 24; 44) which is manufactured from one piece and is suitable for use in a packaging container (1; 21; 41) according to one of claims 1-12.
20. Container according to claim 19, characterized in that the container (4; 24; 44) is filled with an inert gas or sterilized air.
21. Container according to claim 19 or 20, characterized in that the container (4; 24; 44) is under excess pressure.

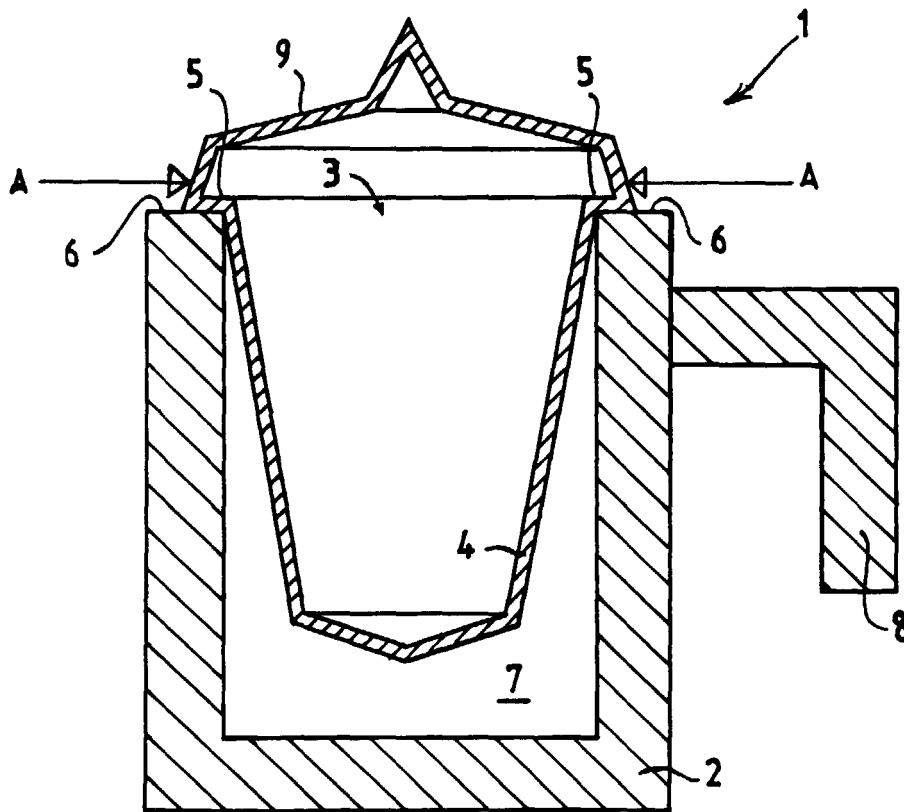


FIG. 1.

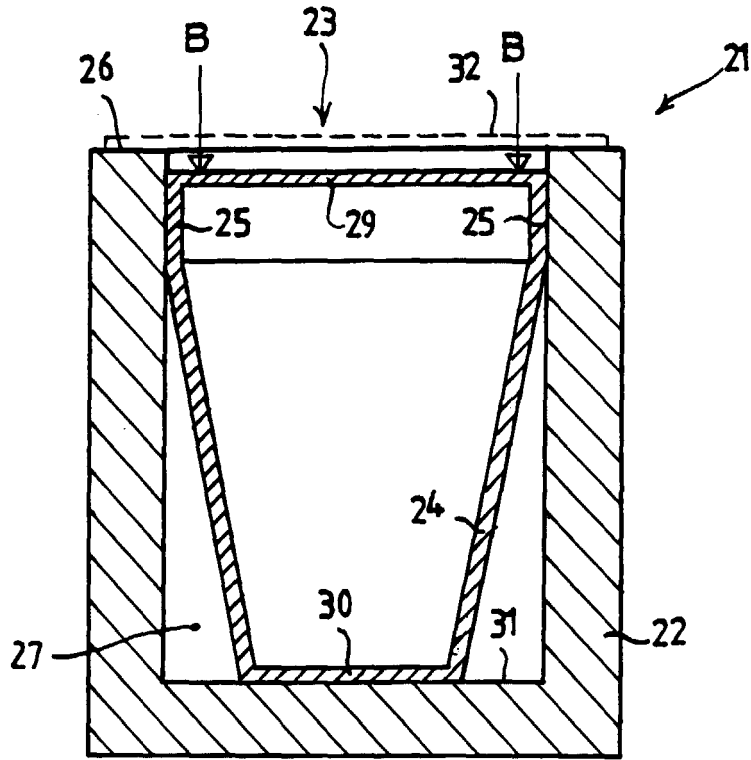


FIG. 2.

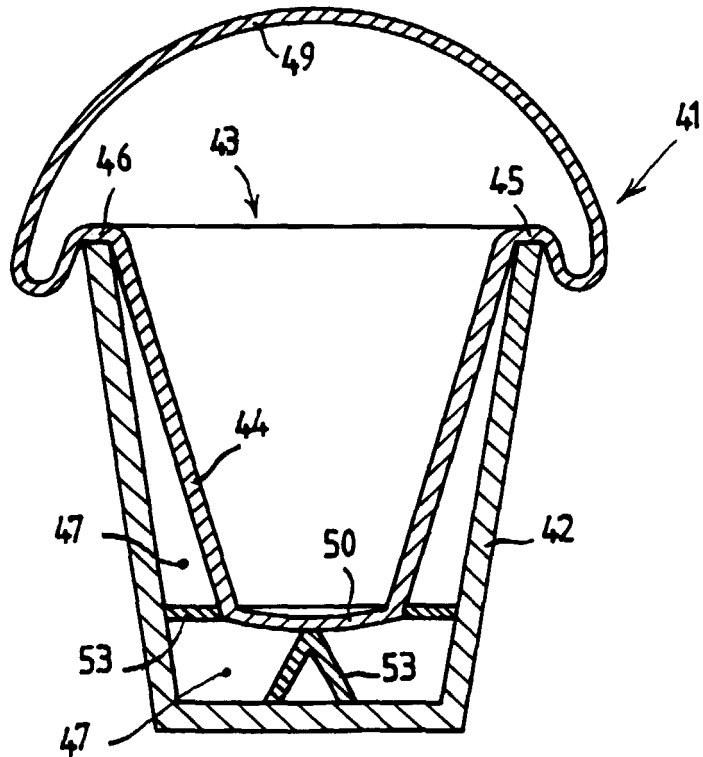


FIG. 3.



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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 1305

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 3 717 274 A (WINGARDH U) 20 February 1973 (1973-02-20) * the whole document * -----	1, 13, 14	B65D77/04
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		18 July 2000	Martin, A
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 20 1305

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-07-2000

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US 3717274 A	20-02-1973	GB 1324660 A	25-07-1973
		US 3889443 A	17-06-1975

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82