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## (54) Pouch, web and methods of production and filling

(57) The present invention relates to a pouch comprising a packaging material formed into said pouch by wrapping said packaging material and joining two opposing edges (4) 3 forming a tube with open ends, being closed in a second sealing portion (6) and a third sealing portion (6) by flat-laying and joining opposing packaging material portions at respective ends. The pouch comprises an outer (8) and an inner (7) layer of sheet material only partially joined to each other, wherein the inner and outer layers are at least intermittently joined to each other at an attaching portion (2) extending from the second sealing portion to the third sealing portion. The invention further relates to a web of packaging material for forming pouches, to a method for producing a web of packaging material, and to a method for filling and sealing a pouch.

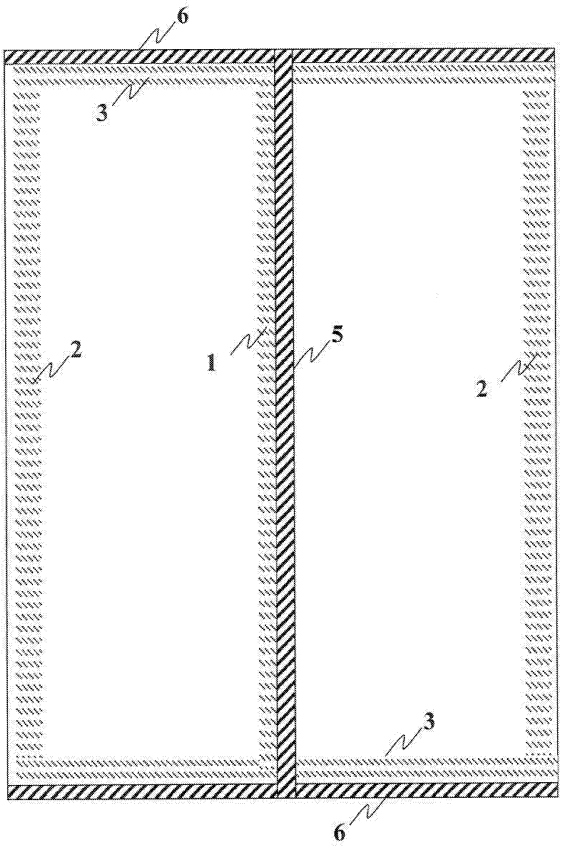


Fig. 2

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## Description

### Field of the Invention

**[0001]** The present invention relates to a pouch comprising a packaging material formed into said pouch by wrapping said packaging material, and in a first sealing portion joining two opposing edges of the packaging material forming a tube with open ends, said tube being closed in a second sealing portion and a third sealing portion by flat-laying and joining opposing packaging material portions at respective ends. The pouch may be adapted for packaging of frozen food products. The invention further relates to a web of packaging material, to a method for producing a web of packaging material and to a method for filling and sealing a pouch from a web of packaging material.

### Background of the Invention

**[0002]** A common way of packaging frozen food products is by using a pouch made from a film in a plastic material, such as polyethylene. Such a pouch has poor insulating properties resulting in relatively rapid thawing of the food products when the pouch is not kept in a freezer. This is especially a problem in countries with a warm climate or in the summertime.

**[0003]** Thawing of the food products results in higher risk of microbial growth, thus reducing the shelf life of the food products, and, subsequently, a higher risk of food poisoning. Furthermore, a higher ambient temperature around the food products followed by re-freezing, such as when a consumer has brought the pouch home from the store and put it in his/her own freezer, or during defrosting of the freezer in the store, results in freeze burns and in the formation of undesirable crystals in and on the food products.

**[0004]** WO 96/06733 discloses a freezer storage bag comprising an inner bag ("liner bag") and an outer bag ("support bag") surrounding the liner and being connected to the liner at the mouth of the liner. The liner is less than 50 μm thick, thermoplastic and pliable, and is said to conform to moist food and reduce freezer burn, or dehydration, during storage of repacked red meat by removing the air around the bagged meat. Preferably the connection between the liner bag and the support bag is such that the liner can conform to the external geometry of a steak placed within the liner bag. This is a way of, in a single bag, accomplishing the usual way of storing meat at home; namely to first pack the meat in plastic film and then to put the thus film packed item in an ordinary plastic bag.

**[0005]** US 4 211 267 discloses a thermal insulating and shock absorbing bag with opposing walls, particularly a carrying bag, with an outer layer of thermoplastic foam which is mentioned as providing effective insulating properties. The bag is further provided with an inner layer of polyethylene film connected to the outer layer by welding at the edges of the walls. The layers are preferably separated by an intermediate layer of thermal insulating material.

**[0006]** US 4 211 091 discloses a flexible insulated lunch bag which can be collapsed when not in use. The bag comprises a top, a front wall, a rear wall, a bottom wall and a pair of side walls, each wall comprising an outer wall and an inner wall with a layer of insulating material therebetween. The bag further comprises means for opening and closing thereof, and carrying means. Moreover the bag is adapted to be filled and closed by hand. This is a rather complex and costly bag, adapted to be used several times.

### Summary of the Invention

**[0007]** An object of the invention is to provide a pouch having improved heat insulating properties and which is adapted for automated processes in e.g. manufacturing, filling and sealing.

**[0008]** An other object of the invention is to provide a pouch where the properties of the packaging material on the inside of the pouch and on the outside of the pouch may be chosen separately.

**[0009]** These objectives are achieved according to the present invention by providing a pouch, a web, a method for producing a web, and a method for filling and sealing a pouch.

**[0010]** The pouch comprises a packaging material formed into said pouch by wrapping said packaging material, and in a first sealing portion joining two opposing edges of the packaging material forming a tube with open ends, said tube being closed in a second sealing portion and a third sealing portion by flat-laying and joining opposing packaging material portions at respective ends, and is characterised in that said packaging material comprises an outer and an inner layer of sheet material only partially joined to each other, wherein said sheet materials are joined to each other at the first, second and third sealing portions, and wherein the inner layer of sheet material and the outer layer of sheet material are further at least intermittently joined to each other at an attaching portion extending from the second sealing portion to the third sealing portion.

**[0011]** The present invention is based on the finding that a pouch with double walls (layers of sheet material) with an insulating layer, of e.g. air, in between these walls is able to significantly prolong the time span from when the pouch is removed from a frozen environment, e.g. the freezer in a supermarket, until the content, or a part of the content, of the pouch acquires a temperature above 0 degrees Celsius, i.e. has thawed, as compared with conventional pouches.

**[0012]** The invention also allows for different materials to be used for the inner layer of sheet material and for the outer layer of sheet material.

**[0013]** The double wall structure of the inventive pouch traps an amount of insulating air between the walls, there-

by significantly reducing the heat transport from the outside of the pouch to the inside, or vice versa. It should be appreciated that this insulating effect may be improved further by additional walls, e.g. a triple wall structure.

**[0014]** The layers of sheet material forming the walls of the pouch are conveniently joined to each other at the pouch seals so that the pouch is formed from a partly joined double layered packaging material rather than from two separate pouches, one within the other. These joints also contributes to arresting the air flow between the walls, thus further reducing heat transportation. By joining the two layers of sheet material together at the seals, peeling of the outer layer at the edges of the packaging material may also be prevented.

**[0015]** The sealing of the pouch can be accomplished by using any conventional method, such as gluing or heat sealing, to seal portions of the inner layer of sheet material together. If heat sealing is used, the outer layer of sheet material may be included in the seal, depending on the physical characteristics of the outer layer relative those of the inner layer (e.g. by melting the two layers at least partly together).

**[0016]** Joining the two layers of sheet material together may be accomplished by any means capable of binding one layer to the other, such as a glue (hot or cold), a molten polymer or by melting the two layers together (e.g. in the seals of the pouch).

**[0017]** Joining the two layers of sheet material together at one or more additional attaching portion(s) further restricts air movement between the sheets and thus improves the heat insulating properties of the pouch. The sheets should however not be joined to such a degree as to effectively eliminating the insulating layer of air at a percentage of the pouch area large enough to outweigh the positive insulating effects of restricting air movement further.

**[0018]** The pouches of the present invention are especially convenient for packaging food products.

**[0019]** Preferred embodiments of the pouch follow from the dependent claims.

**[0020]** Additional attaching portions, where the layers of sheet material are joined together, extending longitudinally from one end of the pouch tube to the other at opposing sides of the circumference of said tube has empirically been shown to be a preferred way of restricting the movement of the insulating air. If the layers of sheet material are continuously joined along the longitudinal attaching portions, the air is confined within a smaller space or spaces forming cushion(s). This restricts air movement further and also prevents the insulating air from congregating all at one side of the pouch, and thus improves the insulating properties.

**[0021]** It is also possible to achieve restricted air movement through other types of attaching portions whereby the space defined between the layers of sheet material is partitioned, preferably into a plurality of closed compartments.

**[0022]** The outer layer of sheet material may be made of any flexible material, such as polyethylene (PE), polypropylene (PP), polyesters or polyamides (PA). Polyethylene may be used to reduce cost as it is a relatively cheap material, but it may stretch during gravure printing. Polypropylene, polyesters and polyamides are in many cases more suitable since they may be gravure printed without stretching, and thus gives the pouch a more appealing appearance, but are more expensive than polyethylene. Polyesters may be used if resistance to high temperatures is desired. A polyamide sheet material is presently preferred as this material is particularly durable and may thus be used in relatively thin layers, thus reducing material costs and environmental influence.

**[0023]** The inner layer of sheet material may be made of any flexible material, but polyethylene is preferred as it is a relatively cheap material, has good food contacting properties and has good sealing characteristics.

**[0024]** The thicknesses of the respective layers are dependent on the materials chosen. A few examples of combinations of layer materials and their preferred thicknesses are now given. If, for example, polyamide is chosen for the outer layer and polyethylene is chosen for the inner layer (PA/PE) the preferred thickness ranges are 15-50μm/25-75μm, and the most preferred values are 25μm/50μm. If the combination polypropylene/PE is chosen, the preferred thickness ranges are 15-50μm/25-75μm, and the most preferred values are 40μm/35μm. If the combination polyester/PE is chosen, the preferred thickness ranges are 10-30μm/25-75μm, and the most preferred values are 15μm/50μm. Finally, if the combination PE/PE is chosen, the preferred thickness ranges are 25-75μm/25-75μm, and the most preferred values are 35μm/35μm.

**[0025]** As stated above it is often preferable to use different materials for the outer (printed) layer and the inner (food contacting) layer. It may however sometimes be preferable to use the same material for both layers, e.g. to facilitate waste disposal and recycling, or to simplify the manufacturing process.

**[0026]** In one embodiment of the invention the double layer structure of the pouch extends beyond the attaching portions joining the sheet materials to each other so that an end section of the pouch is formed where the two sheet materials are not joined to each other, other than at the longitudinal sealing portion formed when the packaging material is wrapped into a tube, and optionally at some attaching portions also at this end section, but such attaching portions are close to the longitudinal sealing portion, leaving at least half the circumference of the tube opening free from attaching portions joining the sheet materials together. Upon removing the transverse seal at this end section (i.e. opening the pouch), e.g. by using scissors to cut the seal, an opening into the pouch is formed having two annular walls created by the sheet materials, one within the other.

**[0027]** This embodiment makes it possible to re-close the pouch by wringing the outer sheet material at the

opening outwardly (or inwardly) together with the inner sheet material. For this action to close the pouch opening the inner annular wall is flat-layed and both opposing portions of the inner sheet material is wrought together with the portion of the outer sheet material containing the longitudinal sealing portion (and optional attaching portions). The sheet materials are then wrought at least one more time so that a coil is formed along the circumference of the previously open end of the pouch. The coil is halfway around formed by the outer sheet material and halfway around formed by the opposing portion of the outer sheet material and both opposing portions of the inner sheet material.

**[0028]** It should be appreciated that this way of re-closing a pouch can be used also for other kinds of pouches having more than one layer, e.g. double layered pouches consisting of two separate pouches, one within the other, or double layered pouches where the two layers are only joined at some (not all) of the 3 sealing portions of the pouch.

**[0029]** In an other embodiment the pouch is re-closable by the inclusion of a zip-lock attached to the inner sheet material at one of the transverse seals.

**[0030]** The web of packaging material for forming pouches, comprises two longitudinal side edges, and is characterised in that said packaging material comprises two layers of sheet material at least intermittently joined to each other at longitudinal attaching portions at said side edges of said web.

**[0031]** In order to facilitate the automated production of the pouch of the present invention the package material and the web should preferably be adapted such that they may easily be handled by existing equipment for pouch forming and handling, i.e. the package material need to physically resemble the commonly used single walled plastic film web used for production of conventional pouches, as described in the background section of the present description.

**[0032]** By joining the two layers of sheet material to each other the handling of the double layered web is facilitated as the layers are prevented from slipping relative each other, and the web may thus be handled in the same way, and using the same equipment, as regular single layer webs.

**[0033]** Other advantages of respective feature of the web have been discussed in detail in respect of the pouch; reference is made to that discussion.

**[0034]** Preferred embodiments of the web follow from the dependent claims.

**[0035]** The handling of the double layered web may be additionally facilitated by joining the two layers of sheet material also at transverse attaching portions, thus preventing slippage even further. The best handling properties are obtained when the layers of sheet material are continuously joined at the longitudinal and/or transverse attaching portions. The risk of equipment getting caught in between the joining points, especially at the longitudinal attaching portions, are minimised by joining the layers continuously at the attaching portions. This will also reduce the risk of unintentional peeling of the two layers when the web has been formed into a pouch.

**[0036]** The handling of the double layered web may be further facilitated by joining at least intermittently, preferably continuously, the two layers of sheet material also at additional attaching portions essentially parallel to the side edges of the web. As mentioned in respect of the pouch, this will also give superior insulating properties to the pouch formed from the web.

**[0037]** The features of the dependent claims in respect of the pouch are also applicable to the web. The advantages of respective feature are discussed in detail in respect of the pouch; reference is made to that discussion.

**[0038]** The method for producing a web of packaging material comprising two layers of sheet material only partially joined to each other, comprises the steps of

providing a web of a first sheet material having two longitudinal side edges;

providing a web of a second sheet material having two longitudinal side edges;

placing said first sheet material on top of said second sheet material; and

joining said first sheet material and said second sheet material to each other at least intermittently at longitudinal attaching portions along the respective longitudinal side edges of respective sheet materials.

**[0039]** The advantages of respective feature of the method have been discussed in detail in respect of the pouch and the web; reference is made to those discussions. The features of the dependent claims in respect of the pouch and the web are also applicable to the method. The advantages of respective feature are discussed in detail in respect of the pouch and the web; reference is made to those discussions.

**[0040]** The method for filling and sealing a pouch from a web of packaging material comprising two layers of sheet material only partially joined to each other and having two longitudinal side edges, the two sheet materials being at least intermittently joined together at longitudinal attaching portions along said two longitudinal side edges, comprises

wrapping said packaging material and joining the two longitudinal side edges by a longitudinal seal, forming a tube with open ends;

providing a first transverse seal across the tube of packaging material, by flat-laying and joining opposing packaging material portions, and forming a tube closed at one end;

filling the closed tube with a predetermined amount of product; and

providing a second transverse seal across the tube of packaging material, by flat-laying and joining opposing packaging material portions, and from the tube forming a filled pouch with both ends closed.

**[0041]** The method may optionally further comprise cutting the packaging material at the transverse seals to obtain an individual (discrete) pouch.

**[0042]** The advantages of respective feature of the method have been discussed in detail in respect of the pouch and the web; reference is made to those discussions. The features of the dependent claims in respect of the pouch and the web are also applicable to the method. The advantages of respective feature are discussed in detail in respect of the pouch and the web; reference is made to those discussions.

Brief Description of the Drawings

**[0043]** The invention will hereinafter be described by way of examples with reference to the appended schematic drawings that show a presently preferred embodiment of the invention.

**[0044]** Fig. 1 is a schematic plan view of a web according to the invention.

**[0045]** Fig. 2 is a schematic rear view of a pouch according to the invention.

**[0046]** Fig. 3 is a diagram of a thawing curve of the inventive pouch as compared to a conventional pouch.

**[0047]** Fig. 4 is a schematic top view of a re-closable pouch according to the invention.

**[0048]** Fig. 5 is a schematic cross-sectional view of the re-closable pouch in Fig. 4 along the line A-A.

**[0049]** Fig. 6 is a schematic front view of a re-closed pouch according to the invention.

**[0050]** Fig. 7 is a schematic cross-sectional view of the re-closed pouch in Fig. 6 along the line B-B.

Detailed Description of Preferred Embodiments

Example 1

**[0051]** A double layered web according to the present invention and schematically illustrated in Fig 1 was formed by partly joining two individual sheet materials.

**[0052]** A web of polyamide film (45 cm wide, 25 μm thick) was provided on a reel. The film was fed into a printing machine and printed (gravure) and the printed film was subsequently put onto another reel. A web of polyethylene film (45 cm wide, 50 μm thick) was provided on yet another reel, and the printed polyamide web and the polyethylene web were both from their respective reels fed into a conventional laminating machine where they were placed or lain on top of each other and continuously joined to each other at four parallel, 1 cm wide, longitudinal attaching portions 1 and 2, two at the longitudinal side edges 4 of the combined web and two evenly spaced thereinbetween, and at transverse, 2 cm wide, attaching portions 3 evenly spaced 30 cm apart along the combined web using conventional food approved cold sealing glue. The combined web was subsequently again put on a reel.

Example 2

**[0053]** A double layered pouch according to the present invention and as schematically illustrated in Fig 2 was formed from the web of Example 1 and filled.

**[0054]** The double layered web produced in Example 1 was fed continuously from its reel into a conventional sealing and filling machine. In the machine the web was wrapped and the two longitudinal side edges 4 of the web were continuously sealed together by melting the polyethylene film portions together at the longitudinal attaching portions 1, forming a tube with a 0.5 cm wide longitudinal seal 5. A first, bottom, 1 cm wide transverse seal 6 was placed across said tube by flat-laying and melting together the opposing polyethylene films in the middle of a transverse attaching portion 3, forming the closed bottom of the pouch to be. The closed tube was filled with mixed vegetables and a second, top, 1 cm wide transverse seal 6 was in the same way placed in the middle of the next transverse attaching portion 3 above the mixed vegetables contained in the tube, thus forming a vegetable containing pouch closed at both ends. This second, top, seal 6 also constitutes the bottom seal 6 of the next pouch, which is then formed and filled in the same way. Finally the pouches were separated from each other by cutting the packaging material transversely in the middle of every transverse seal 6. As the two layers of the web were made of polyethylene and polyamide respectively, and as these two materials do not melt together when applying the seals, the two layers are only joined to each other through the joining/laminating actions of Example 1.

Example 3

**[0055]** The insulating ability of the inventive pouch formed in Example 2 was compared to that of a conventional, single walled, pouch for frozen food.

**[0056]** The filled conventional pouch was identical to the test package with the exception that it was formed from a laminate consisting of an outer polyamide film (25 μm thick) continuously laminated to an inner polyethylene film (40 μm thick) so that no pockets of air were formed between the two films. The two pouches were removed from the freezer (-20°C) at the same time and placed in 30°C. The food temperatures of the two pouches were measured every 5 minutes and the results are presented in Fig 3.

**[0057]** As is evident from Fig 3, the pouch according to the present invention significantly prolongs the time before the food product starts thawing, i.e. before the food temperature rises to above 0°C.

Example 4

**[0058]** A pouch was re-closed.

**[0059]** A pouch of the present invention was opened by cutting off the top transverse attaching portion 3 using a pair of scissors. At the topmost part of the opened pouch the two walls of the pouch are joined together only at the longitudinal seal 5 along the backside of the pouch tube,

essentially forming an inner tube 7 and an outer tube 8 at this topmost part of the pouch. The inner tube 7 of the pouch was flat-layed against the backside of the outer tube 8 of the pouch, so that at the backside of the top of the pouch three layers of material 7a, 7b & 8a lay against each other, and at the front side of the top of the pouch there was only one layer of material 8b. The layer 8b at the front was then folded outwardly, and at the same time the three layers 7a, 7b & 8a at the back were also, all three together, folded outwardly (illustrated by the arrows in Fig 5). This wringing action was repeated so that the top of the pouch was wrought several times outwardly, forming a self-locking coil 9 around the circumference of the outer tube 8 while sealing the inner tube 7, thus preventing the contents of the pouch from falling out of the pouch.

Example 5

**[0060]** In accordance with another aspect, the invention may be considered to relate to a pouch comprising a packaging material formed into said pouch by wrapping said packaging material and joining two opposing edges (4) forming a tube with open ends, being closed in a second sealing portion (6) and a third sealing portion (6) by flat-laying and joining opposing packaging material portions at respective ends. The pouch comprises an outer (8) and an inner (7) layer of sheet material only partially joined to each other, wherein the inner (7) and outer (8) layers are at least intermittently joined to each other at an attaching portion (2) extending from the second sealing portion (6) to the third sealing portion (6).

**Claims**

1. A pouch comprising a packaging material formed into said pouch by wrapping said packaging material, and in a first sealing portion (5) joining two opposing edges (4) forming a tube with open ends, said tube being closed in a second sealing portion (6) and a third sealing portion (6) by flat-laying and joining opposing packaging material portions at respective ends,
**characterised in that** said packaging material comprises an outer (8) and an inner (7) layer of sheet material only partially joined to each other, wherein said sheet materials are joined to each other at the first (5), second (6) and third (6) sealing portions, and wherein the inner layer of sheet material (7) and the outer layer of sheet material (8) are further at least intermittently joined to each other at an attaching portion (2) extending from the second sealing portion (6) to the third sealing portion (6).

2. A pouch according to claim 1, wherein the two layers of sheet material (7,8) are joined at two attaching portions (2) extending from the second sealing portion (6) to the third sealing portion (6) and positioned opposing each other in respect of the circumference of the tube.

3. A pouch according to claim 2, wherein said two layers of sheet material (7,8) are continuously joined at said attaching portions (2).

4. A pouch according to claim 1, wherein a space defined between the outer layer of sheet material (8) and the inner layer of sheet material (7) is partitioned by attaching portions in which the sheet material layers are joined to each other.

5. A pouch according to claim 4, wherein the space is partitioned into a plurality of closed compartments.

6. A pouch according to any one of the previous claims, wherein the outer layer of sheet material (8) is made of a material from the group consisting of polyethylene, polypropylene, polyesters and polyamides.

7. A pouch according to any one of the previous claims, wherein the inner layer of sheet material (7) is made of polyethylene.

8. A pouch according to any one of the previous claims, wherein the inner layer of sheet material (7) and the outer layer of sheet material (8) are made of the same material.

9. A pouch according to any one of claims 1-7, wherein the inner layer of sheet material (7) and the outer layer of sheet material (8) are made of different materials.

10. A web of packaging material for forming pouches, comprising two longitudinal side edges (4),
**characterised in that** said packaging material comprises two layers of sheet material (7, 8) at least intermittently joined to each other at longitudinal attaching portions (1) at said side edges of said web.

11. A web according to claim 10, wherein the two layers of sheet material (7,8) are further at least intermittently joined to each other at transverse attaching portions (3) across said web.

12. A web according to claim 10 or 11, wherein the two layers of sheet material (7,8) are continuously joined to each other at said longitudinal attaching portions (1).

13. A web according to claim 11 or 12, wherein the two layers of sheet material (7,8) are continuously joined to each other at said transverse attaching portions (3).

**14.** A web according to any one of claims 10-13, wherein the two layers of sheet material (7,8) are further at least intermittently joined to each other at additional attaching portions (2) essentially parallel to said side edges (4).

**15.** A web according to claim 14, wherein the two sheet, materials (7,8) are continuously joined to each other at said additional attaching portions (2).

**16.** A method for producing a web of packaging material comprising two layers of sheet material (7,8) only partially joined to each other, comprising the steps of
providing a web of a first sheet material (7) having two longitudinal side edges (4);
providing a web of a second sheet material (8) having two longitudinal side edges (4);
placing said first sheet material on top of said second sheet material; and
joining said first sheet material and said second sheet material to each other at least intermittently at longitudinal attaching portions (1) along the respective longitudinal side edges (4) of respective sheet materials (7,8).

**17.** A Method according to claim 16, wherein said first sheet material and said second sheet material are continuously joined at said longitudinal attaching portions (1).

**18.** A method according to claim 16 or 17, further comprising the step of
joining said first sheet material and said second sheet material to each other at least intermittently at transverse attaching portions (3).

**19.** A method according to claim 18, wherein said first sheet material and said second sheet material are continuously joined at said transverse attaching portions (3).

**20.** A method for filling and sealing a pouch from a web of packaging material comprising two layers of sheet material (7,8) only partially joined to each other and having two longitudinal side edges (4), the two sheet materials (7,8) being at least intermittently joined together at longitudinal attaching portions (1) along said two longitudinal side edges, the method comprising
wrapping said packaging material and joining the two longitudinal side edges (4) by a longitudinal seal (5), forming a tube with open ends;
providing a first transverse seal (6) across the tube of packaging material, by flat-laying and joining opposing packaging material portions, and forming a tube closed at one end;
filling the closed tube with a predetermined amount of product; and
providing a second transverse seal (6) across the tube of packaging material, by flat-laying and joining opposing packaging material portions, and from the tube forming a filled pouch with both ends closed.

**21.** A method according to claim 20, further comprising cutting the packaging material at, and parallel to, the first transverse seal (6) and the second transverse seal (6), thus separating the filled pouch from the remainder of the packaging material.

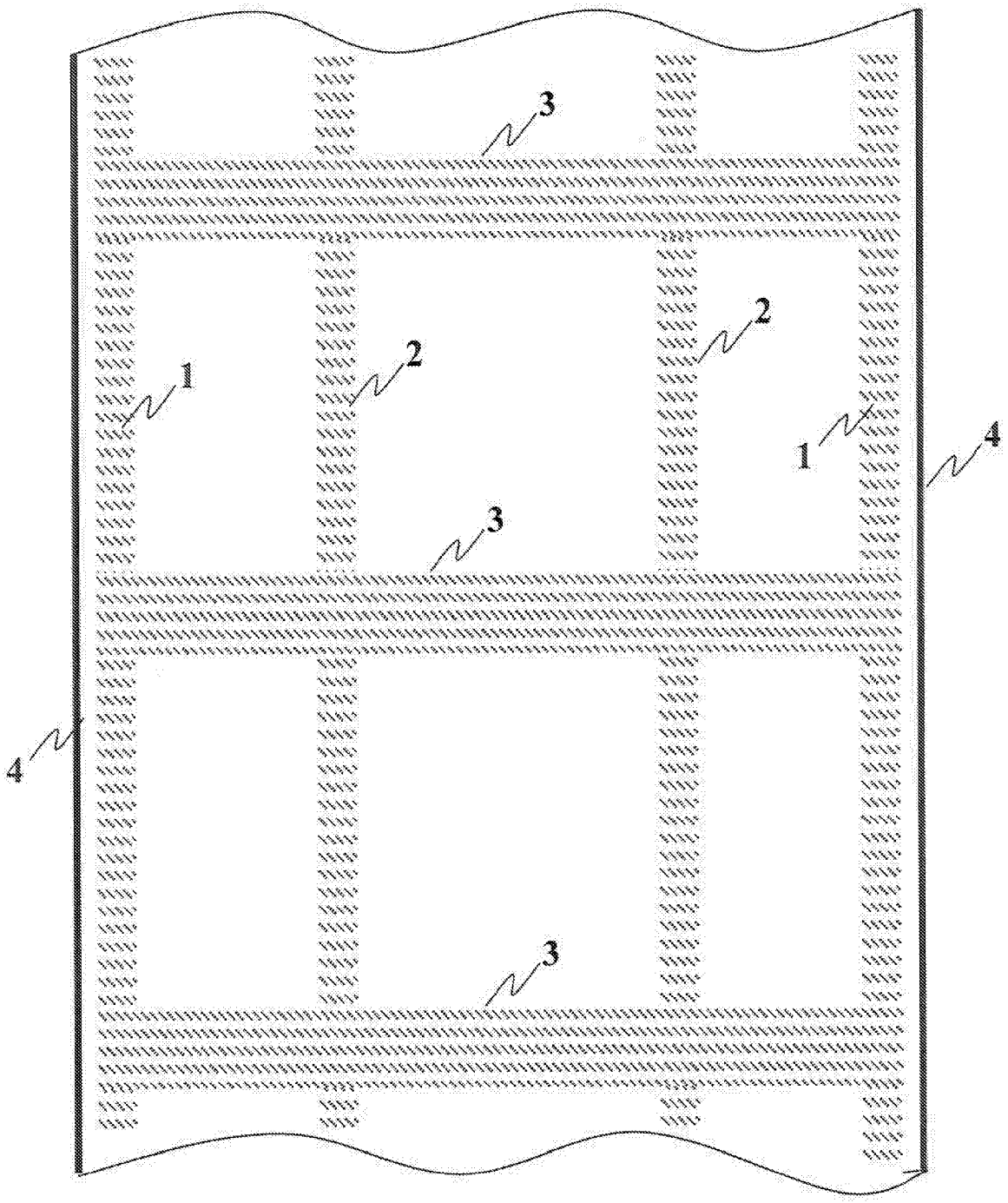


Fig. 1

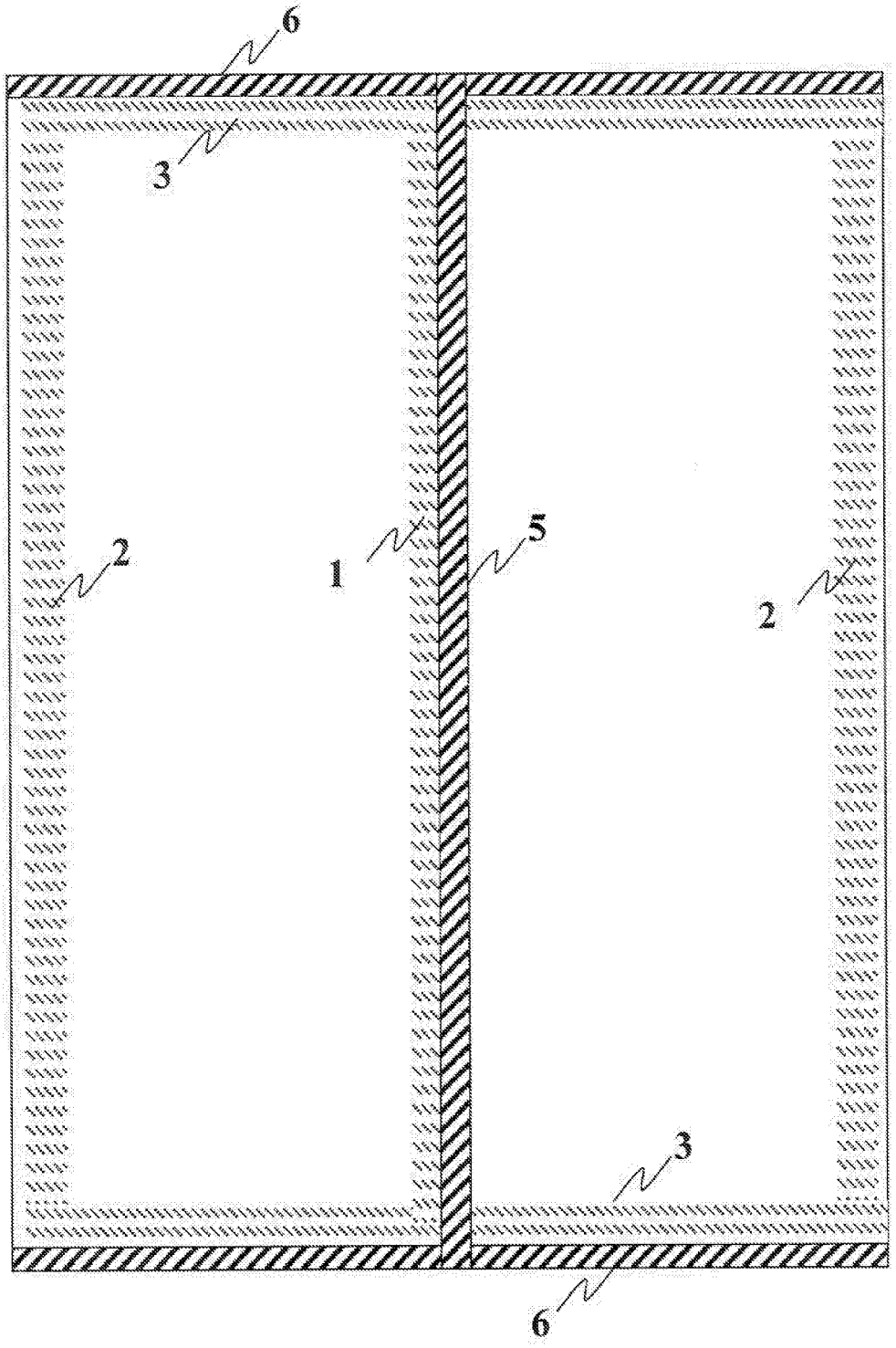


Fig. 2

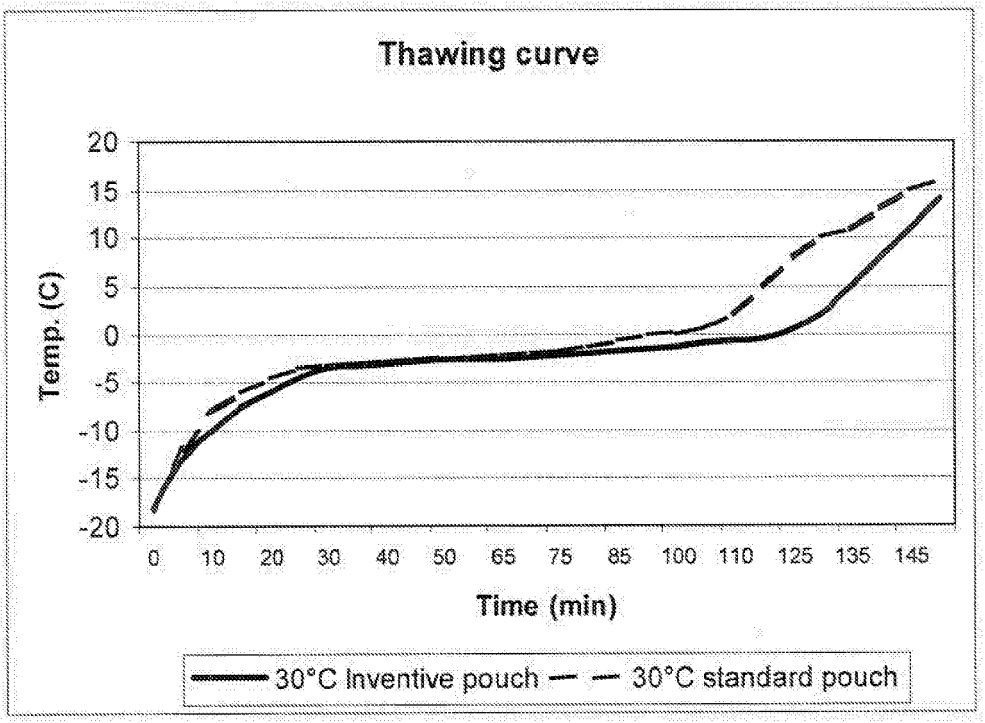
Thawing curve
Temp. (C)
20
15
10
5
0
-5
-10
-15
-20
0
10
20
30
40
50
65
75
85
100
110
125
135
145
Time (min)
30°C Inventive pouch
30°C standard pouch

Fig. 3

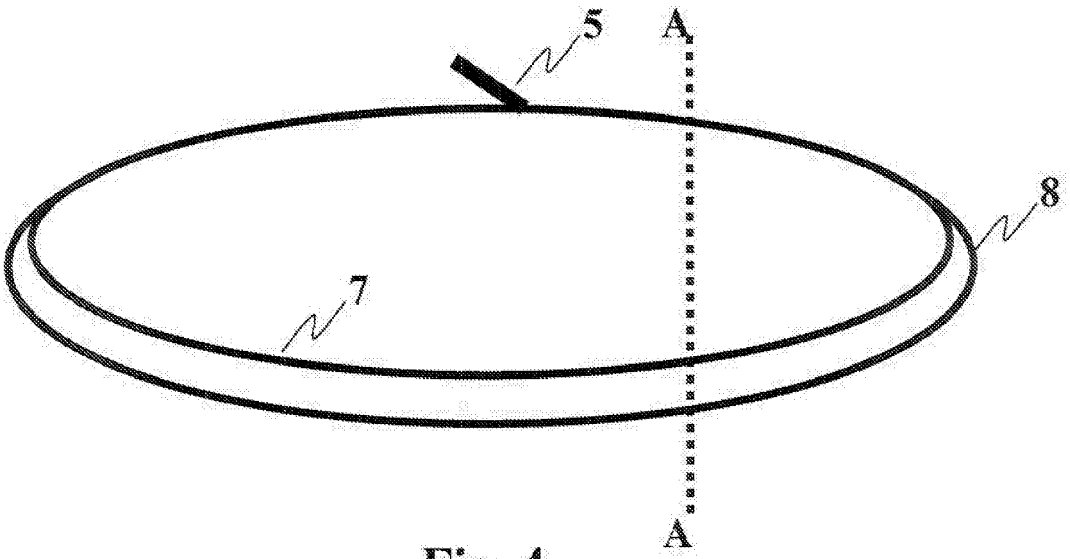


Fig. 4

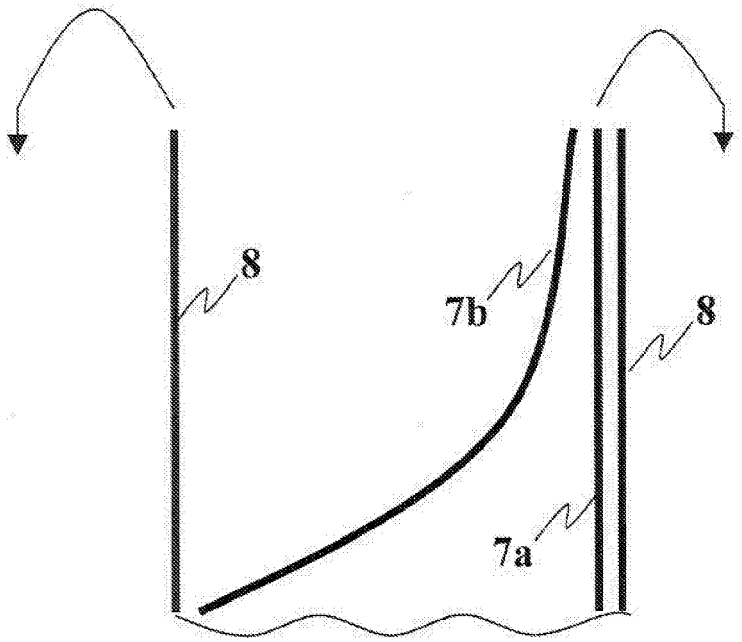


Fig. 5

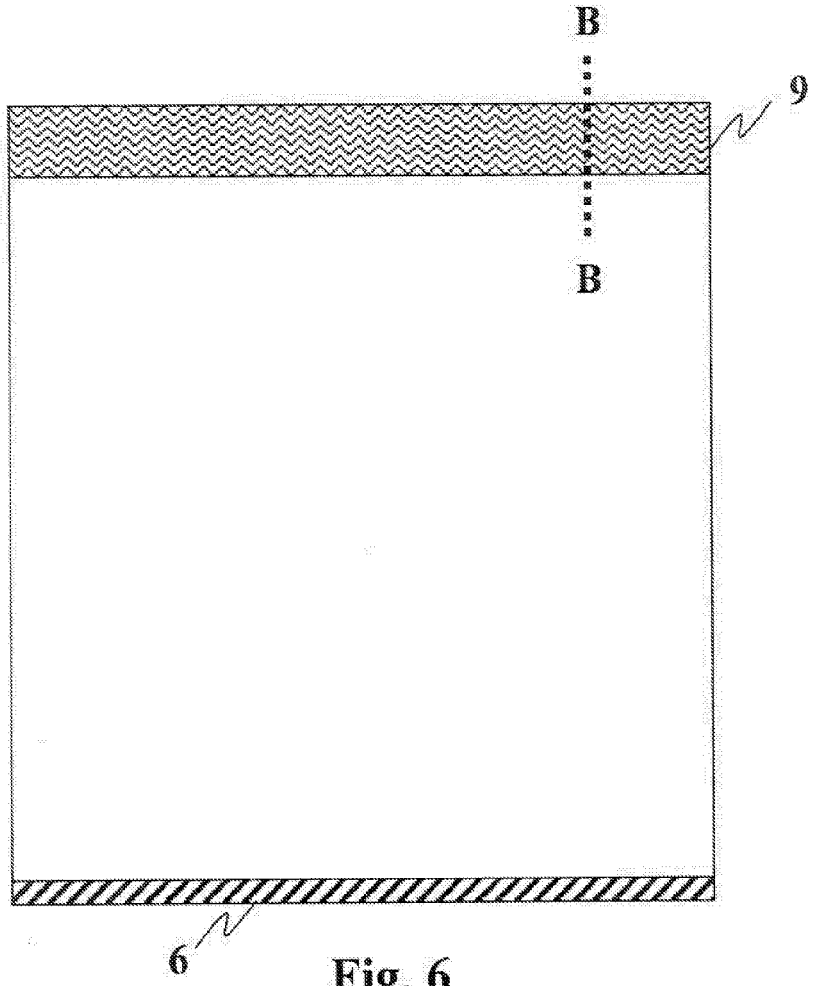


Fig. 6

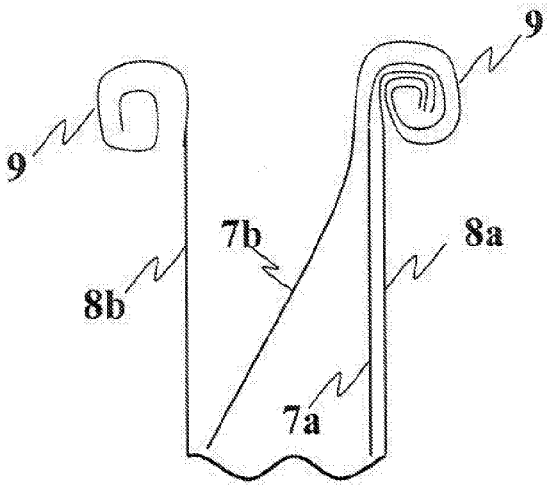


Fig. 7

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# EUROPEAN SEARCH REPORT

Application Number
EP 05 11 2140

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 8 June 2006 | Visentin, M |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 11 2140

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