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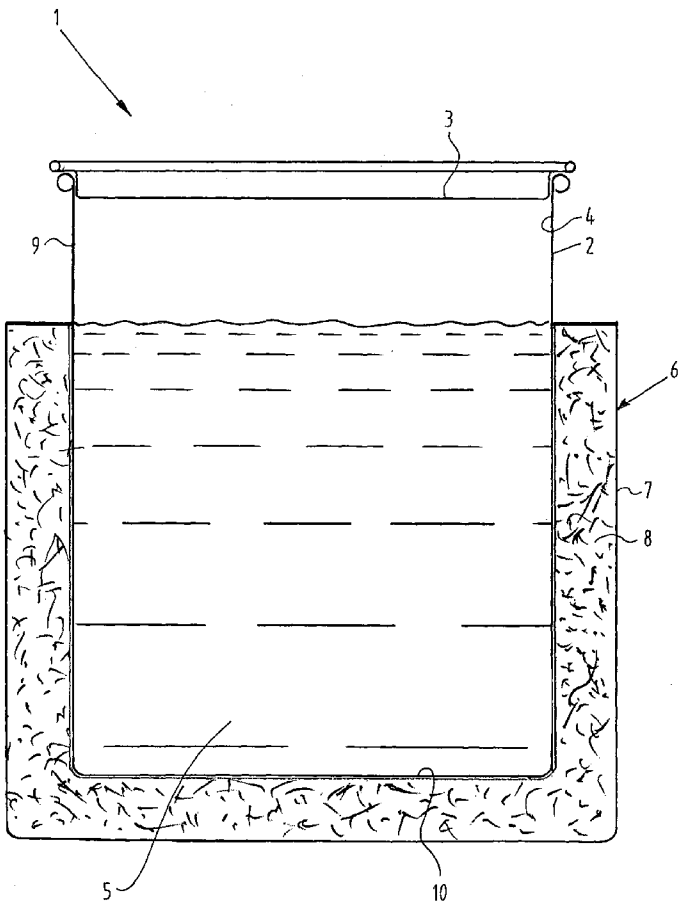
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(54) **Title:** CONTAINER PROVIDED WITH A MICROWAVE HEATABLE ELEMENT



(57) **Abstract:** The invention relates to a container (1, 11, 18, 27) having a body and a closure for an opening in the body, which body comprises a heatable content (5, 19) and, in heat exchange contact, a microwave heatable element (6, 14, 22, 28).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

CONTAINER PROVIDED WITH A MICROWAVE HEATABLE ELEMENT

The present invention relates to a container which is provided in heat exchange contact with a microwave heatable element, and to such element.

Microwave ovens are used for heating food materials which are placed in a container within the microwave oven.

For that reasons the heatable food content is placed in a container which is suitable for microwave heating. If the food material is not placed in a microwave container but heated in the microwave oven in its original container than the heating is not optimal. For reasons, that the microwave heating substantially occurs via the opening in the body of the container after removal of its closure. Microwave heating through the body occurs only to a minor extend. Accordingly, the heating of the hydro content of the container after removal of its closure is sub optimal in that the content in the container is not homogeneously heated.

The present invention has for its object to improve the microwave heating of the content of a container. To that extend the present invention provides a container having a body and a closure for an opening in the body, which body comprises a heatable content and provided in heat exchange contact with a microwave heatable element. The heating of the heatable content of the container is improved because additional heating of the heatable content occurs indirectly. The microwave heatable element is heated and heat is transferred into the content of the container because the

microwave heatable element is in heat exchange content with the body of the container.

In a preferred embodiment the heatable element comprises microwave heatable material contained in an envelope. Accordingly, various microwave heatable materials may be used such as water absorbing materials, such as absorbents used for diapers, and materials which comprise an amount of water which is in equilibrium with humidity, such as cherry pits.

In one embodiment the envelope of the hydro element is a water tight element, such as a plastic, such as polyethylene. The hydro material enclosed in the water tight envelope comprises a sufficient amount of water such that during microwave heating sufficient heat is generated and via the heat exchange contact transferred into the content of the container.

According to another preferred embodiment the envelope of the hydro element is water permeable, such as micro porous plastics used as an inner liner for diapers. Accordingly, just before heating in a microwave oven the hydro element is moistured with water which passes through the water permeable envelope into the water absorbing microwave heatable material. The container comprising this microwave heatable element is than placed for heating in to a microwave oven. Steam generated during the microwave heating is allowed to be released from the heatable element into the interior of the microwave oven.

According to an other preferred embodiment the envelope is semi water permeable, such as a laminated envelope. Before microwave heating the heatable element is moistured with water, which is absorbed by the microwave heatable material. During heating in the microwave oven steam may be produced but the steam cannot be admitted out of the

envelope because the envelope is maid of semi water permeable material.

According to another embodiment of the container according to the present invention the envelope is adhered to the body by the supplier. Accordingly, the costumer may place such container directly in the microwave oven if the microwave heatable material may be heated by microwave directly, or after moistening the heatable material contained in the envelope. After heating and use of the heated content the container with the adhered envelope is disposed.

According to another preferred embodiment the envelope is detachably connected to the body. In this situation the container is connected in heat exchange contact with the microwave heatable element just before it is placed in the microwave oven for heating. Handling by the customer is improved when the envelope may be detachably connected to the body and has the form of a pad which is complementary to at least part of the outer form of the container. Accordingly, the customer just has to place the container into the pad and place the combination of container and microwave heatable element pad into the microwave oven.

According to another preferred embodiment the heatable element extends over a part of the height of the body. In this situation only a part of the height of the body is heated in the microwave oven. After heating the exposed part of the height of the body is not heated such that it may be handled using kitchen gloves or par fingers.

An other aspect of the present invention relates to a microwave heatable element according to the present invention which may be used in combination with a container with which the microwave heatable element is in heat exchange contact such that the content of the container may be heated in a microwave oven.

Mentioned and other features of the container and microwave heatable elements according to the invention will be further illustrated with reference to the annexed embodiments which are illustrated in the annexed drawings. It is to be understood that these embodiments are given for illustrative purposes and are not considered to limit the present invention to any extend.

In the drawings are:

Figure 1 in cross section a container according to the present invention provided with an adhered microwave heatable element;

Figure 2 a side view, partially broken away, of another container provided with a microwave heatable element having a water permeable envelope;

Figure 3 in cross section another container according to the invention provided a detachable element in the form of a pad; and

Figure 4 in cross section an alternative of the embodiment shown in figure 3.

Figure 1 shows in container 1 comprising a body 2 and a closure 3 for a body opening 4. The container 1 comprises a heatable content 5. The body 2 is provided over a part of the height of the body and over its bottom 10 with a microwave heatable element 6 comprising an envelope 7 containing microwave heatable material 8 in the form of an absorbent material provided with water. The envelope 7 is made of water tight plastic, such as polyethylene.

An area 9 of the body 2 is not covered by the microwave heatable element 6.

When a customer is to heat the content 5 of the container 1 and the microwave oven he removes the closure 3 and places the combination of body 2 and adhered microwave heatable element 6 into the microwave oven. Heating occurs

via the opening 4 and after heating the material 8 of the element 6 the heat is transferred due to the heat exchange contact between microwave heatable element 6 and the body 2 into the content 5. Accordingly, the content 5 is substantially heated directly via microwaves via the opening 4 and indirectly via the microwave hydro element 6 of a part of the height and via the bottom 10.

Figure 2 shows another container 11 of the present invention comprising a body 12 and closure 13. The body 12 is over a part of its height provided with a microwave heatable element 14 comprising an envelope 15 which is water permeable (permeability via the openings 16 enlarged for information purposes). The microwave heatable element 14 comprises water absorbent material 17. Prior to heating by the customer the microwave heatable element 14 is moistured with water via the openings 16. Subsequently, the closure 13 is removed in the combination of body 12 and microwave heatable element 14 is placed in the microwave oven. The operation is further similar to that described in relation to the container 1 of figure 1.

Figure 3 shows a container 18 according to the invention provided with a heatable content 19. The body 20 of the container 18 is closed via a foil 21.

The microwave heatable element 22 has the form a pad. This means that the element 22 comprises absorbent material 23 but the envelope 24 is flexible and preformed and has the form of a pad 25 of cub. Prior to the heating of the content 19 of the container 18 the customer places the container 18 into the pad 25 which makes a heat exchange content with substantially the side walls and the bottom. Due to the flexibility of the envelope 24 and its absorbent material 23. The envelope 24 may be water tight or water permeable. In case of water permeability water is entered via the arrows

26. The combination of container 18 and pad 25 is than placed in the microwave oven for heating. Dependant on the material of the foil 21 the foil is to be removed prior to the microwave heating or may be removed afterwards.

Figure 4 shows another container 27 according to the present invention which is similar to the container 18 of figure 3. In the embodiment of figure 4 the microwave heatable element 28 has the form of an annular sleeve and is clammed circumferentially on the side wall 29 of the container 27. Heating in the microwave oven occurs under similar conditions as have been described in relation to the container 18 as shown in figure 3.

CLAIMS

1. Container having a body and a closure for an opening in the body, which body comprises a heatable content and provided in heat exchange contact with a microwave heatable element.

2. Container as claimed in claim 1, wherein the heatable element comprises microwave heatable material contained in an envelope.

3. Container as claimed in claim 2, wherein the envelope is water tight.

4. Container as claimed in claim 2, wherein the envelope is water permeable.

5. Container as claimed in claim 2, wherein the envelope is semi water permeable.

6. Container as claimed in claim 1-5, wherein the envelope is adhered to the body.

7. Container as claimed in claim 1-5, wherein the envelope is detachably connected to the body.

8. Container as claimed in claim 7, wherein the envelope has the form of a pad.

9. Container as claimed in claim 1-8, wherein the heatable element extends over a part of the height of the body.

10. Microwave heatable element as claimed in claim 1-9.

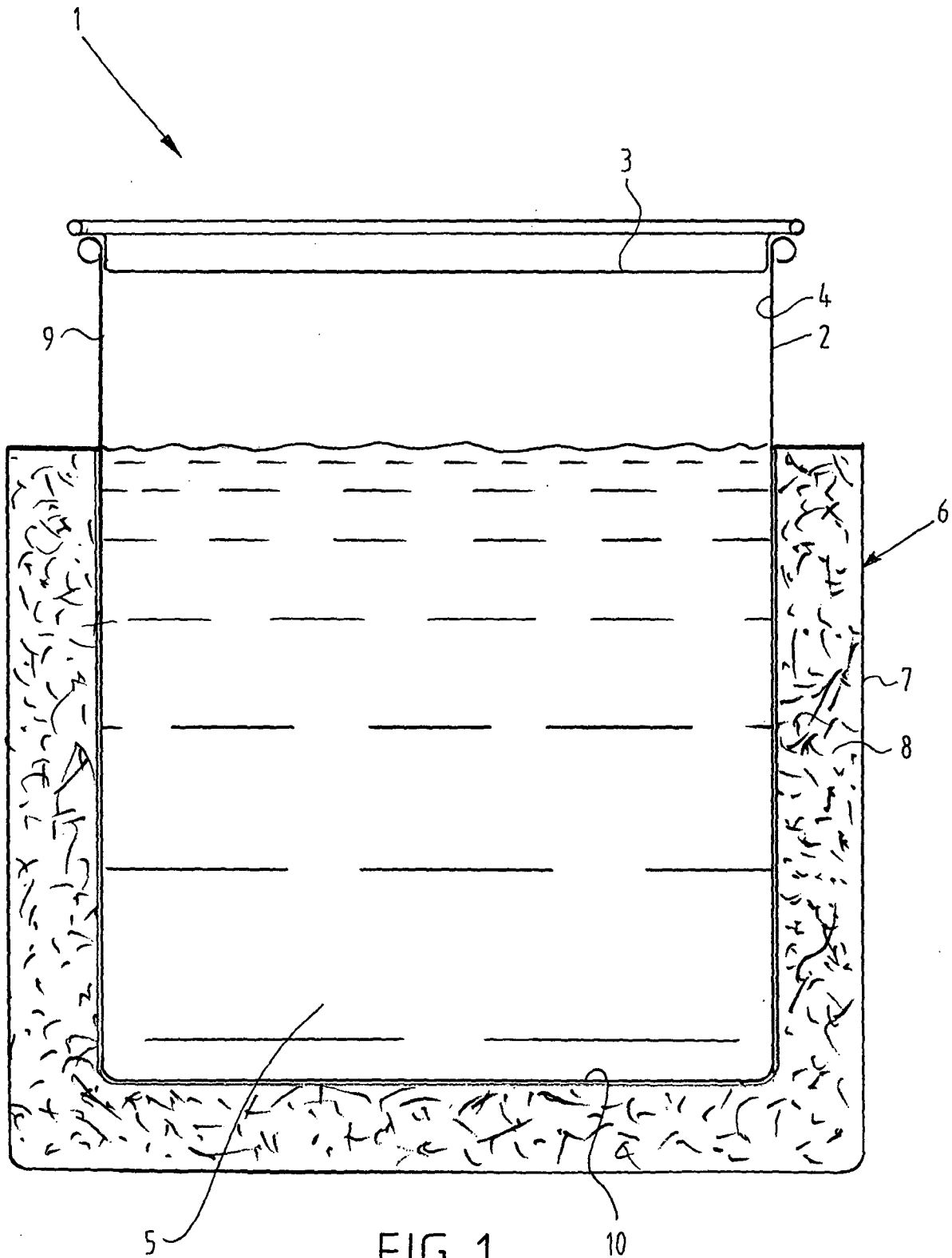


FIG. 1

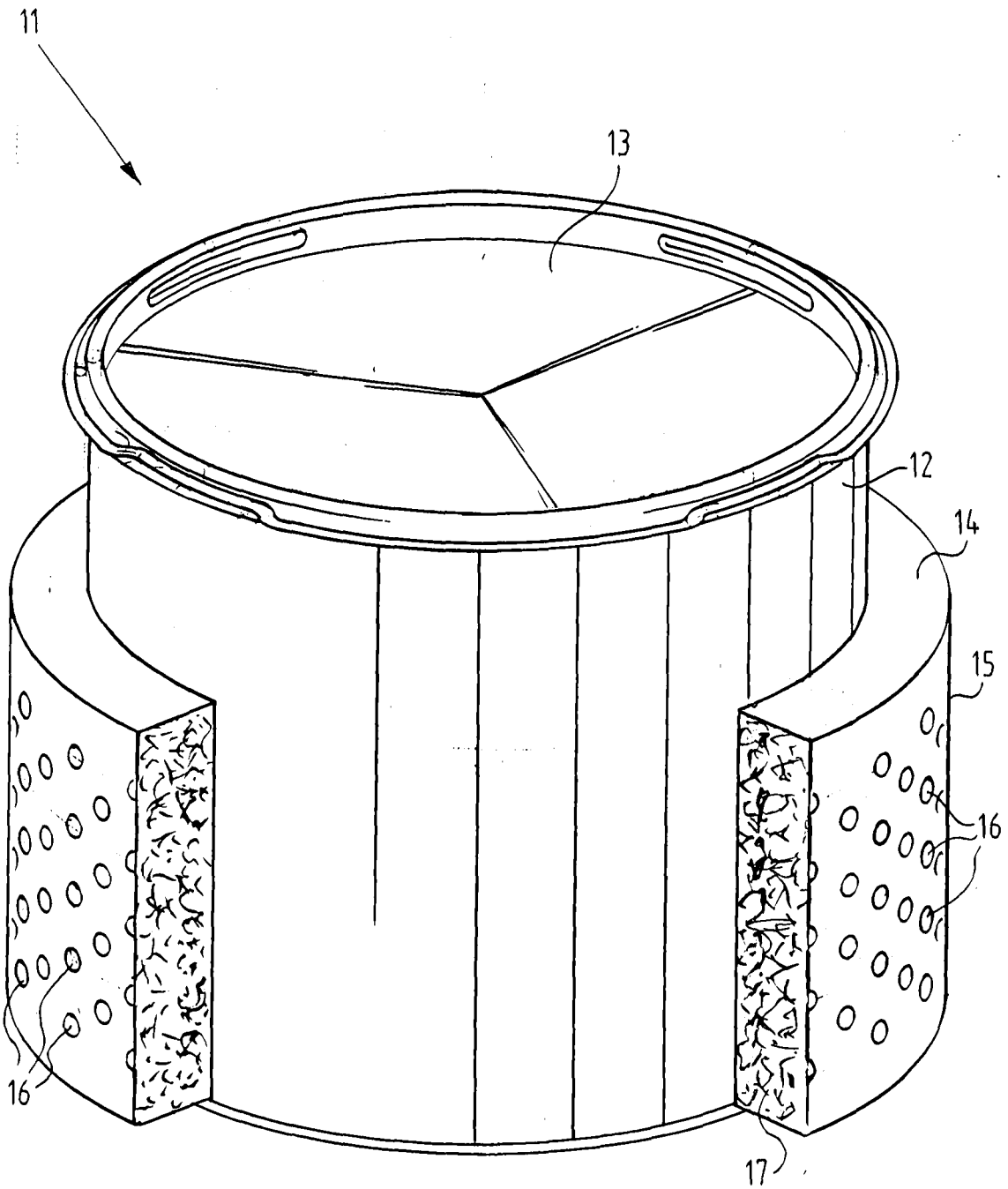


FIG. 2

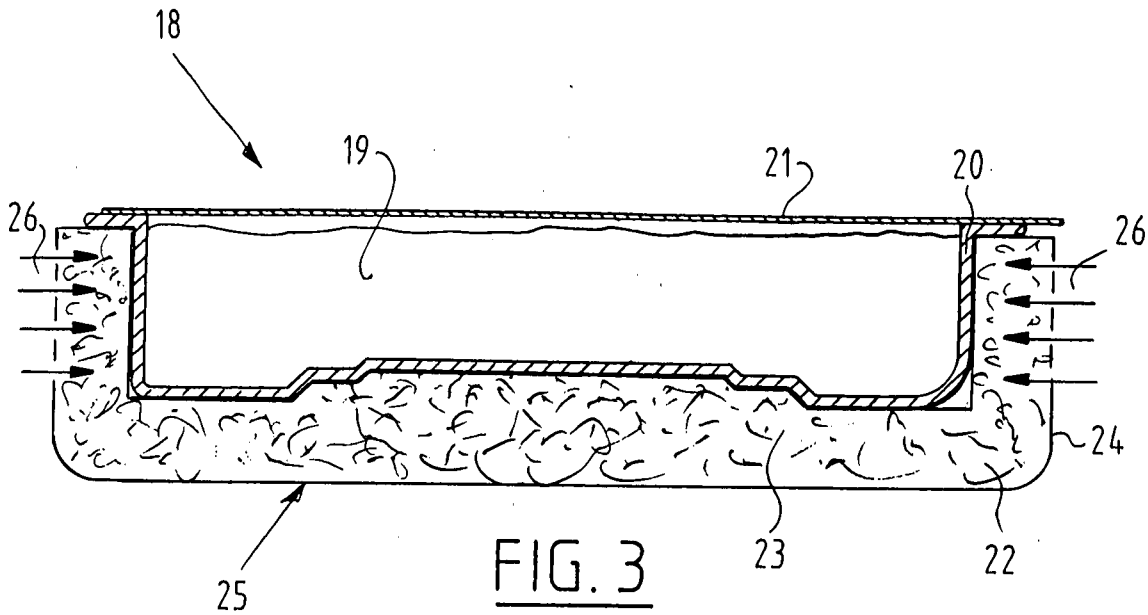


FIG. 3

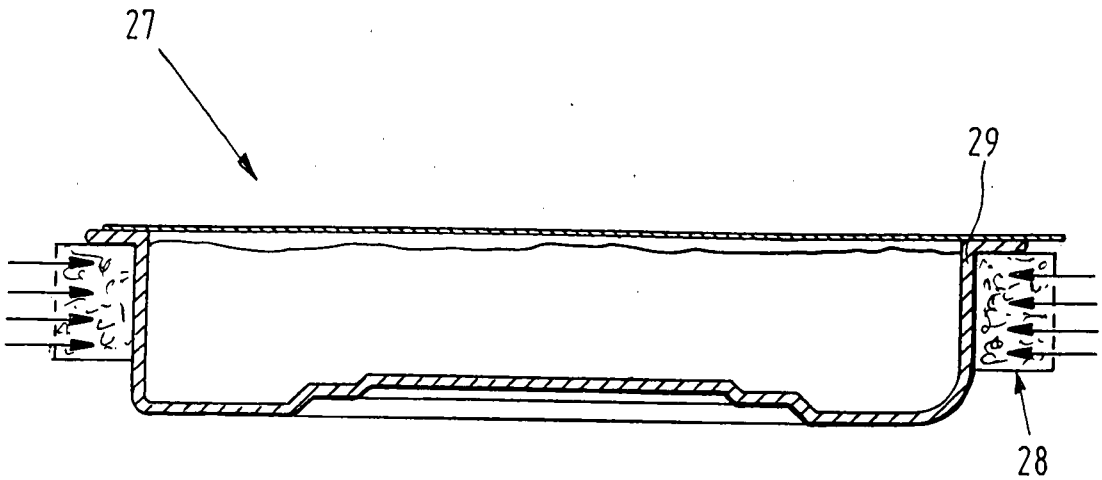


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J36/00 B65D81/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 705 927 A (LEVENDUSKY ET AL) 10 November 1987 (1987-11-10) abstract; figure 1 column 3, line 27 - column 4, paragraph 2	1-10
X	EP 1 352 848 A (CRYOVAC, INC) 15 October 2003 (2003-10-15) abstract; figures 1-3 paragraph [0001]; claim 1 paragraph [0009] - paragraph [0013]	1-10
X	US 4 567 877 A (SEPAHPUR ET AL) 4 February 1986 (1986-02-04) abstract; figure 2 column 2, last paragraph - column 4, paragraph 2	1-10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
2 February 2007	15/02/2007

Name and mailing address of the ISA/	Authorized officer
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International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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