



(11)

EP 2 853 178 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
01.04.2015 Bulletin 2015/14

(51) Int Cl.:
A47F 5/11 (2006.01)

(21) Application number: **14181399.8**

(22) Date of filing: **19.08.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(71) Applicant: **Pozo Negro Beheer B.V.**
6019 AB Wessem (NL)

(72) Inventor: **Hol, Johannes Leonardus Martinus**
6101 AE Echt (NL)

(74) Representative: **Patentwerk B.V.**
Julianaplein 4
5211 BC 's-Hertogenbosch (NL)

(30) Priority: **30.09.2013 NL 2011530**

(54) **Foldable display, being foldable to a unit with an extra small surface area**

(57) The invention relates to a display, comprising a three panels (10,20,30), at least two trays (11,31), foldably connected to the panels (10,20,30), a connecting structure connecting the outer panels (10,30) and surrounding the trays (11,31), the display being adapted to be in a expanded position or in a contracted position, in the expanded position the panels (10,20,30) extend in the vertical direction and the trays (11,31) extend in the substantial horizontal direction, in the contracted position, the panels (10,20,30) and the trays (11,31) extend mutually parallel and adjacent, a fold (18a,24a,24b,39) has been applied in the middle panel (20) and in one of the outer panels (10,30), at least a cut (38,48a) has been applied in one of the outer panels (10,30) and that in the contracted position of the display, the folds (18a,24a,24b,39) mutually coincide and the cut (38,48a) is located in the vicinity of the folds (18a,24a,24b,39) to allow folding of the display from the contracted position to a folded position.

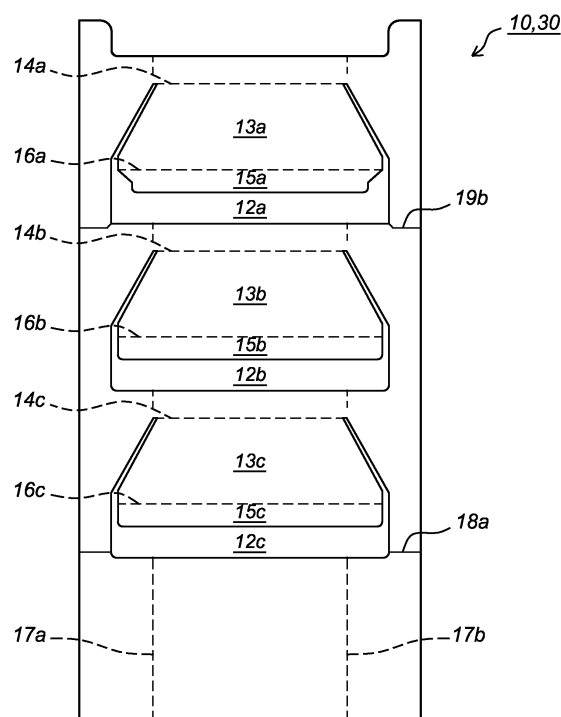


Fig. 1

Description

[0001] The present invention relates to a display, as being used in shops to display goods to draw extra attention to those products. Such displays are known since a long time.

[0002] More in particular the invention relates to a display, comprising a front panel, a middle panel, a rear panel, at least two trays, each tray being foldably connected to the middle panel and to the front panel or to the rear panel respectively, a connecting structure connecting the front panel to the rear panel and surrounding the trays and the middle panel, wherein the display is adapted to be in a expanded position or in a contracted position, wherein in the expanded position the front panel, the middle panel and the rear panel extend in the vertical direction and the trays extend in the substantial horizontal direction and wherein in the contracted position, the front panel, the middle panel, the rear panel and the trays extend mutually parallel and adjacent.

[0003] Displays of this kind are being produced and marketed by Holbox BV in the Netherlands, and these displays are marketed as '2 second retail display'. This display can, starting from the contracted position be erected to the expanded position in a very short time. Further, the trays can carry substantial weights, up to 20 kg per double tray allowing a wide variety of goods to be displayed. In its most common embodiment this display has four pairs of trays. However the display in its contracted position, in which it usually sent to the retailers, takes a substantial surface area, making it impossible to carry in cars of an average size, requiring distribution of the displays by lorry, van or estate car.

[0004] The aim of the invention is to provide a display of the kind referred to above, which - in its contracted position - takes less surface area, so that it can be transported in a normal car of average size.

[0005] This aim is reached by a display of the kind referred to above, wherein at least a first fold has been applied in the middle panel and in one of the front panel and the rear panel, all first folds extending substantially parallel and substantially horizontal in the expanded position, at least a first cut has been applied in the other of the front panel and the rear panel, and wherein in the contracted position of the display, the first folds mutually coincide and the first cut is located in the vicinity of the first folds to allow folding of the display from the contracted position to a folded position.

[0006] It is surprising that despite the presence of the cuts and folds in the panels, which inherently weaken the strength of the panels, the display made foldable according to these features is sufficiently strong for normal use. It is noted that the thickness of several millimetres the material normally used for these panels requires folding for the inner layers of the fold, making folding of the more outermost layer impossible due to the combined stiffness. The present invention solves this problem by cutting the outer layers of the fold.

[0007] Although the presence of a single fold leads to a substantial reduction of the surface area of the folded display, of theoretically 50%, the application of a second fold reduces said surface area even more. Hence a preferred embodiment provides a display of the kind referred to above, wherein at least a second fold has been applied in the middle panel and in one of the front panel and the rear panel, all second folds extending mutually substantially parallel and substantially parallel to the first fold, at least a second cut has been applied in the other of the front panel and the rear panel and wherein in the contracted position of the display, the second folds mutually coincide and the second cut is located in the vicinity of the second folds to allow folding of the display from the folded in position to a double folded in position. Theoretically it is possible to reduce the surface area of the folded display to 33% of that of the prior art display. It is attractive to have the folds arranged such that the both distal ends of the display fold in different directions, avoiding the a double layer on one side of the folded display.

[0008] The products located in and on the display must be visible; that is one of the main requirements for the display. Hence the display comprises apertures in the front panel and in the rear panel to make the products located on the trays visible. According to a further preferred embodiment a number of apertures has been provided in the front panel and in the rear panel, wherein at least one of the folds extend through an aperture in the front panel and the rear panel respectively. The coincidence of the apertures and the folds and cuts respectively causes the folds and cuts to extend only through the parts of the front and rear panels not taken up by the apertures. Despite this weakening the display is surprisingly sufficiently strong.

[0009] To be able to look through the middle panel, and to make the products visible which are located on the rear trays, it is preferred to make apertures in the middle panel as well. Consequently another embodiment provides the feature that in the middle panel a number of apertures has been provided and that at least one of the folds extend through the aperture in the middle panel.

[0010] There are several possibilities to provide a connecting structure connecting the front panels with the rear panel. According to a preferred embodiment, allowing the use of the same material of which the panels are made, it is preferred that the front and the rear panels each comprise a middle portion and a pair of side flaps each connected by a fold to the respective middle portion, said folds extending vertical in the expanded position, the first folds and first cuts extending in at least the side flaps of the front and rear panels, and that the connecting structure comprises two side panels, each comprising two side panel sections mutually connected by at least one fold extending vertical in the expanded position of the display, each of these side panel sections extending adjacent to the side flaps and being glued to the side flaps.

[0011] As stated before, the strength of the display is

of utmost importance. To further increase the strength in the expanded position, it is preferred that in the contracted position the first cuts in the side flaps of the front panels, the rear panels respectively, extend at least partially at a distance from the first folds in the direction of the plane of the flaps from the first folds. This feature leads to a deviation of the cuts from the folds. To allow proper folding both ends of the cuts must coincide with the folds. The deviation of the cut allows a part of one of the parts adjacent to the cut to protrude beyond the fold. This part leads to a strengthening of the joint formed by the folds as this part is adjacent to and parallel to the parts at the other side of the fold.

[0012] The protruding parts mentioned above, protrude in the folding position of the display. To counteract damage to these protruding parts, it is advantageous when the first cuts have a shape, deviating from a single straight line.

[0013] To take account of the accumulated thicknesses of the material of which the display is made, it is preferred that the fold in the side panels each is composed of two parallel folds enclosing a strip. This strip creates sufficient distance between the upper and lower layers of the display in the contracted position for the intermediate layers in this position.

[0014] The middle panel is subjected to compressive forces, which may lead, due to the presence of the cuts and folds in the middle panel, make said flat panel vulnerable for buckling. To avoid possible buckling and to maintain the ability to carry a substantial load on the trays, a preferred embodiment provides the feature that locking means have been provided at the upper half of the middle panel, which locking means are adapted to be coupled to locking means provided at both of the side panels in the expanded position. These locking means transfer the compressive forces from the middle panel to the side panel, which, due to their folds extending in the direction of the forces, are better suited for transfer of these forces to the ground.

[0015] A simple and cheap embodiment provides the feature that the locking means in the middle panel comprise a notch in the side edge of the middle panel and that the locking means in the side panels comprise two cuts in each of the side panels intersecting the fold made therein, allowing sections of the side panels located between the cuts at both sides of the folds to be folded towards the middle panel and into the notches in the middle panel into locking relation with the middle panel. This embodiment only requires two cuts to be made, so that the costs thereof are low.

[0016] Fixation in the locking position is improved when in the upper cuts in the side panels downward pointing notches have been provided and in the locking position of said sections the notches carry the upper edges of the notches made in the middle panels.

[0017] The attractiveness of the display is further enhanced by a top panel extending substantially in vertical direction and having two legs, each extending in the

space between one of the side panels and the middle panel and extending into the space between the sections of the side panels folded into locking relation with the middle panel and the apertures in the side panels left open by said sections.

[0018] The presence of the cuts and folds weakens the structure of the display, despite all features discussed above. To provide the structure with sufficient strength, it is preferable if all panels are made of cardboard, in particular corrugated board of the double E quality.

[0019] The present invention also provides a method of converting a display according to any of the preceding claims from the folded position to the expanded position, comprising the steps of unfolding the display from the folded position to the contracted position, gripping the upper parts of the side panels and raising the contracted display to its upright position, and raising the side panels further and allowing the display to unfold from the contracted position to the expanded position.

[0020] Preferably after performing the method discussed above, it is preferred when subsequently the locking means are brought into locking if the display comprises locking means.

[0021] Subsequently the present invention will be elucidated with the help of the following drawings wherein depict:

- Figure 1 : a plan view of a broadsheet of a front panel of a display according to the invention;
- Figure 2 : a plan view of a broadsheet of a tray of the same display;
- Figure 3 : a plan view of a broadsheet of a middle panel of the same display;
- Figure 4 : a plan view of a broadsheet of a side panel of the same display;
- Figure 5 : a horizontal cross section view of an assembled display;
- Figure 6 : a vertical cross section view according to the line VI-VI in figure 5;
- Figure 7 : a vertical cross section view according to figure 6, in an intermediate position between the contracted position and the folded position;
- Figure 8 : a diagram showing the broadsheet of a header optionally to be located on the display;
- Figure 9 : a cross section of a detail of a side panel, together with a part of the centre panel resting on the side panel; and
- Figure 10 : a diagram of a detail of a side panel.

[0022] The front panel 10 depicted in figure 1, is combined with a tray 11 depicted in figure 2, a middle panel 20 as depicted in figure 3, a tray 31 identical to the tray 11 depicted in figure 2 and a rear panel 30, substantially identical to the front panel 10. Finally two side panels 40 are applied. Initially the panels 10, 20, 30, and 40 and the trays 11 and 31 will be discussed, subsequently the

way they are combined and finally the functioning of the display will be discussed. In the following discussion of the panels the expressions 'vertical' and 'horizontal' refer to the position of the panels in the expanded position of the display. All panels are preferably but not necessarily made of cardboard, preferably from cardboard of the quality 'double E'.

[0023] The front panel 10 is of substantial rectangular shape and has the height of the expanded display, and a width which is slightly larger than the width of the display. In the front panel 10 three substantial rectangular apertures 12a, 12b, 12c have been provided, of which the upper corners are chamfered. In each of the apertures 12a, 12b, 12c a tray 13a, 13b, 13c has been left, connected at its upper side to the main body of the front panel 10 by a fold 14a, 14b, 14c. At its lower side, each of the trays 13a, 13b, 13c comprise a glue strip 15a, 15b, 15c connected to the tray by a fold 16a, 16b, 16c. Two vertical folds 17a and 17b have symmetrically been provided in the front panel 10. According to the invention a first horizontal fold 18a has been provided, extending through the lower aperture 12c, just as a second horizontal cut 19b extending through the upper aperture 12a.

[0024] The rear panel 30 is, as noted before, substantially identical to the front panel 10, with the exception that in the rear panel 30 the first horizontal fold 18 has been replaced by a first horizontal cut 38 and the second horizontal cut 19 has been replaced by a first horizontal fold 39. Further in the rear panel 30 three substantial rectangular apertures 32a, 32b, 32c have been provided, of which the upper corners are chamfered. In each of the apertures 32a, 32b, 32c a tray 33a, 33b, 33c has been left, connected at its upper side to the main body of the rear panel 30 by a fold 34a, 34b, 34c. At its lower side, each of the trays 33a, 33b, 33c comprise a glue strip 35a, 35b, 35c connected to the tray by a fold 36a, 36b, 36c. Two vertical folds 37a and 37b have symmetrically been provided in the rear panel 30.

[0025] Figure 2 shows the single tray 11, completely identical to the tray 31 and being substantially identical to the trays 13 and 33. The tray 11 comprises a lower glue strip 11a, separated from the rest of the tray 11 by a fold 11b and an upper glue strip 11c separated from the rest of the tray by a fold 11d. In the first steps of the assembly the upper glue strips 11a of the trays 11 are glued to the part of the front panel 10 directly under the lower aperture

[0026] Figure 3 depicts the middle panel 20, having a substantial rectangular shape, wherein three rectangular apertures 21 have been provided, having the same pitch as the apertures 12, 32 in the front and rear panels 10, 30. At the height of the apertures 21a, 21b, 21c corresponding recesses 22a, 22b, 22c have been provided at both sides of the middle panel 20. A vertical fold 24a, 24b extends through both of the vertical strips between the apertures 21 and recesses 22 respectively. Two vertical cuts 25, 26 extend through the upper and the lower respective apertures 21a, 21c. In the upper part of each of

the vertical strips between the apertures 21 and the recesses 22, a small aperture 27 has been provided, symmetrically respective to the vertical folds 24. Before assembly of all panels, the middle panel 20 is folded over the folds 24a, 24b respectively, so that the lateral strips of the middle panel 20, together with adjacent parts of the panel between the apertures 21a, 21b, 21c have a double thickness to increase their strengths.

[0027] Figure 4 shows a side panel 40 having also a substantial rectangular shape. The side panel 40 comprises two vertical folds 41 in the vicinity of the lateral edges of the side panel 40, allowing the resulting flaps 42 to be folded over to double the thickness of the lateral parts of the side panel. Further the panels comprises two central vertical folds 43 enclosing a strip 44 extending centrally in the panel 40. In the upper part of the panel, two small horizontal cuts 45 and 46 have been made intersecting the two central folds 43. These two cuts enclose two sections 47a and 47b of the panel 40. Finally, to allow the folding of the assembled display, a first horizontal cut 48a extends over the right hand side of the side panel 40, which continues over the left hand side of the panel as a first fold 48b. On a lower level a second horizontal cut 49a extends over the left hand side of the side panel 40, extending as a second fold 49b in the right hand side of the side panel 40.

[0028] Before assembling the display, the trays 11, 31 are glued with their glue strips 11c, 31c respectively to the parts of the front panels 10, 30 respectively, directly under the lower apertures 12c, 32c respectively. Further the middle panel 20 is folded over the folds 24a, 24b respectively, and glued to the central parts of the middle panel 20. Finally the lateral flaps 42 of the both side panels 40 are folded over and glued to the central parts of the side panels. All panels are now ready to be assembled.

[0029] Initially the front panel 10 is connected to the middle panel 20 by glueing the glue strips 15a, 15b, 15c and 11a to the parts of the middle panel 20 above, between, respectively under the apertures 21a, 21b, 21c respectively. After the glue has been set, the combination of the two resulting panels is reversed and the rear panel 30 is connected to the middle panel 20 by glueing the glue strips 35a, 35b, 35c and 31a to the parts of the middle panel 20 above, between, respectively under the apertures 21a, 21b, 21c respectively. Subsequently lateral parts of both side panels 40 are glued to the lateral parts of the rear panels and after setting of the glue, the resulting assembly is turned over. Then the sideways protruding sections of both side panels 40 are folded over the central folds 43 towards the centre, and the lateral sections of said side panels 40 are glued to the lateral parts of the front panel 10.

[0030] A horizontal cross section of the resulting assembly is shown in figure 5. In this cross section the thickness of the panels 10, 20, 30, 40 is represented thicker than in reality to increase clarity. It will be clear that the cross section is taken at a strip of material between two

apertures 21 in the middle panel 20, so that the lower trays 11, 31 are not visible in this view.

[0031] Figure 6 shows a cross sectional view over the line VI-VI in figure 5. This vertical cross section is taken in the contracted position of the display. It shows the presence of the cuts and folds made to allow folding of the display.

[0032] The view of figure 7 is equivalent to figure 6, but in a position between the folded position and the contracted position. It appears from this view that there are two 'hinges' formed by folds, which have a different axis. The fact that these folds are in positions where not all layers overlap, together with the flexibility of the material used for the display allows nevertheless a proper folding.

[0033] Figure 8 shows in the header, which is preferably made from the same material as the diagram the display in the folded position. The header 60, which is known from prior art, comprises a substantially rectangular part 61, with two legs 61. Two folds 63 have been applied in each of the legs 62 to allow clamping of the legs on the display according to the present invention.

[0034] Figure 9 shows a horizontal cross section of a detail of a side panel 40, from which the locking between the middle panel 20 and the side panels 40 appears. The side panel depicted in this drawing has its sections 47 folded inward, into the aperture 27 in the middle panel 20. Consequently the upper wall of the aperture 27, and therewith the middle panel 20 is suspended on the sections 47, which are of course also present at the other side of the display. Further this drawing also shows the legs 62 of the header 50 inserted into the space enclosed formed by the side panels 40 and the sections 47 thereof.

[0035] Finally figure 10 shows a diagram of a detail of one of the side panels 40, showing the linear fold and the non linear cut. Of course it would have been possible to use a linear cut as well, but the curved cut has the advantage of an extra contact surface between the parts of side panel at both sides of the cut, leading to more stability.

Claims

1. Display, comprising;

- a front panel;
- a middle panel;
- a rear panel;
- at least two trays, each tray being foldably connected to the middle panel and to the front panel or to the rear panel respectively;
- a connecting structure connecting the front panel to the rear panel and surrounding the trays and the middle panel;
- wherein the display is adapted to be in an expanded position or in a contracted position;
- wherein in the expanded position the front panel, the middle panel and the rear panel extend

in the vertical direction and the trays extend in the substantial horizontal direction;

- wherein in the contracted position, the front panel, the middle panel, the rear panel and the trays extend mutually parallel and adjacent;

characterized in

- **that** at least a first fold has been applied in the middle panel and in one of the front panel and the rear panel, all first folds extending substantially parallel and substantially horizontal in the expanded position;
- **that** at least a first cut has been applied in the other of the front panel and the rear panel; and
- **that** in the contracted position of the display, the first folds mutually coincide and the first cut is located in the vicinity of the first folds to allow folding of the display from the contracted position to a folded position.

2. Display as claimed in claim 1, characterized in

- **that** at least a second fold has been applied in the middle panel and in one of the front panel and the rear panel, all second folds extending mutually substantially parallel and substantially parallel to the first fold;
- **that** at least a second cut has been applied in the other of the front panel and the rear panel; and
- **that** in the contracted position of the display, the second folds mutually coincide and the second cut is located in the vicinity of the second folds to allow folding of the display from the folded position to a double folded in position.

3. Display as claimed in claim 1 or 2, characterized in that in the front panel and in the rear panel a number of apertures has been provided and that at least one of the folds extend through an aperture in the front panel and the rear panel respectively.

4. Display as claimed in claim 3, characterized in that in the middle panel a number of apertures has been provided and that at least one of the folds extend through the aperture in the middle panel.

5. Display as claimed in one of the claims 1-4, characterized in

- **that** the front and the rear panels each comprise a middle portion and a pair of side flaps each connected by a fold to the respective middle portion, said folds extending vertical in the expanded position, the first folds and first cuts extending in at least the side flaps of the front and rear panels, and

- **that** the connecting structure comprises two side panels, each comprising two side panel sections mutually connected by at least one fold extending vertical in the expanded position of the display, each of these side panel sections extending adjacent to the side flaps and being glued to the side flaps.
6. Display as claimed in claim 5, **characterized in that** in the contracted position the first cuts in the side flaps of the front panels, the rear panels respectively, extend at least partially at a distance from the first folds in the direction of the plane of the flaps from the first folds.
7. Display as claimed in claim 6, **characterized in that** the first cuts have a shape, deviating from a single straight line.
8. Display as claimed in claim 5, 6 or 7, **characterized in that** the fold in the side panels each is composed of two parallel folds enclosing a strip.
9. Display as claimed in any of the claims 5-8, **characterized in that** locking means have been provide at the upper half of the middle panel, which locking means are adapted to be coupled to locking means provided at both of the side panels in the expanded position.
10. Display as claimed in claim 9, **characterized in that** the locking means in the middle panel comprise a notch in the side edge of the middle panel and that the locking means in the side panels comprise two cuts in each of the side panels intersecting the fold made therein, allowing sections of the side panels located between the cuts at both sides of the folds to be folded towards the middle panel and into the notches in the middle panel into locking relation with the middle panel.
11. Display as claimed in claim 10, **characterized in that** in the upper cuts in the side panels downward pointing notches have been provided and in the locking position of said sections the notches carry the upper edges of the notches made in the middle panels.
12. Display as claimed in claim 10 or 11, **characterized by** a top panel extending substantially in vertical direction and having two legs, each extending in the space between one of the side panels and the middle panel and extending into the space between the sections of the side panels folded into locking relation with the middle panel and the apertures in the side panels left open by said sections.
13. Display as claimed in any of the preceding claims,
- characterized in that** all panels are made of cardboard, in particular corrugated board of the double E quality.
14. Method of converting a display according to any of the preceding claims from the folded position to the expanded position, comprising the steps of:
- unfolding the display from the folded position to the contracted position ;
 - gripping the upper parts of the side panels and raising the contracted display to its upright position;
 - raising the side panels further and allowing the display to unfold from the contracted position to the expanded position.
15. Method as claimed in claim 14, performed on a display as claimed in claim 9, wherein subsequently the locking means are brought into locking.

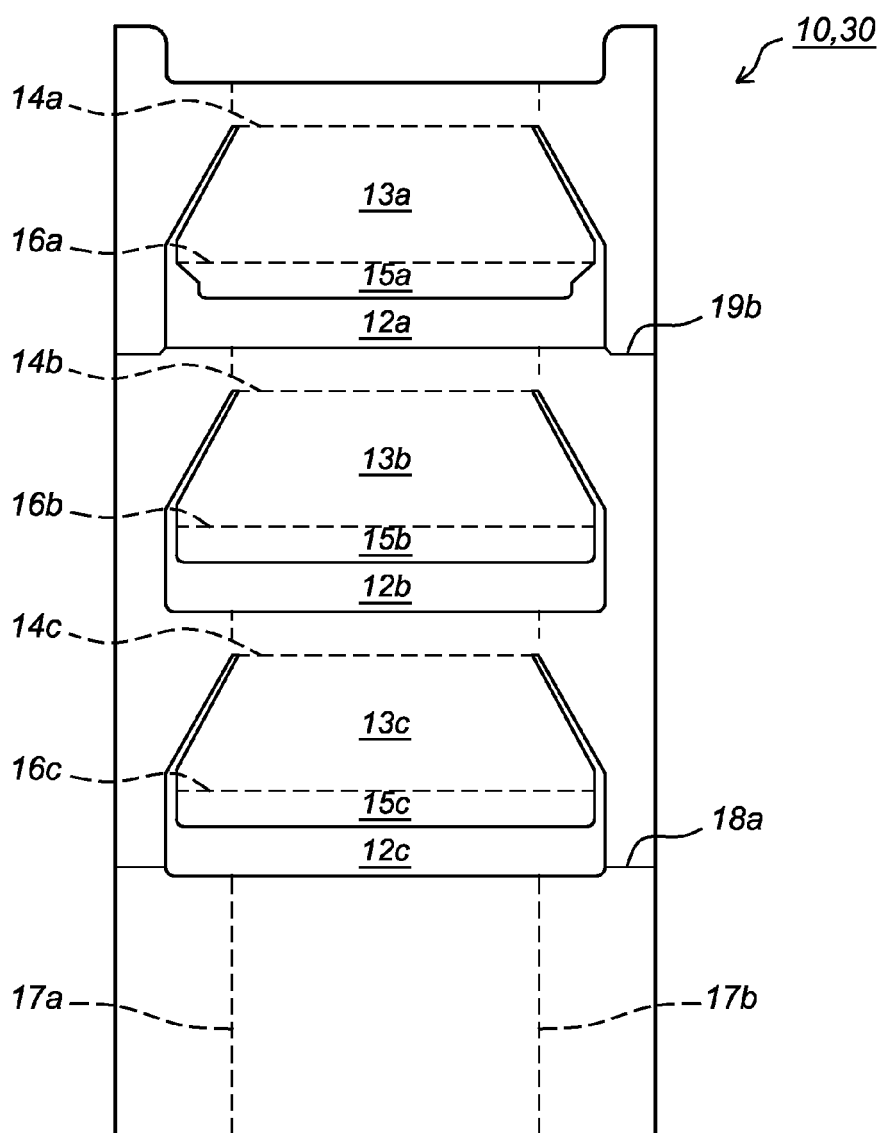


Fig. 1

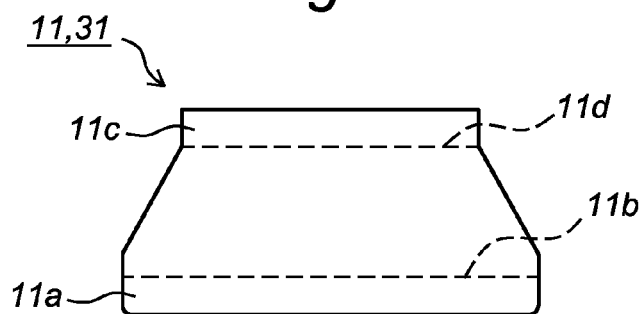


Fig. 2

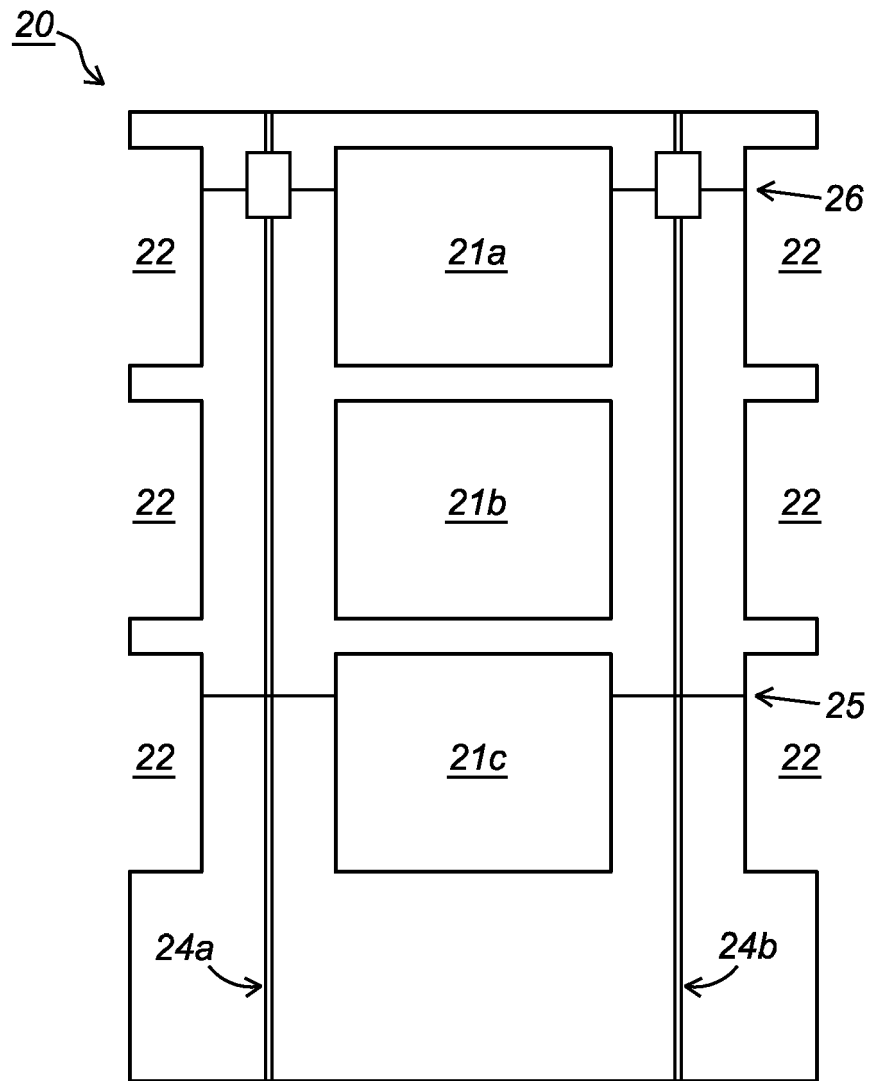


Fig. 3

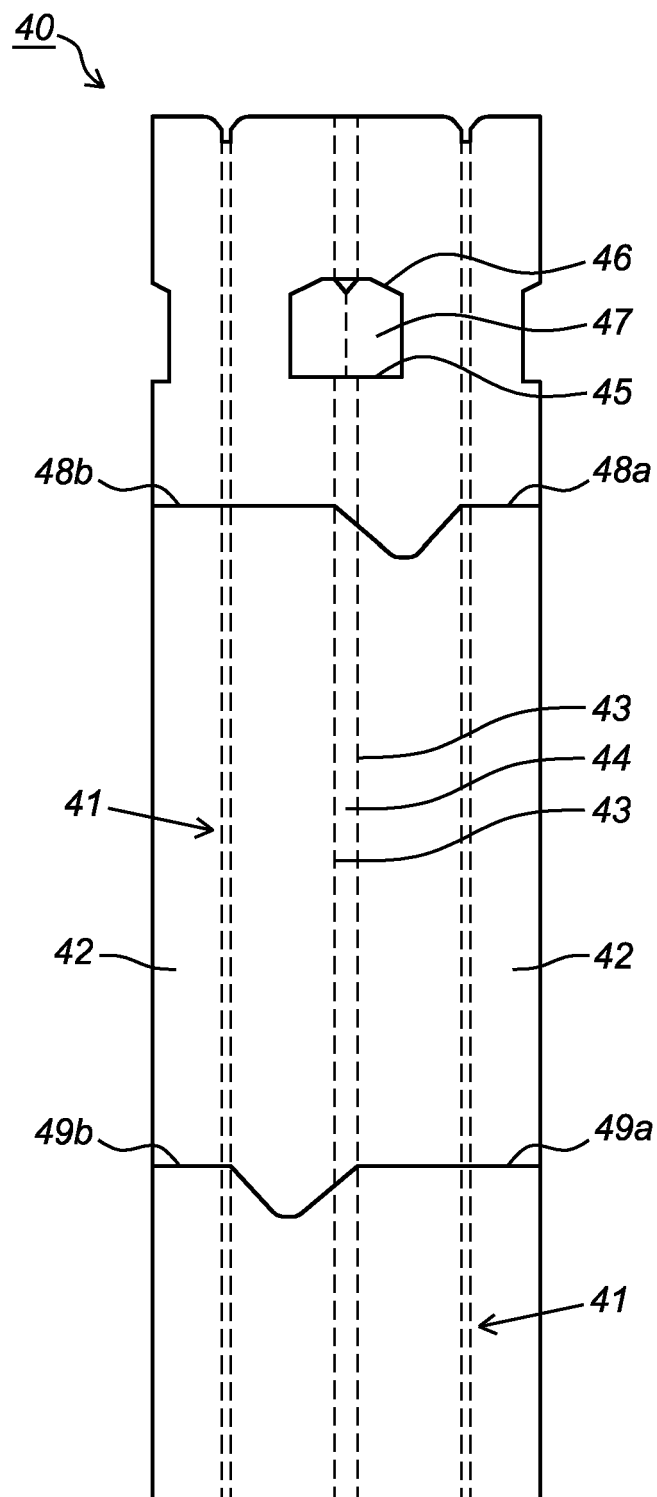


Fig. 4

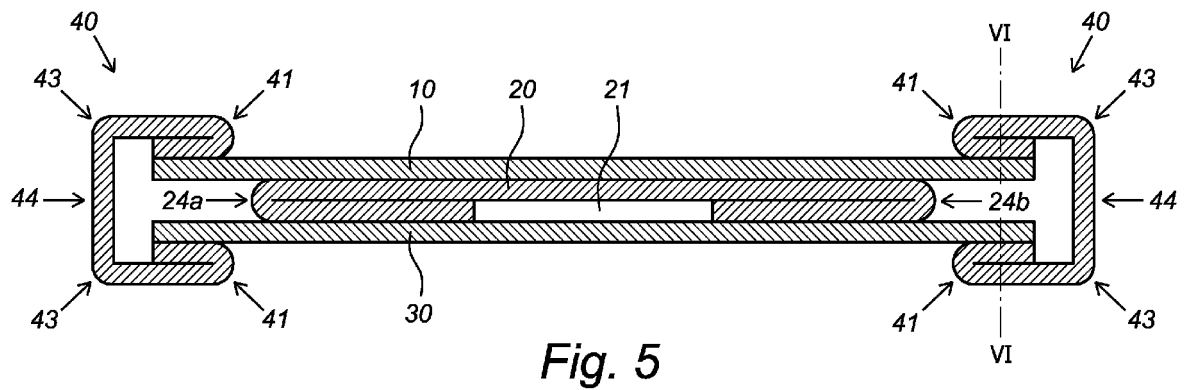
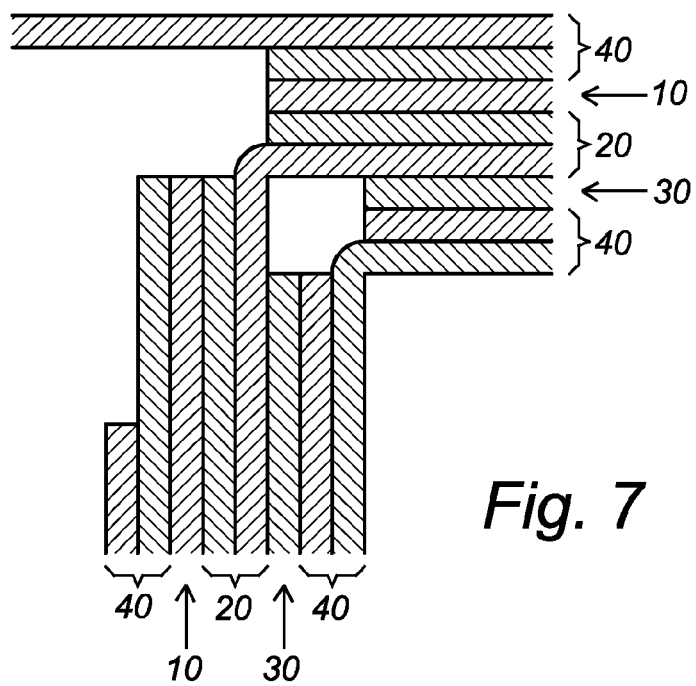
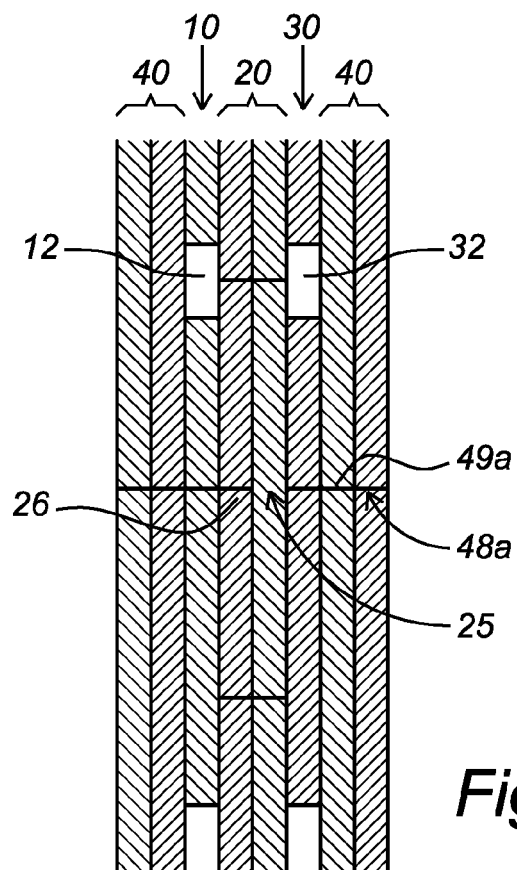


Fig. 5



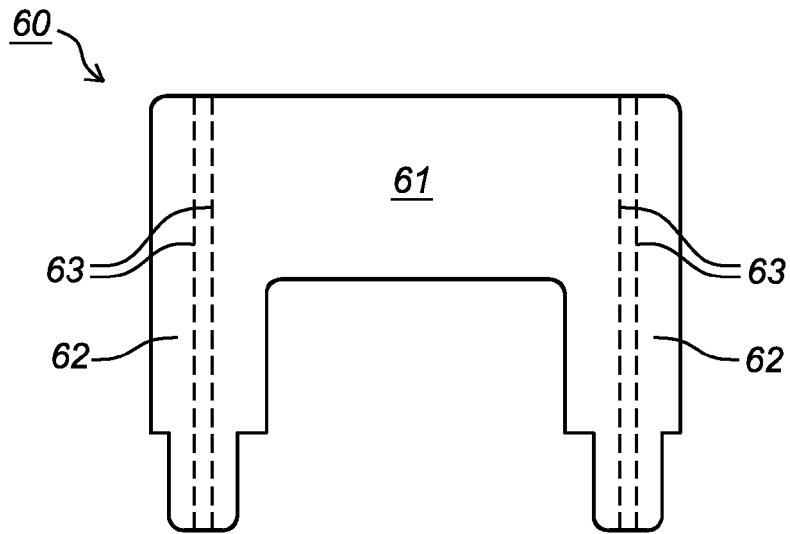


Fig. 8

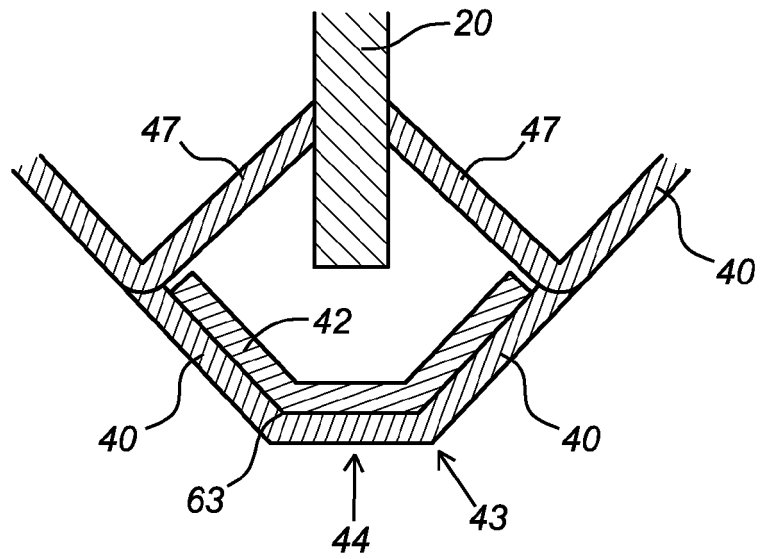


Fig. 9

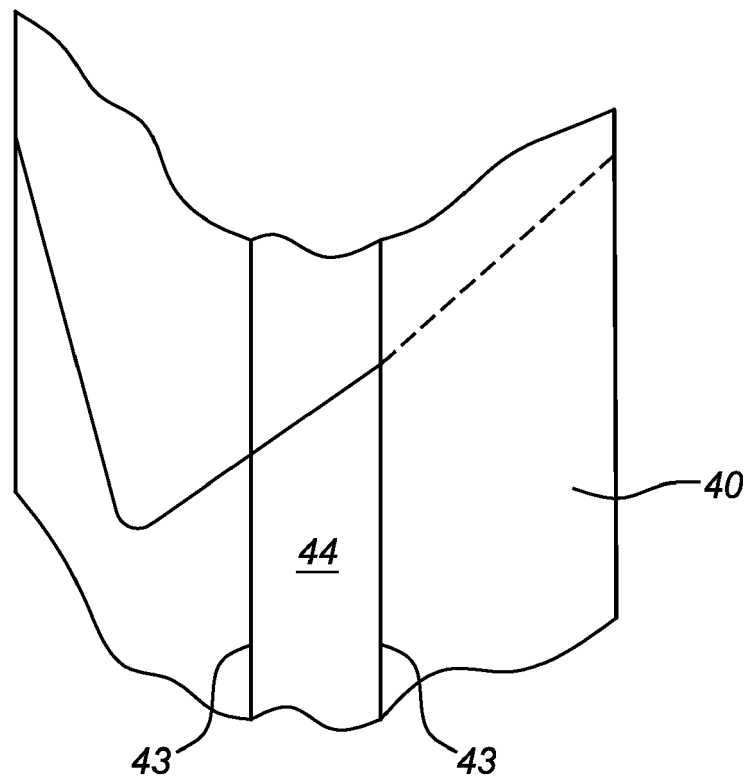


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 14 18 1399

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	CH 672 238 A5 (F A G ARTI GRAFICHE S R L) 15 November 1989 (1989-11-15) * abstract; figures 7-11 *	1	INV. A47F5/11
A	US 2010/006529 A1 (GROFF ALAN M) 14 January 2010 (2010-01-14) * abstract; figures 1-6 *	1	
A	GB 2 322 357 A (TRIO PACKING MATERIALS LIMITED) 26 August 1998 (1998-08-26) * abstract; figures 1-3 *	1	
A	US 901 858 A (WILLIAMS CHARLES F) 20 October 1908 (1908-10-20) * figure 5 *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A47F A47B
Place of search		Date of completion of the search	Examiner
The Hague		26 September 2014	Tempels, Marco
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 14 18 1399

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-09-2014

10

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CH 672238	A5	15-11-1989	NONE	

US 2010006529	A1	14-01-2010	NONE	

GB 2322357	A	26-08-1998	NONE	

US 901858	A	20-10-1908	NONE	

15

20

25

30

35

40

45

50

55

EPO FORM P0459

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