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(72) Inventor: **Anghileri, Gianmario**
23864 Malgrate (Lecco) (IT)

(74) Representative: **Tansini, Elio Fabrizio**
C/O Bugnion S.p.A.,
Viale Lancetti, 17
20158 Milano (IT)

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(71) Applicant: **NOVACART S.P.A.**
23846 Garbagnate Monastero (Lecco) (IT)

(54) **Tray, in particular for containing foodstuffs and method for the realisation thereof**

(57) It is disclosed a tray of sheet paper material for containing foodstuffs in which there is a bottom and a side wall emerging therefrom and defining, in cooperation with said bottom, a holding space facing upwardly under use conditions of the tray; the side wall is defined by alternated straight portions and curved portions both having upwardly-facing flat surfaces (7, 9) to allow en-

gagement of a closing film heat-sealed thereto; the straight portions (4) also have reinforcing tabs in engagement at the lower part thereof with the flat surfaces (7) and the tray is also provided with a reinforcing edge (10) folded downwardly along the whole upper perimeter of the container itself. The tray thus made has excellent features of mechanical resistance to deformations.

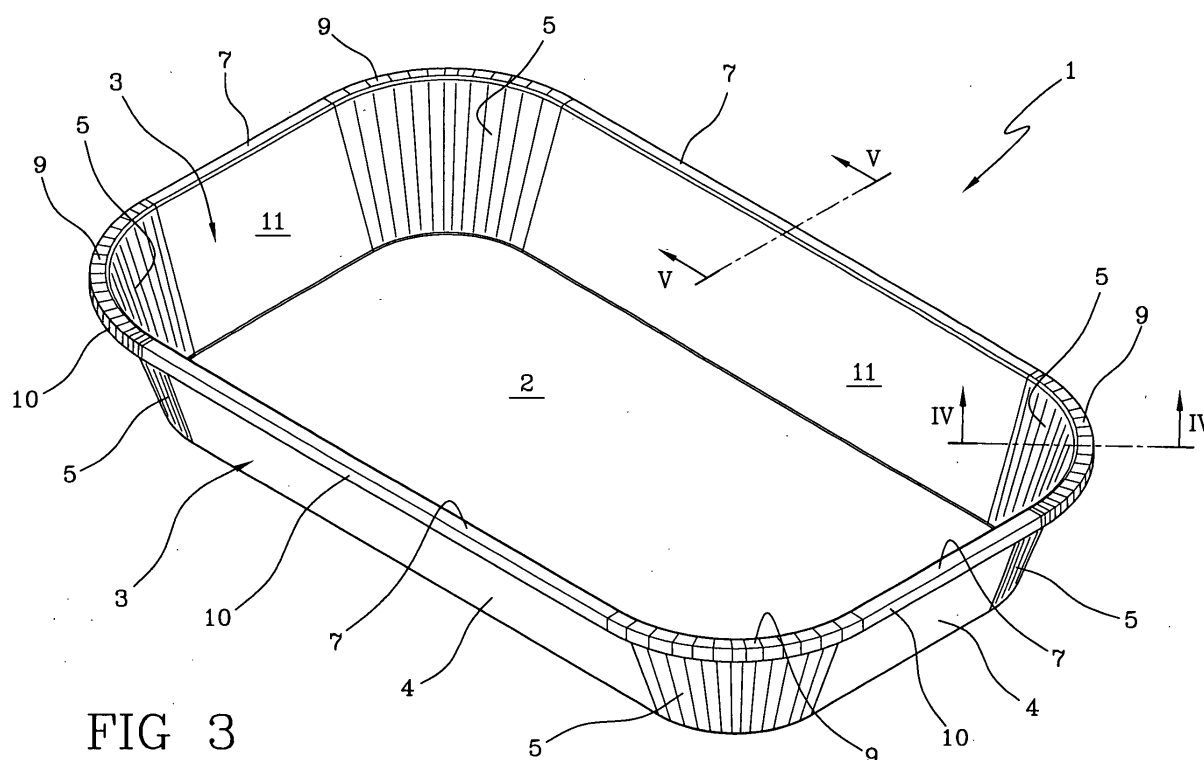


FIG 3

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Description

[0001] The present invention relates to a tray, in particular for containing foodstuffs, and to the method of producing the same. In detail, the invention pertains to a container of paper material intended for conservation and possible cooking of foods such as lasagne, pre-packaged dishes, etc.

[0002] It is known that there is on the market a great number of typologies of food containers made of paper material and adapted to allow conservation and/or cooking of products of different nature.

[0003] Well known are in particular containers defined by a flat bottom wall of substantially rectangular shape from which a side wall emerges that is adapted to delimit, in cooperation with the bottom wall, a holding space set to receive the appropriate food.

[0004] Such a holding tray is then provided, at the upper part thereof, with an outwardly-bent edge capable of defining a continuous flat surface over the whole upper periphery of the container.

[0005] The flat surface (with an extension parallel to that of the bottom wall) defined by the bent edge is susceptible of enabling closure of the holding space by use of a plastic film for example, that is heat-sealed along the whole peripheral surface.

[0006] While this tray typology obtained by a series of bending operations in succession starting from a flat sheet of paper material has been widely spread and hitherto widely used, it is not however devoid of technical and/or operating limits and drawbacks.

[0007] In fact, the containers of the described type have a weak resistance to deformations, in particular to deformations taking place at the side walls. Actually, these containers are not able to offer a satisfactory resistance against forces directed transversely of the side walls, which results in the risk that deformations due to handling of the container already filled with the foodstuff may cause escape of the product and/or worsen the aesthetic appearance of same.

[0008] The above mentioned drawbacks have been at least partly eliminated by providing a tray as previously described and by applying a further rim of paper material, by gluing, exactly close to the sealing surface so as to make the bent edge a two-layered edge and therefore increase the resistance to deformations transversely of the side wall.

[0009] This solution too however, has many drawbacks. First of all the presence of glues and elements of different nature in engagement with each other can cause pollution of the foodstuff and also enable part of the humidity contained in the food to penetrate the paper fibres wetting them and therefore greatly lowering the resistance to stresses of same.

[0010] On the other hand, it is to be noted that, from the standpoint of the manufacturing costs, arrangement of this further reinforcing element is carried out starting from a flat sheet of paper material suitably cut out only

a minimum portion of which is used whereas most of the material is to be discarded.

[0011] Accordingly, the present invention aims at substantially solving all the mentioned drawbacks.

[0012] It is a first aim of the invention to devise a tray of paper material that is provided with the necessary structure features to enable it to withstand the transverse deformations of the side walls thereof.

[0013] Another aim of the present invention is to obtain a container for foodstuffs made of paper material in which the food cannot come into contact with glues or the like and also cannot transfer its humidity to the cellulose fibres so as to maintain the mechanical-resistance features of said fibres as much as possible unimpaired.

[0014] It is a further aim of the invention to obtain a product of paper material of reduced costs, in particular by decreasing or eliminating the working rejects as much as possible.

[0015] It is a still further aim of the invention to obtain trays for containing foodstuffs that are of simple manufacture and require a limited number of manufacturing operations.

[0016] The foregoing and further aims that will become more apparent in the course of the following description are substantially achieved by a tray in particular for containing foodstuffs, and by a method for manufacture of same as recited in the appended claims.

[0017] Further features and advantages will be best understood from the detailed description of a preferred but not exclusive embodiment of the invention taken hereinafter with reference to the accompanying drawings, in which:

- Fig. 1 shows a plan development of a tray in accordance with the present invention;
- Fig. 1A shows the plan development of an alternative embodiment of a tray in accordance with the invention;
- Fig. 2 shows an intermediate passage of the production steps of the tray in accordance with the present invention;
- Fig. 3 is a view of the tray in accordance with the invention;
- Figs. 4 and 5 show a section of the side wall of the tray at a straight portion of the side wall and a curved portion of the same side wall, respectively; and
- Fig. 5A shows the section of a curved portion of a tray in accordance with an alternative embodiment of same.

[0018] With reference to the drawings, a tray in particular for containing foodstuffs has been generally identified with reference numeral 1.

[0019] The container is fully made of paper material starting from a flat sheet of the type shown in Fig. 1, as better clarified in the following.

[0020] In detail, the tray is intended for conservation

and possible cooking of foodstuffs, such as prepackaged products for example.

[0021] As can be seen from the accompanying drawings, the tray has a flat bottom wall 2 from which a side wall 3 emerges that, in cooperation with said bottom wall 2, defines a holding space 6 set to receive the appropriate food.

[0022] While not essential, bottom 2 can be of a substantially rectangular shape the sides of which are connected with each other by short curved sections.

[0023] In this way the side wall 3 emerging from said bottom will show respective straight portions 4 emerging from the straight sections of bottom 2, alternated with curved portions 5 (defining the tray corners) emerging from the respective curved sections of said bottom 2.

[0024] Since the tray is fully made starting from a flat sheet, the curved portions 5 will obviously have excess material that will be formed into pleats or the like (see Figs. 2 and 3).

[0025] Therefore, the straight and curved portions 4, 5 of the side wall 3 define an inner holding surface 11 without a break. In other words, due to the fact that the present tray is obtained starting from a flat sheet, no cracks, cuts or the like that may give rise to leakage of the product contained therein can exist on the side wall or the inner holding surface.

[0026] The upper region of the side wall 3 where the different folded edges are defined is now examined, and the following can be noticed as regards the engagement surfaces for reinforcement of the tray itself.

[0027] First of all at least one straight portion 4 of the side wall 3 comprises a flat surface 7 facing upwardly and having a flat development substantially parallel to the bottom development.

[0028] Also to be noticed is the presence of a reinforcing tab 8 (see Fig. 2 in particular) that during the tray production steps is designed to be associated at the lower part thereof with the flat surface 7, as visible in the section in Fig. 4.

[0029] The curved portion of the side wall 3 too comprises a respective flat surface 9 facing upwardly as well, and having a development parallel to the development of the bottom wall.

[0030] Obviously, due to the presence of excess material (since the tray is manufactured starting from a flat sheet of paper material), the flat surface 9 too will have respective pleated or crimped regions, or the like.

[0031] Finally, at least one straight portion 4 and one curved portion 5 of the side wall 3 will have respective outer reinforcing edges 10 folded transversely (preferably at right angles) with respect to the flat surfaces 7, 9 (Figs. 3, 4 and 5).

[0032] As can be easily understood looking at the accompanying drawings, each straight portion 4 has the respective reinforcing tab 8 joined to the respective flat surface 7 without a break; tab 8 will be then folded down against the lower side of surface 7 when the tray is assembled.

[0033] The reinforcing edge 10 too extends over the whole side perimeter of the tray without a break and in such a manner that an optimal resistance to stresses transverse to the side wall is ensured.

[0034] Therefore, taking into account the above described structure, the side wall will be in section as shown in Figs. 4 and 5. In particular, the reinforcing edge 10 will be a two-layered edge at the straight portions (see Fig. 4) and will consist of one layer alone at the curved portions 5 (see Fig. 5).

[0035] In addition, the presence of the flat surfaces 7 and 9 along the whole upper edge of the tray allows engagement of possible closing films therewith, which films are heat-sealed for conservation of the foodstuff.

[0036] Advantageously, the tray has no other elements of paper material added by gluing, stapling or the like. In other words, arrangement of suitable reinforcing rims or other elements is not required in order to define the structural-resistance features of the container or modify the container structure.

[0037] With reference to the alternative embodiment shown in Fig. 1A, reinforcing tabs 8 can be also defined that are provided with end portions 8A that once folded back, are adapted to abut against the lower side of the flat surfaces 9 defined by the curved portions. In this way the four tray corners are reinforced as well and they show a double wall, seen in section (see Fig. 5A).

[0038] After describing the invention from a structural point of view, the method of manufacturing the tray shown in Fig. 3 is the following.

[0039] First of all a flat sheet of paper material having the appropriate size and basis weight is set and a portion of the type shown in Fig. 1 is cut out therefrom.

[0040] Then a drawing operation is executed on the sheet in order to define bottom 2 and the side wall 3 emerging from said bottom. In particular, bending at least along line A in Fig. 1 is carried out. Then a bending operation along the chain line denoted at B in Fig. 1 is carried out (obviously this operation can be executed simultaneously with the preceding one) in order to define an upwardly-facing flat surface 7, 9 at an upper region of the side wall.

[0041] Once the above operations have been completed, the flat sheet has passed from the condition shown in Fig. 1 to the condition shown in Fig. 2. Under this situation, folding of a predetermined number of reinforcing tabs 8 against the lower side of the flat surface 7 is carried out at each of the straight sides (folding line C in Fig. 1). Optionally these tabs can be glued to the lower side of the flat surface 7.

[0042] Then a further bending operation at the upper region of the side wall is executed in order to obtain the reinforcing edge 10 transverse to the flat surfaces 7, 9 over the whole perimeter of the side wall 3 so that the configuration shown in Fig. 3 is reached and the finished product is obtained (folding lines D, E in Fig. 1).

[0043] Following the above described bending and folding operations, at the straight portions an edge is

obtained of the type shown in section in Fig. 4 and at the curved portions an edge is obtained of the type shown in section in Fig. 5.

[0044] The invention achieves important advantages.

[0045] It is to be pointed out first of all that the tray in reference is obtained starting from a single flat sheet of paper material. In other words, no waste of paper material exists and therefore an important reduction in the costs connected with the raw materials is obtained.

[0046] In addition, the tray is obtained by simple folding operations that could possibly be made by a single production machine during few operating steps in succession.

[0047] The structure of the tray as made allows an excellent resistance to stresses transverse to the side walls and in addition no gluing regions are present at the foodstuff-holding space.

[0048] Due to the absence of any cut, hole or the like, the paper material is inhibited from getting into contact with the humidity or water contained in the foods, which could weaken it and make the tray lose its structural features.

[0049] A further advantage consists in that the container of the invention is very practical, can be piled up and can be easily reproduced and is also provided with the necessary flat surfaces for carrying out heat-sealing of plastic closure films for conservation of the foods contained therein.

Claims

1. A tray of sheet paper material, in particular for containing foodstuffs, comprising:

- a bottom (2);
- a side wall (3) defined by straight portions (4) and curved portions (5) and emerging from the bottom, said side wall defining, in cooperation with the bottom itself, a holding space (6) facing upwardly under use conditions of the tray, **characterised in that** at least one straight portion (4) of the side wall (3) has an upper region comprising a first upwardly-facing flat surface (7) and a reinforcing tab (8) associated with the first flat surface (7) in the assembled conditions of the tray, at least one curved portion (5) of the side wall comprising an upwardly-facing flat surface (9), at least one straight portion (4) and one curved portion (5) of the side wall (3) having respective reinforcing edges (10) folded transversely of the flat surfaces (7, 9), said bottom (2), side wall (3), straight portions (4), curved portions (5), flat surfaces (7, 9), tabs and reinforcing edges (8, 10) being defined by the same sheet of paper material.

2. A tray as claimed in claim 1, **characterised in that**

the straight and curved portions (4, 5) of the side wall (3) define an inner holding surface (11) without a break.

3. A tray as claimed in claim 1, **characterised in that** the bottom (2) is of a substantially rectangular shape the sides of which are connected with each other by curved sections.
4. A tray as claimed in anyone of the preceding claims, **characterised in that** the flat surfaces (7, 9) of the straight (4) and curved (5) portions define a surface without a break and are preferably set to receive a heat-sealed film for closure of the holding space.
5. A tray as claimed in claim 3, **characterised in that** at least the straight portions (4) emerging from the major sides of the bottom (2) and preferably all the straight portions (4), comprise said first upwardly-facing flat surface (7) and the reinforcing tab (8) associated with the first flat surface (7) in an assembled condition of the tray.
6. A tray as claimed in claim 3, **characterised in that** all the curved portions emerging from the curved sections of the bottom (2) comprise the upwardly-facing flat surface (9).
7. A tray as claimed in anyone of the preceding claims, **characterised in that** the flat surface (7) and reinforcing tab (8) of each straight portion (4) are joined together without a break.
8. A tray as claimed in anyone of the preceding claims, **characterised in that** the reinforcing edge (10) is defined along the whole upper perimeter of the tray and is without a break over the whole extension thereof.
9. A tray as claimed in anyone of the preceding claims, **characterised in that** the reinforcing edge (10) has a double wall at the straight portions (4).
10. A tray as claimed in anyone of the preceding claims, **characterised in that** it is fully made starting from a single sheet of paper material.
11. A tray as claimed in anyone of the preceding claims, **characterised in that** it has no further elements of paper material added thereto by gluing, stapling or the like to define the structure or structural resistance features of the tray.
12. A tray as claimed in anyone of the preceding claims, **characterised in that** the reinforcing tab (8) comprises end portions (8A) designed to abut against the lower side of the flat surfaces (9) of the curved portions (5).

13. A method of making a tray of sheet paper material, in particular for containing foodstuffs, **characterised in that** it comprises the following steps:

- setting a flat sheet of paper material; 5
- carrying out a drawing operation on the sheet to define a bottom (2) and a side wall (3) identified by straight portions (4) and curved portions (5) and emerging from the bottom to define, in cooperation with the bottom itself, a holding space (6) turned upwardly under use conditions of the tray; 10
- carrying out a bending operation to define an upwardly-facing flat surface (7, 9) at an upper region of the side wall (3); 15
- folding a predetermined number of reinforcing tabs (8) at the flat surface (7) of the straight portions (4); and
- carrying out a folding operation at an upper region of the side wall to obtain a reinforcing edge (10) transverse to the flat surfaces (7, 9) along the whole perimeter of the side wall (3). 20

14. A method as claimed in claim 13, **characterised in that** it further comprises a step of gluing the reinforcing tabs (8) against the lower side of the flat surfaces (7). 25

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FIG 1

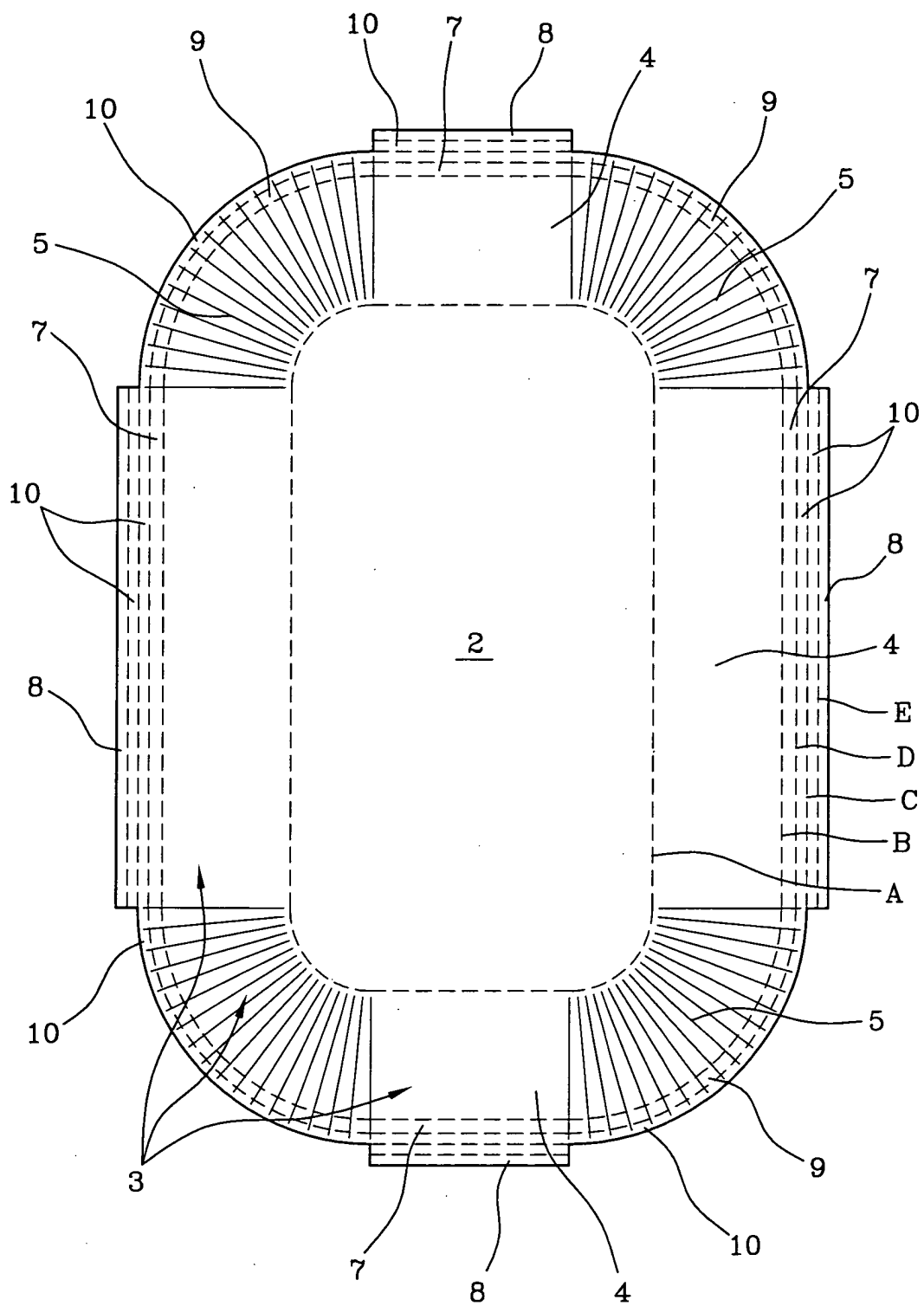
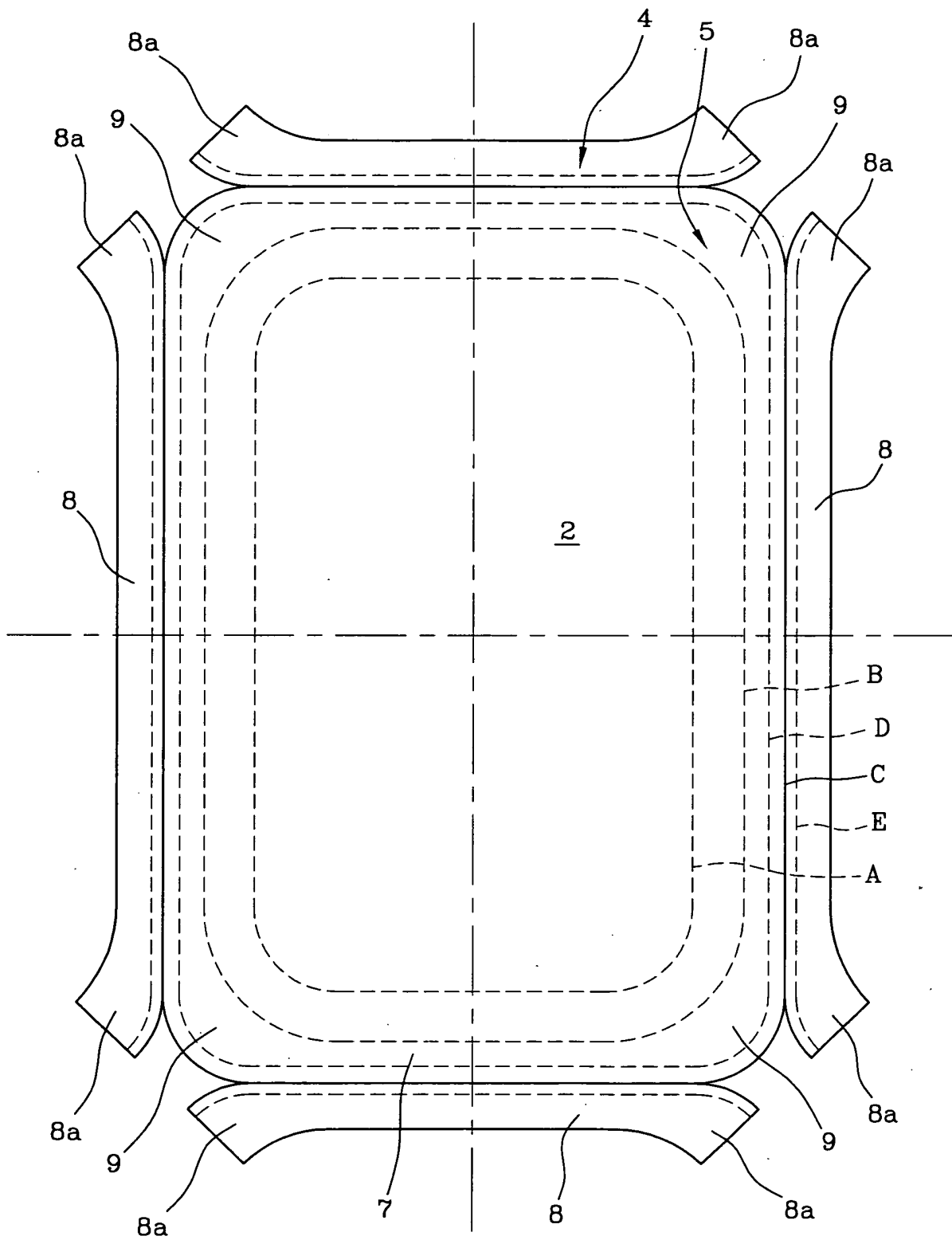


FIG 1A



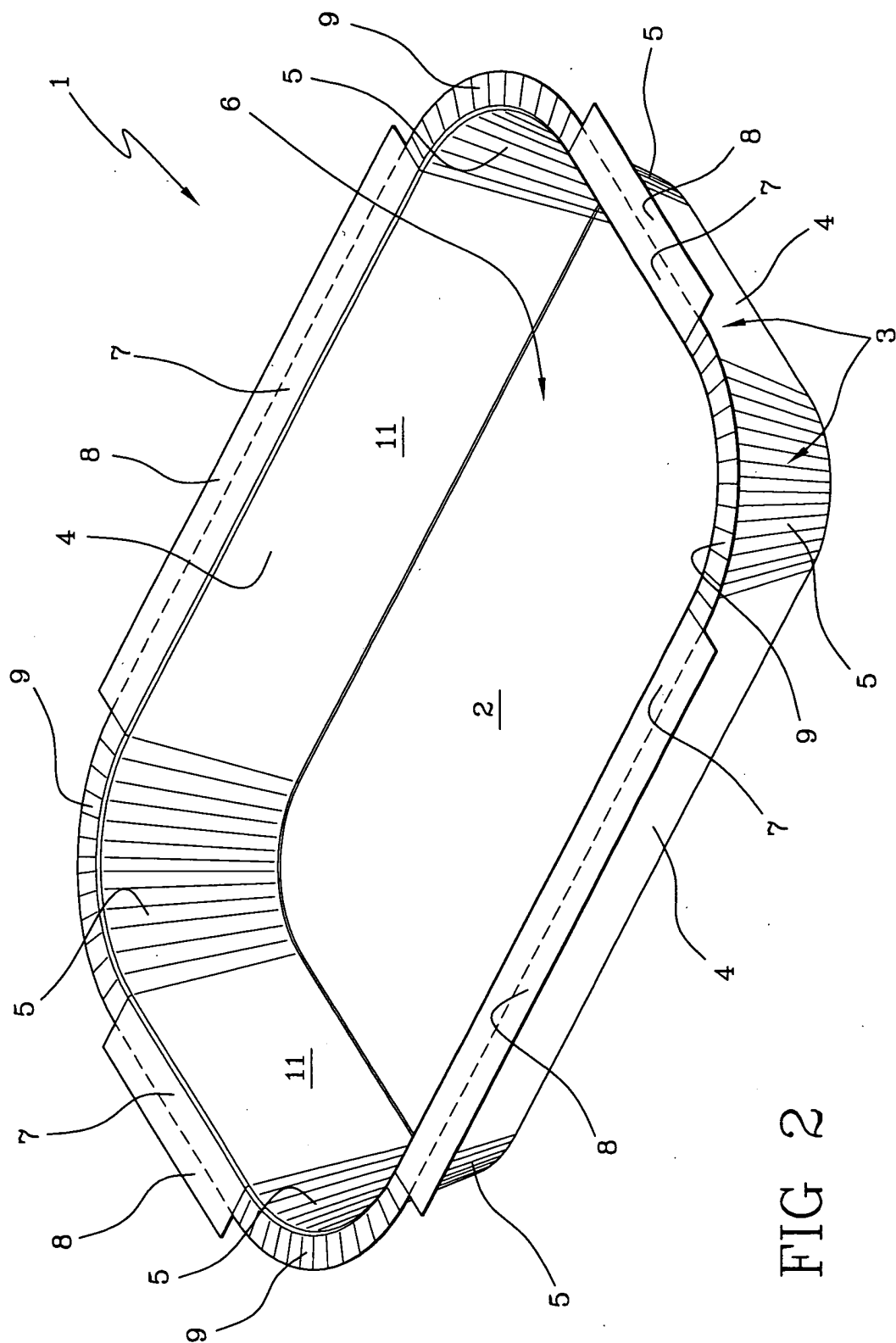


FIG 2

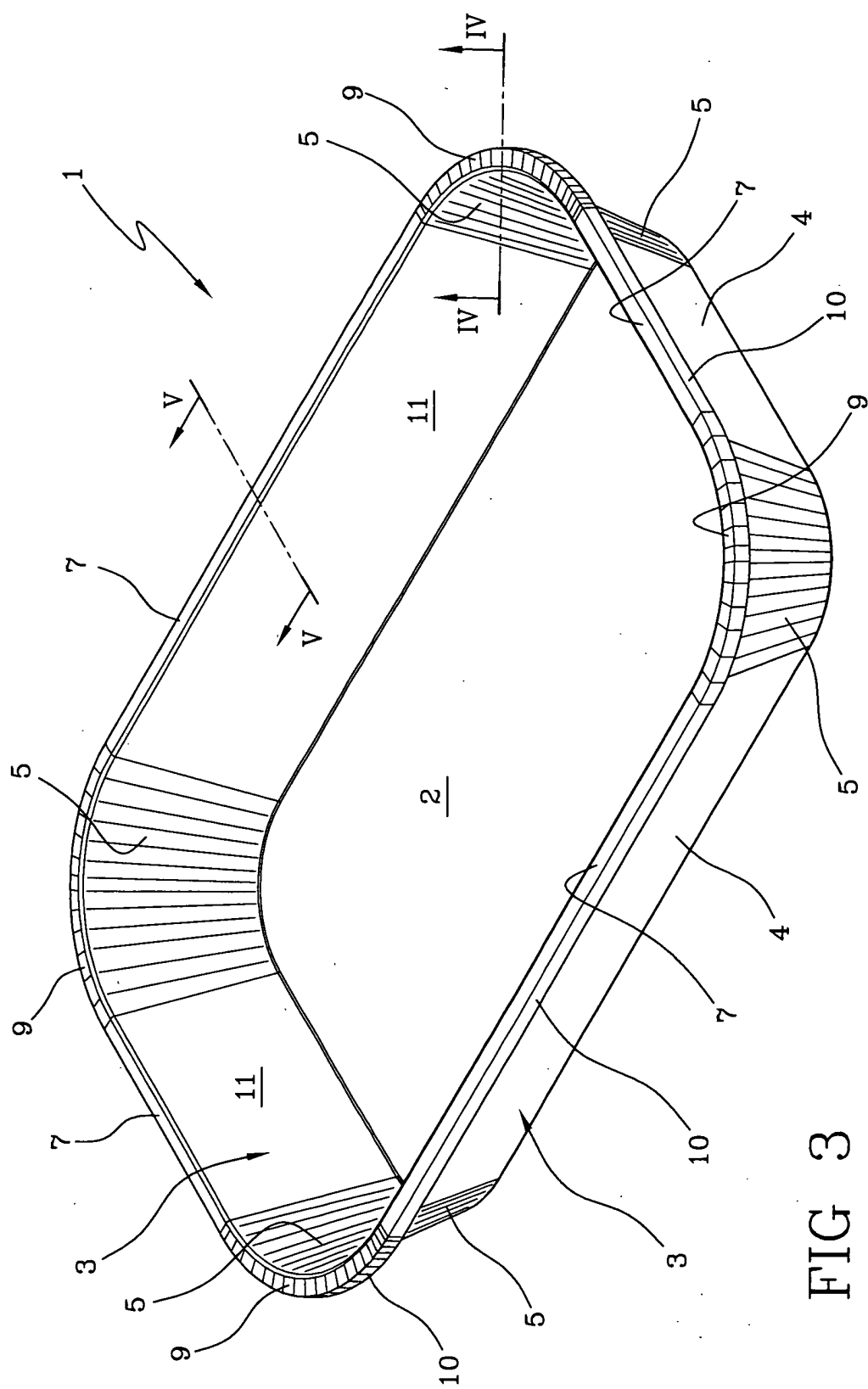


FIG 3

FIG 4

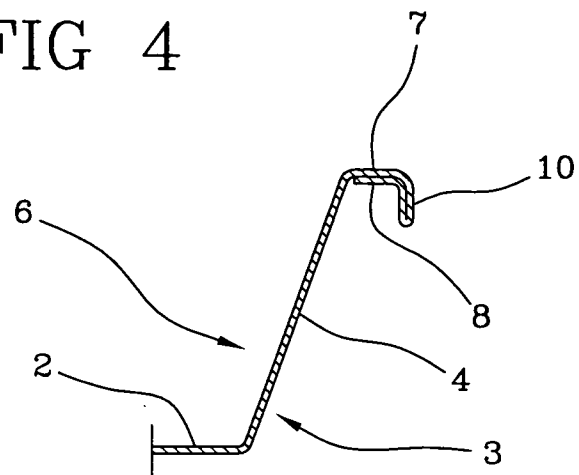


FIG 5

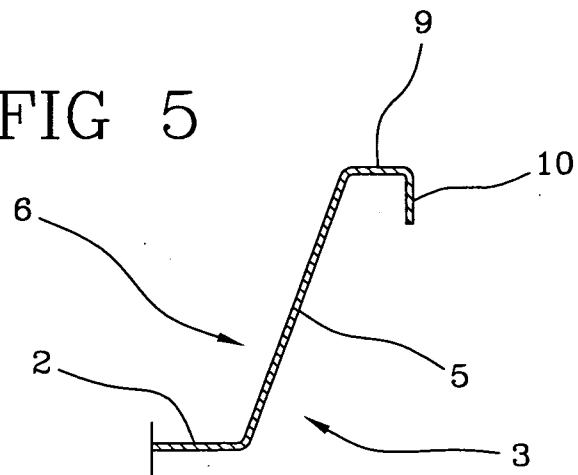
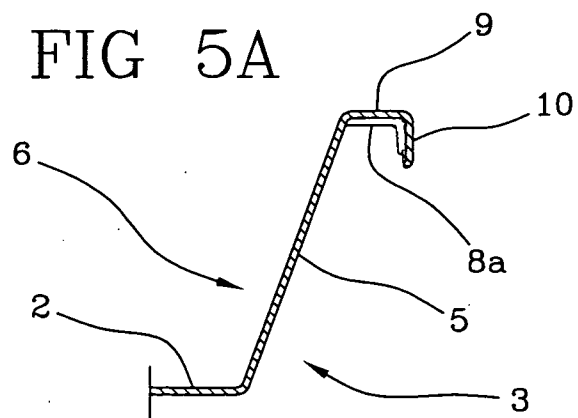


FIG 5A





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 00 1046

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)
X	FR 2 276 994 A (ESSELTEPACK AB) 30 January 1976 (1976-01-30)	1-3,5-7, 9-11	B65D5/44 B65D5/24
Y	* page 1, paragraph 1 *	4,8,12	
A	* page 3, paragraph 3; figures 1,2 *	13,14	

Y	US 3 038 634 A (CHEELEY WILLIAM E) 12 June 1962 (1962-06-12)	4,8	
A	* column 4, line 15 - line 42; figures 1-7 *	1-3,5-7, 9-14	

Y	US R E36 158 E (FORBES JR HAMPTON E) 23 March 1999 (1999-03-23)	12	
	* figure 5 *		

A	US 6 092 720 A (KAROLYI OSKAR) 25 July 2000 (2000-07-25)	1-14	
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A	US 2 296 808 A (CHAPLIN MERIE P) 22 September 1942 (1942-09-22)	1	
	* figure 5 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D
Place of search Munich		Date of completion of the search 16 April 2004	Examiner Appelt, L
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			

EPO FORM 1503 03.82 (P04C01)

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

EP 04 00 1046

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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