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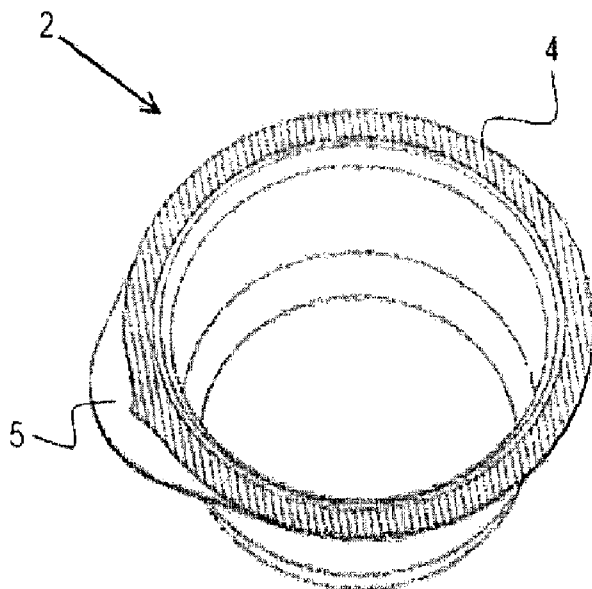
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,  
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- (54) Title: FLEXIBLE PACKAGE



**Fig. 1**

- (57) Abstract: A flexible package (1) which is suitable for packaging food products, contains protective gas therein, and has an adhesive section (4) and an opening section (5); wherein said flexible package comprises a lower package (2) made of CPP (carbon polypropylene) and PAPE (polyamide polyethylene) and an upper package (3) made of PET (polyethylene terephthalate) and PAPE (polyamide polyethylene).



**DESCRIPTION****FLEXIBLE PACKAGE****5 Technical Field**

The invention pertains to a thermoformed flexible package which prolongs shelf life for stuffed baked products that have high water activity.

10 The invention more particularly pertains to a package which is produced by flexible materials with blocking property, e.g. carbon polypropylene (CPP) polyamide polyethylene (PAPE), and polyethylene terephthalate (PET), is thermoformed, and has prolonged shelf life owing to the pressurized protective gas used during packaging.

**15 State of the Art**

Stuffed baked products with high water activity easily deteriorate with chemical and microbiological interactions due to the content thereof. Therefore, their shelf life becomes shorter. And because of their structure, they are not resistant to mechanical effects since  
20 they can be easily deformed due to factors including impacts, falling, etc.

In the state of the art, the packages used for baked products are rigid. The reason for the use of rigid thermoformed packages in products is to protect the product against mechanical effects thanks to the rigidity of the package structure.

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However, rigid packages have disadvantages when it comes to thermoforming. While said rigid packages are being thermoformed, the corners and bases of the packages become thinner. These thinner areas lead to gas, moisture, and fat permeability.

30 Moreover, rigid packages cannot properly adjust to the geometry of any product. Hence, the amount of packaging material to be used increases and the costs become higher.

One of the patents regarding the subject matter is the application numbered EP0294247. This application relates to a rigid package used for protecting and presenting baked  
35 products, cheese, etc.

Another application is the patent application numbered RU2241338C2. In this application, the baked products are required to be subject to several processes in order to be protected against microbiological factors and to have a long shelf life. The baked product is cooled down subsequent to cooking, is treated with ozone, and then put into polypropylene packages with no air and water permeability.

Another application in the state of the art is the one numbered TR200602250U, wherein it is related to a thermoformed package produced of a transparent and solid material to be used for protecting food products, e.g. sandwiches, in food industry.

As a result, due to the drawbacks explained above and inadequacy of the existing solutions regarding the subject matter, it has been deemed necessary to make a development in the related technical field.

### **Objects of the Invention**

The present invention pertains to a thermoformed flexible package which meets the aforementioned needs, eliminates all the disadvantages, and offers some other advantages.

The primary object of the invention is to present the product in a flexible package with high blocking property thanks to the product packaging material.

An object of the invention is to protect the product against microbiological and chemical degradation thanks to the protective gas compressed into the package subsequent to discharging the oxygen therein. Hence, the shelf life of the product will be prolonged.

A similar object of the invention is to obtain an inflated package by adjusting the pressure inside the package through controlling the pressure and flow rate of the protective gas compressed into the package. Thanks to the flexible and inflated nature of the package, it becomes resistant against mechanical effects. In addition to this characteristic, the inflated package has an aesthetic appearance.

Yet another object of the invention is to lower packaging cost thanks to the package formed just according to the product geometry.

And another object of the invention is to prevent some areas of the package from getting thinner due to thermoforming process, and thus to prevent gas, moisture, and fat permeability, thanks to the flexible structure of the package.

5 In order to achieve the aforementioned objects, the flexible package is used for packaging food products and comprises protective gas therein. The present flexible package comprises an adhesive section and an opening section, a lower package made of CPP (carbon polypropylene) and PAPE (polyamide polyethylene), and an upper package made of PET (polyethylene terephthalate) and PAPE (polyamide polyethylene).

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The structural and characteristic aspects and all the advantages of the present invention will be more clearly understood by means of the following figures and the detailed description written with references to these figures; therefore, while making an evaluation, these figures and the detailed description should be taken into account.

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#### **Figures for a Better Understanding of the Invention**

Fig. 1 represents a top perspective view of the lower package.

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Fig. 2 represents a side view of the lower package.

Fig. 3 represents a bottom view of the lower package.

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Fig. 4 represents a side view of the finished package according to the invention after protective gas is compressed thereinto (inflated package).

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The drawings do not necessarily need to be scaled and the details that are not necessary to understand the present invention may have been ignored. Apart from that, the elements that are at least substantially identical or have at least substantially identical functions are referred with the same numeral.

#### **Description of Part References**

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1. Package
2. Lower package
3. Upper package
4. Adhesive section
5. Opening section

### Detailed Description of the Invention

In this detailed description, the preferred embodiments of the thermoformed flexible package according to the invention will be explained in order for the invention to be better understood only, without any limitations.

In Fig. 1, a top perspective view of the lower package (2) is shown. The lower package (2) is provided thereon with an adhesive section (4) which allows the upper package (3) to be closed and with an opening section (5) which facilitates the opening of the upper package (3). Side and bottom views of the lower package (2) are given in Figs. 2 and 3, respectively.

The lower package (2) is made of CPP (carbon polypropylene) and PAPE (polyamide polyethylene) materials, which have a flexible nature. The materials of said lower package (2) can be used in a thickness of 50-150 microns. The lower package (2) is formed in accordance with the product geometry, which is to be packaged thermally (thermoform).

The product is filled into the thus formed lower package (2). Afterwards, the upper package (3) is covered with the flexible and having high blocking property packaging material comprising PET (polyethylene terephthalate) and PAPE (polyamide polyethylene). The materials of said upper package (3) can be used in a thickness of 40-70 microns. Hence, the lower package (2) and upper package (3), in which the product is present, are joined together.

Prior to the adhesion process, all of the oxygen inside the package (1) is discharged. The discharged oxygen is replaced by a protective gas selected from nitrogen, carbon dioxide, etc., or by a mixture thereof, through compression into the package (1) in accordance with the qualification of the product inside the package (1).

While said protective gas is being compressed, at the same time the package (1) where the product is present is sealed through the adhesive section (4). During sealing, the pressure and flow rate of the protective gas compressed into the package (1) are controlled. Thus, the inflation of the package (1) is adjusted. Fig. 4 represents a side view of the finished package (1) according to the invention after protective gas is compressed thereinto and the package is sealed (inflated package (1)). Furthermore, the baked products with high water activity are preserved in chemical and microbiological terms thanks to the gas compressed into the package (1). The product is thus made resistant against mechanical effects due to the

flexibility of the lower package (2) and the upper package (3) materials, and to the internal pressure of the package (1) caused by the gas compressed thereinto.

5 The product present in the package (1) can have many different geometries. The package (1) can, in accordance with the product geometry, be made in different sizes and in any geometry, e.g. hemisphere, rectangular prism, pyramid, truncated pyramid, cylinder, truncated cone, and cone. Any food product can be put into the package (1) in liquid, flexible, solid forms, or as a combination thereof.

10 In a preferred embodiment of the package according to the invention, the lower material comprises 20-30 microns of CPP and 30-120 microns of white PAPE. On the other hand, the upper material comprises 12-20 microns of PET and 28-50 microns of white PAPE. The package can be designed in different thicknesses depending on the factors such as water activity, shelf life, and product geometry.

**CLAIMS**

5 1. A flexible package (1) suitable for packaging food products, contains protective gas therein, and has an adhesive section (4) and an opening section (5), characterized in comprising;

10 - a lower package (2) made of CPP (carbon polypropylene) and PAPE (polyamide polyethylene), and

- an upper package (3) made of PET (polyethylene terephthalate) and PAPE (polyamide polyethylene).

15 2. The package (1) according to Claim 1, characterized in that the materials used in said lower package (2) are of a thickness of between 50 and 150 microns.

3. The package (1) according to Claim 1, characterized in that the materials used in said upper package (3) are of a thickness of between 40 and 70 microns.

20 4. The package (1) according to Claim 1, characterized in that it has an inflated structure with the internal pressure thereof.

25 5. The package (1) according to Claim 1, characterized in that it may have any geometry in accordance with the food products to be put therein.

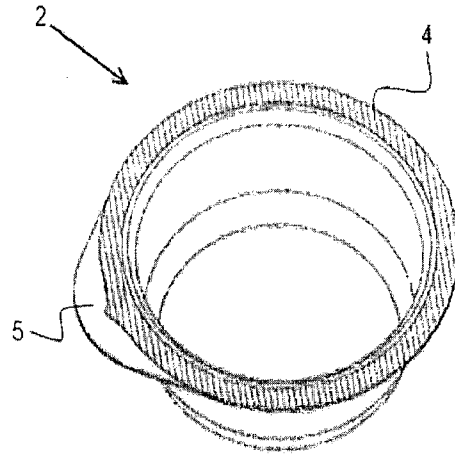


Fig. 1

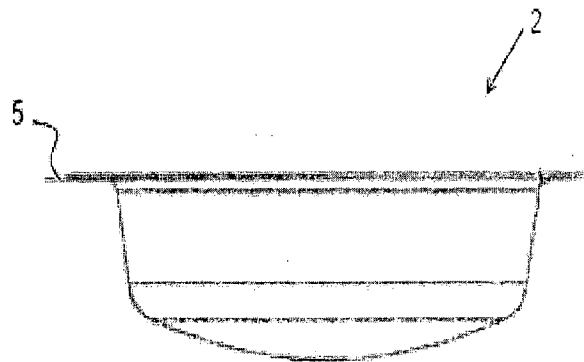


Fig. 2



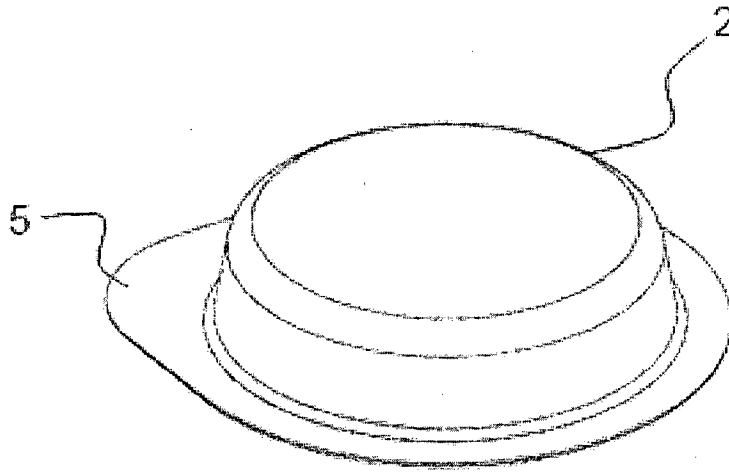


Fig. 3

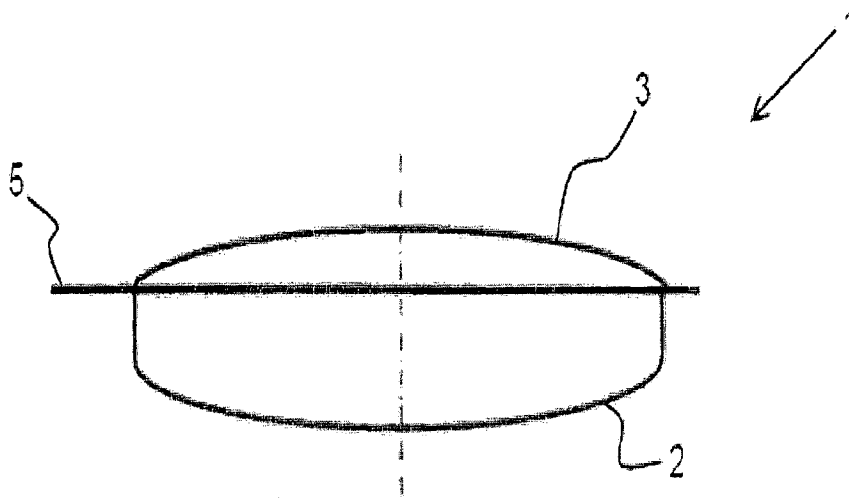


Fig. 4

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/TR2014/000379

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. B65D75/32 B65D81/20  
 ADD.  
 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)  
 B65D

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 practicable, search terms used)  
 EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
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| Y         | paragraph [0006]; figure 1A<br>paragraph [0039] - paragraph [0049]<br>paragraph [0086] - paragraph [0096]<br>paragraph [0155] - paragraph [0159] | 2-4                   |
| Y         | -----<br>WO 85/00339 A1 (ATMOSPHERE PACKAGING PTY LTD [AU]) 31 January 1985 (1985-01-31)<br>page 16, line 19 - line 22                           | 2,3                   |
| Y         | -----<br>WO 99/48770 A1 (EASTMAN CHEM CO [US])<br>30 September 1999 (1999-09-30)<br>page 1, line 13 - page 6, line 13                            | 4                     |

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/TR2014/000379

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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