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(54) **Carton box, blank therefor and method for assembling the box**

(57) A blank for assembly into a container, the blank comprising a base panel (2), a first wall panel (10) and a second wall panel (18); the first wall panel having a corner flap (9) having a body portion (62) and end portion (64), the end portion having a smaller width than the body portion, the body portion being separated from the end portion by a shoulder (82,84); the second wall panel having a notch in a side edge adjacent the base panel (2), whereby the first wall panel may be folded substantially perpendicularly to the base panel and the corner flap

(9,19) may be folded over such that the shoulder (82,84) is retained in the notch to hold the corner flap in place. Preferably, the shoulder is adapted to exert a force on an edge of the notch distal from the base panel (2). A container formed from a blank is also disclosed. A process for assembling a container is disclosed comprising the steps of providing a blank; folding the corner flap over to retain the shoulder in the notch; and folding the second wall panel over the corner flap.

Description

[0001] The present invention relates to a container and in particular to a container which may be formed by the automated folding of a blank.

[0002] Cardboard and paperboard containers are typically made in an automated process in which substantially planar blanks are folded to give the finished container. The blanks are cut to have a specific outline and may also include scored lines defining fold lines and also slits, holes and perforations. The blank is then folded to give a three-dimensional carton or packaging, and may involve the use of interlocking members and/or adhesives to hold its shape. The blanks are designed in order to facilitate reliable and rapid assembly in an automated fashion.

[0003] However, there still exists a need to improve the design of such blanks and their automated assembly.

[0004] The present invention seeks to provide an improved container, a blank for such a container and a method for forming a container from a blank.

[0005] According to one aspect of the present invention there is provided a blank for assembly into a container, the blank comprising a base panel, a first wall panel and a second wall panel; the first wall panel having a corner flap having a body portion and end portion, the end portion having a smaller width than the body portion, the body portion being separated from the end portion by a shoulder; the second wall panel having a notch in a side edge adjacent the base panel, whereby the first wall panel may be folded substantially perpendicularly to the base panel and the corner flap may be folded over such that the shoulder is retained in the notch to hold the corner flap in place.

[0006] Preferably, the shoulder is adapted to exert a force on an edge of the notch distal from the base panel.

[0007] Conveniently, the corner flap has a second shoulder.

[0008] Advantageously, the blank further comprises a lid panel attached to the first wall panel and a third wall panel attached to the lid panel, the third wall panel having a notch in a side edge adjacent the lid panel, whereby the lid panel may be folded to be substantially parallel to the base panel and the corner flap may be folded over such that the first shoulder is retained in the notch of the second wall panel and the second shoulder may be retained in the notch of the third wall panel.

[0009] Preferably, the corner flap has a raised area, the second wall panel has an aperture and the third wall panel has a lowered area, such that when the corner flap is retained by the notches, the second wall panel may be folded over at least a portion of the first wall panel such that the raised area, the aperture and the second lowered area are substantially aligned.

[0010] Conveniently, the blank has an arcuate corner.

[0011] Advantageously, the blank has a right-angled corner.

[0012] Preferably, the blank has a corner of about

120°.

[0013] Conveniently, the blank has a corner of about 135°.

[0014] According to another aspect of the present invention, there is provided a container formed from a blank as defined above.

[0015] According to a further aspect of the present invention, there is provided a method for assembling a container comprising the steps of providing a blank as defined above; folding the corner flap over to retain the shoulder in the notch; and folding the second wall panel over the corner flap.

[0016] Preferably, the method comprises the steps of providing a blank as defined above, folding the corner flap over to retain the first shoulder in the notch of the second wall panel and to retain the second shoulder in the notch of the third wall panel, folding the second and third wall panels over at least a portion of the corner flap.

[0017] The present invention will now be described, by way of example, with reference to the accompanying Figures in which:

Figure 1 is a plan view of a blank in accordance with the present invention;

Figure 2 is a perspective view of a partially assembled carton in accordance with the present invention; Figure 3 is a partial perspective view of the carton shown in Figure 2;

Figure 4 is a partial perspective view of the carton in a further stage of assembly;

Figure 5 is a partial plan view of the carton shown in Figure 4;

Figure 6 is a partial perspective view of a carton in a further stage of assembly;

Figure 7 is a partial perspective view of a carton in a yet further stage of assembly;

Figure 8 is a cross sectional view along the line A-A of Figure 7; and

Figure 9 is a perspective view of the assembled carton.

[0018] Turning to Figure 1, a blank 1 is shown which is made of paperboard and which is ready for assembly into a three-dimensional carton. The blank 1 is substantially planar and has been die-cut to give a specific shape, and has also been provided with indentations, apertures and fold lines which will be discussed below. The blank 1 comprises a base panel 2 of substantially square shape with arcuate or rounded corners. A first front panel 4 is provided along one edge of base panel 2, separated therefrom by a fold line. First and second side panels 6 and 8 are provided on opposite sides of the base panel 2, separated therefrom by fold lines. On the remaining side of base panel 2, back panel 10 is provided, again separated from the back panel 2 by a fold line. On the opposite side of the back panel 10 a lid panel 12 is provided. The lid panel 12 is of substantially the same shape as the base panel 2. On the opposite side of the lid panel

12 from the back panel 10 is provided a second front panel 18, separated from the lid panel 12 by a fold line. On the remaining sides of the lid panel 12 are provided first and second side panels 14 and 16, separated therefrom by fold lines.

[0019] The first side panel 6 attached to the base panel 2 extends along the straight edge of the base panel 2 and is provided with two square apertures 22 and 24 positioned towards each end of the side panel 6. Retaining notches 46 and 48 are provided at each edge of the side panel 6 adjacent the base panel 2.

[0020] Similarly, the second side panel 8 attached to the base panel 2 has two square apertures 26 and 28 provided toward each end thereof. Also, retaining notches 50 and 52 are provided at each edge of the second side panel 8 adjacent the base panel 2. Those notches allow for a proper positioning during folding and gluing. They particularly assist avoiding any sliding of the different parts so that the parts are aligned and correspond to the ideal rounded shape.

[0021] The back panel 10 extends beyond its points of attachment to the base panel 2 at each edge, to a distance approximately the same as the distal edge of the first and second side panel 6 and 8 respectively. The back panel 10 thus has a first free end 9 and a second free end 11. The first free end 9 defines a first corner flap and the second free end 11 defines a second corner flap.

[0022] The first corner flap 9 has a body portion 62 of substantially the same width as the back panel 10. However, the corner flap 9 also has a terminal portion 64 having a reduced width as compared to the body portion 62. Also, towards the terminal edge of the corner flap 9 there is provided an indentation 30 of substantially square shape. The indentation 30 has been pressed down in relation to the remainder of the corner flap 9.

[0023] Similarly, the second corner flap 11 of the back panel 10 has a body portion 66 and a terminal portion 68 of reduced width as compared to the body portion 66. A lowered indentation of substantially square shape 32 is provided towards the terminal edge of the second corner flap 11.

[0024] The second front panel 18 is of similar configuration to the back panel 10. The front panel 18 extends beyond the edges of the lid panel 12, to a distance substantially equal to the distal edges of the first and second side panels 14 and 16 respectively. Thus, the front panel 18 has a first corner flap 17 at one end and a second corner flap 19 at the other end. The first corner flap 17 has a body portion 70 of greater width than a terminal portion 72. A lowered indentation 42 of substantially square shape is provided towards the terminal edge of the first corner flap 17.

[0025] The second corner flap 19 has a body portion 74 of greater width than a terminal portion 76. A lowered indentation 44 of substantially square shape is provided towards the terminal edge of second corner flap 19.

[0026] The first step in the assembly of a completed carton is the folding over of the blank such that the first

front panel 4 is positioned adjacent to the second front panel 18, such that the first front panel 4 is positioned within the interior of the carton thus formed. The first front panel 4 is attached to the second front panel 18 by the use of an adhesive.

[0027] The resulting situation is shown in Figure 2, with a partially completed carton 80 having a substantially tubular shape. The side panels 6, 8, 14 and 16 are not folded over and remain in substantially the same planes as the base panel 2 and lid panel 12. Similarly, the corner flaps 9 and 11 extend outwards in substantially the same plane as back panel 10 and corner flaps 17 and 19 extend outwards in substantially the same plane as front panel 18.

[0028] Figure 3 shows one corner of the partially assembled carton 80 of Figure 2 in greater detail. The side panel 8 extends in substantially the same plane as base panel 2 and side panel 16 extends in substantially the same plane as lid panel 12. The corner flap 19 extends upwards in the same plane as front panel 18.

[0029] As a result of the position and formation of the folding lines of the blank 1, the total width between the outer faces of base panel 2 and lid panel 12 is substantially equal to the width of the body portion 74 of the corner flap 19. However, the width of the terminal portion 76 of the corner flap 19 is less than the internal distance between the inner faces of the base panel 2 and lid panel 12. The body portion 74 of the corner panel 19 is separated and defined from the terminal portion 76 by shoulders 82 and 84 that extend inwardly from the outer edges of the corner flap 19.

[0030] In the automated assembly process, the corner flap 19 is folded around the arcuate corner of the carton 80 such that the shoulders 82 and 84 are pushed into the notches 50 and 60 respectively. This leads to the situation shown in Figure 4.

[0031] The corner flap 19 is bent over and follows the arcuate corner of the base panel 2 and lid panel 12. The shoulders 82 and 84 are received within notches 50 and 60 of the side panels 8 and 16 respectively. Due to the resilient nature of the paperboard substrate, the corner flap 19 seeks to straighten itself away from the arcuate corner of the carton 80. This forces the shoulders 82 and 84 upwards into contact with the upper edge of the notches 50 and 60 respectively. This abutment holds the corner flap 19 in position around the corner of the carton 80. In the automated process, the corner flap 19 is thus folded around the corner such that the shoulders 82 and 84 engage the notches 50 and 60. The corner flap 19 is thus reliably held in place ready for the next stage in the assembly process.

[0032] Figure 5 shows a plan view of the carton 80 shown in Figure 4. The engagement of the shoulders 82 and 84 within the notches 50 and 60 is clearly shown. As can be seen, the body portion 74 of the corner flap 19 is of substantially the same width as the distance from the outer surfaces of the base panel 2 and lid panel 14 respectively. However, the terminal portion 76 of the corner

flap 19 has a width less than the internal distance between the inner faces of the base panel 2 and the panel 14.

[0033] The next stage in assembly is the folding over of the side panel 8 along the fold line adjacent the base panel 2. The resulting situation is shown in Figure 6, with side panel 8 resting on top of the terminal portion of the corner flap 19. The raised indentation 44 of the corner flap 19 is in registration with the aperture 26 in the side panel 8. In other words, the indentation 44 projects upwards into the aperture 26.

[0034] The next stage in the assembly process is shown in Figure 7, with the side panel 16 being folded over on top of the side panel 8. The indentation 40 of the side panel 16 is in registration with the aperture 26 of side panel 8 and indentation 44 of corner flap 19. The indentation 40 projects downwards into the aperture 26. In the assembly process, a small amount of adhesive is placed between the indentations 40 and 44 such that the corner of the carton 80 is held together. In other words, the corner flap 19 and the side panel 16 are adhered to each other via the aperture 26 of the side panel 8. Thus, all three components of the corner of the carton 80 are adhered together.

[0035] Figure 8 shows a cross sectional view of the situation shown in Figure 7. The layering of the three components of the corner of the carton may be clearly seen. On the inner surface of the corner, the corner flap 19 extends between the base panel 2 and lid panel 12, with the raised area 44 extending upwardly. The next outer layer is side panel 8, with the aperture 26 being positioned above the raised area 44 of corner flap 19. The outermost layer is side panel 16, with the lowered area 40 extending downwardly towards the aperture 26 and projection 44.

[0036] In general, both corner flaps on one side of the carton 80 are assembled to give a carton having one open side. Articles or products are then inserted into the carton through the one open face, with that open face then being sealed in the manner described above. The resulting sealed carton 80 is shown in Figure 9. As shown, all corners of the carton have been folded over and secured in place. The corner flaps 11 and 19 have both been folded over and sealed in place beneath the side panels 8 and 16.

[0037] Although the invention has been described with respect to a substantially square carton with rounded corners, a person skilled in the art would appreciate that the invention is also applicable to a wide range of other cartons. For example, the invention may be used in non-rounded corners, for example with hexagonal or octagonal cartons.

[0038] Also, the invention may be used to form a tray-like carton that may then be covered by a lid. In the formation of such tray-like cartons, the corner flaps initially engage only one notch to be held in place in the formation of the tray-portion of the carton.

[0039] As mentioned above, the invention is particu-

larly suitable to form arcuate or rounded corners of containers. This produces cartons and the like which have an aesthetically pleasing appearance. Furthermore, the rounded corners avoid a major problem with traditional cuboid cartons. The right-angled corners of traditional cartons have a disadvantage in that they often crumple when subjected to force during manufacture, transport, display and use by the end consumer. In addition to reducing the aesthetic qualities of the finished carton, the crumpled corners can lead to contamination and/or spillage of the contents of the carton. Also, in situations where the contents of the carton are refrigerated or frozen, the rounded corners ensures that stacks of the carton naturally form air circulation channels where their corners meet which improves the efficiency of refrigeration.

Claims

1. A blank for assembly into a container, the blank comprising a base panel, a first wall panel and a second wall panel; the first wall panel having a corner flap having a body portion and end portion, the end portion having a smaller width than the body portion, the body portion being separated from the end portion by a shoulder; the second wall panel having a notch in a side edge adjacent the base panel, whereby the first wall panel may be folded substantially perpendicularly to the base panel and the corner flap may be folded over such that the shoulder is retained in the notch to hold the corner flap in place.
2. A blank according to Claim 1, wherein the shoulder is adapted to exert a force on an edge of the notch distal from the base panel.
3. A blank according to Claim 1 or 2, wherein the corner flap has a second shoulder.
4. A blank according to Claim 3, further comprising a lid panel attached to the first wall panel and a third wall panel attached to the lid panel, the third wall panel having a notch in a side edge adjacent the lid panel, whereby the lid panel may be folded to be substantially parallel to the base panel and the corner flap may be folded over such that the first shoulder is retained in the notch of the second wall panel and the second shoulder may be retained in the notch of the third wall panel.
5. A blank according to Claim 4, wherein the corner flap has a raised area, the second wall panel has an aperture and the third wall panel has a lowered area, such that when the corner flap is retained by the notches, the second wall panel may be folded over at least a portion of the corner flap and the third wall panel may be folded over at least a portion of the first wall panel such that the raised area, the aperture

and the second lowered area are substantially aligned.

6. A blank according to any preceding claim which has an arcuate corner. 5
7. A blank according to any preceding claim which has a right-angled corner.
8. A blank according to any preceding claim which has a corner of about 120°. 10
9. A blank according to any preceding claim which has a corner of about 135°. 15
10. A container formed from a blank as defined in any preceding claim.
11. A method for assembling a container comprising the steps of providing a blank as defined in any of Claims 1 to 9; folding the corner flap over to retain the shoulder in the notch, folding the second wall panel over the corner flap. 20
12. A method according to Claim 11 comprising the steps of providing a blank as defined in Claim 5, folding the corner flap over to retain the first shoulder in the notch of the second wall panel and to retain the second shoulder in the notch of the third wall panel, folding the second and third wall panels over at least a portion of the corner flap. 25 30
13. A blank substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 35
14. A container substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 40
15. A method of manufacturing a container substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 45

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Fig.1.

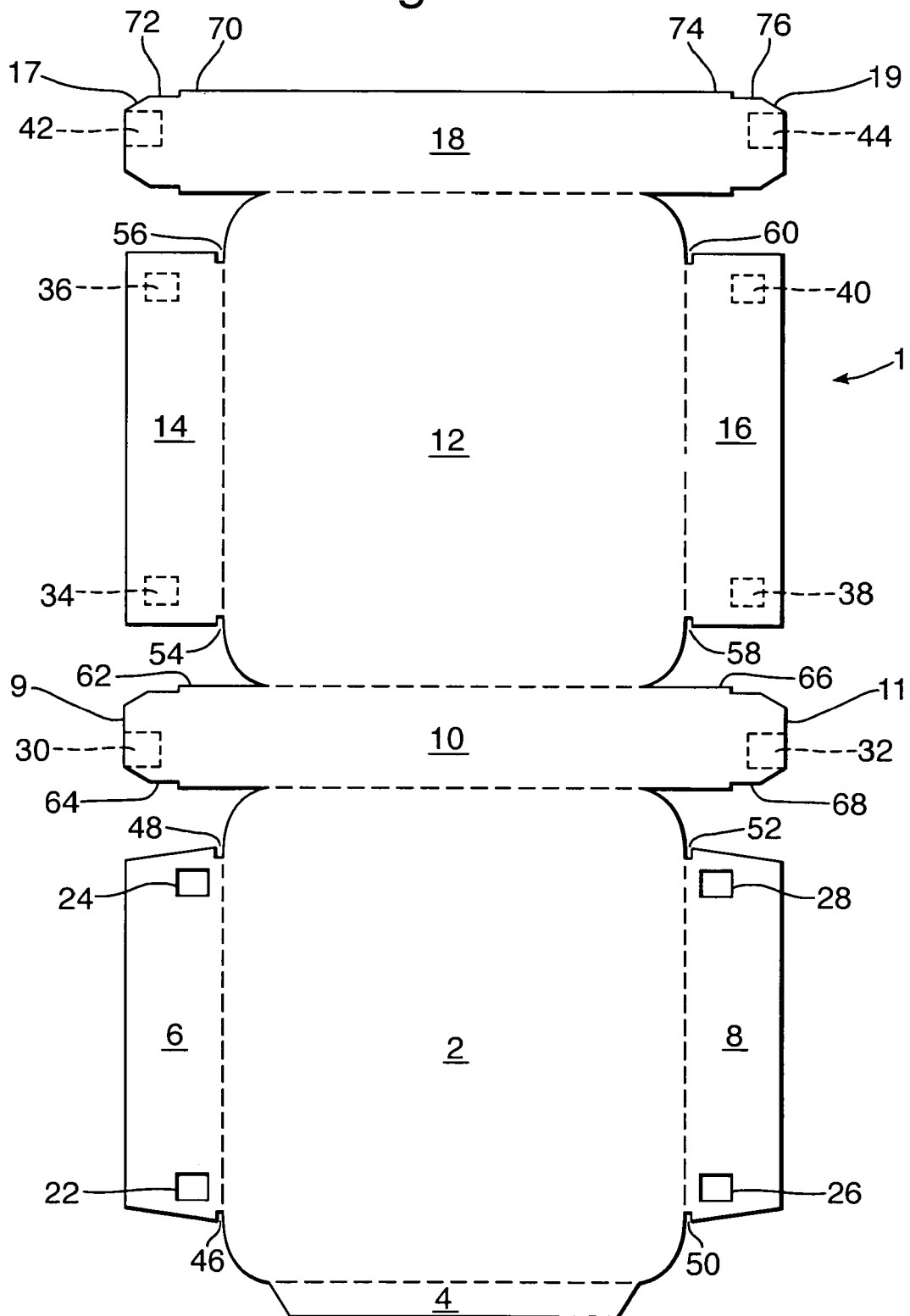


Fig.2.

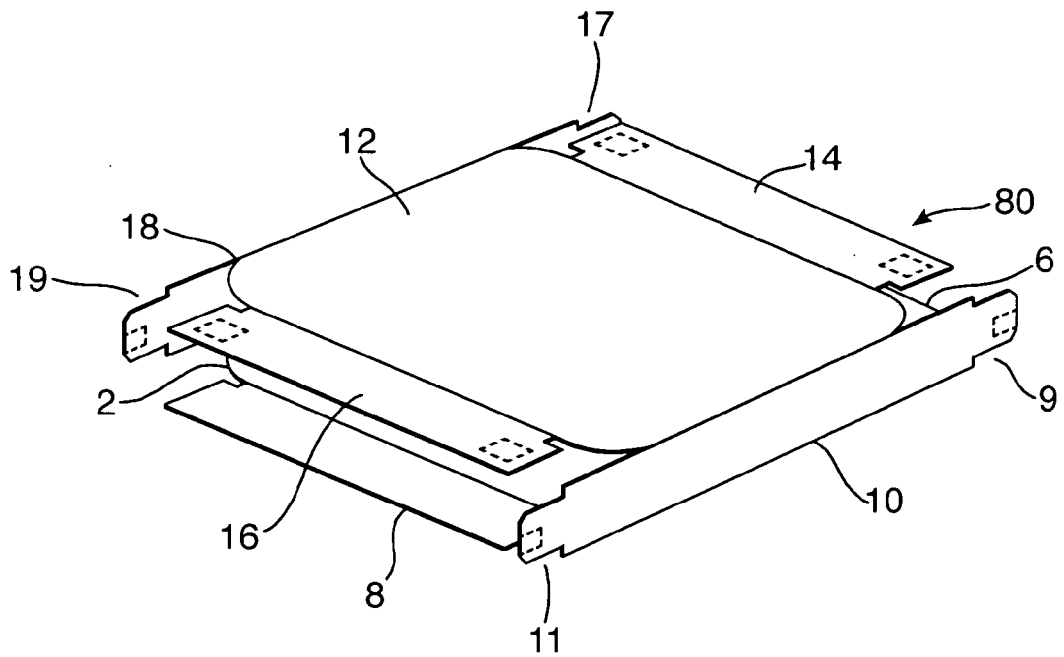


Fig.3.

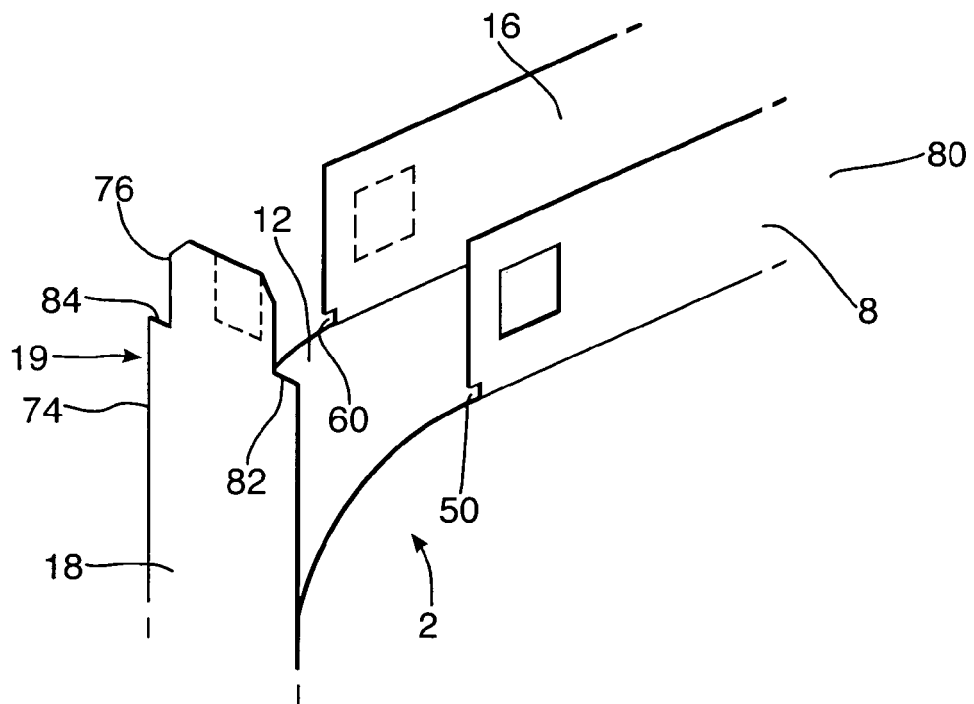


Fig.4.

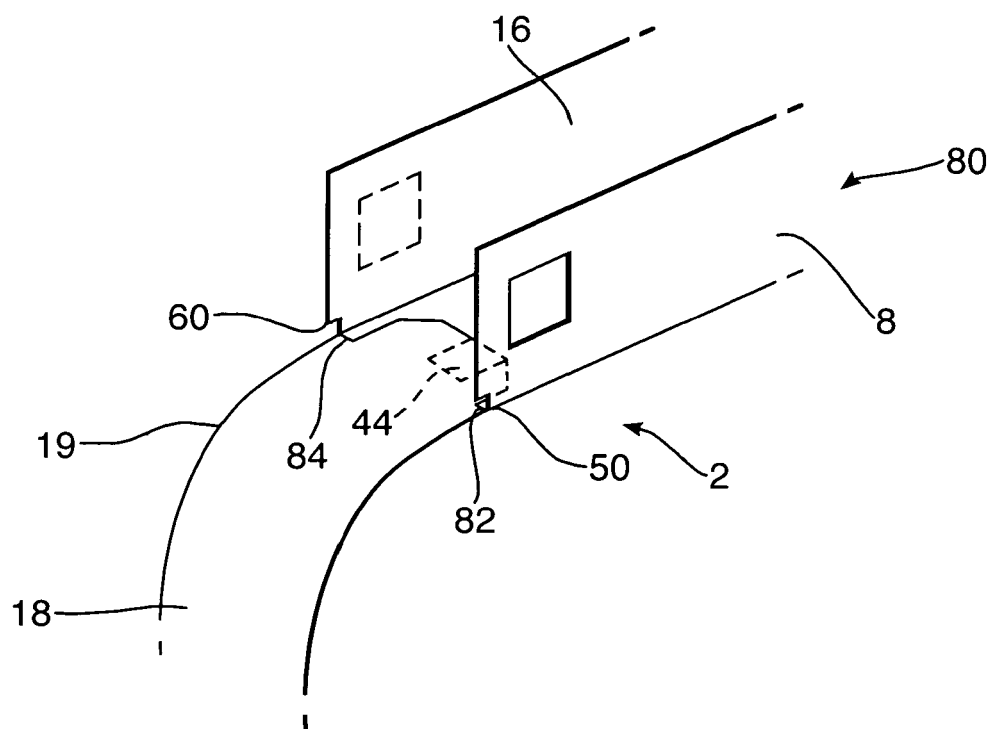


Fig.5.

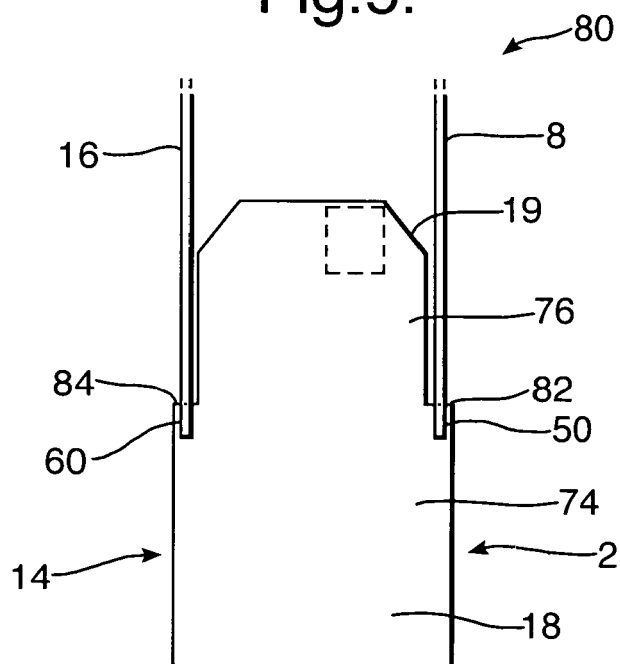


Fig.6.

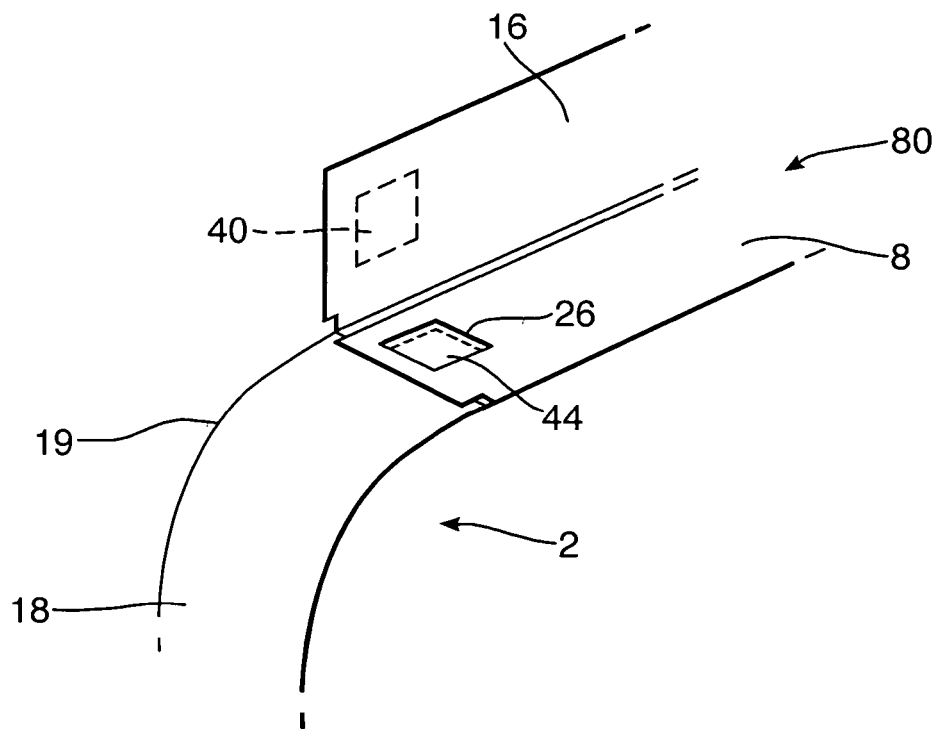


Fig.7.

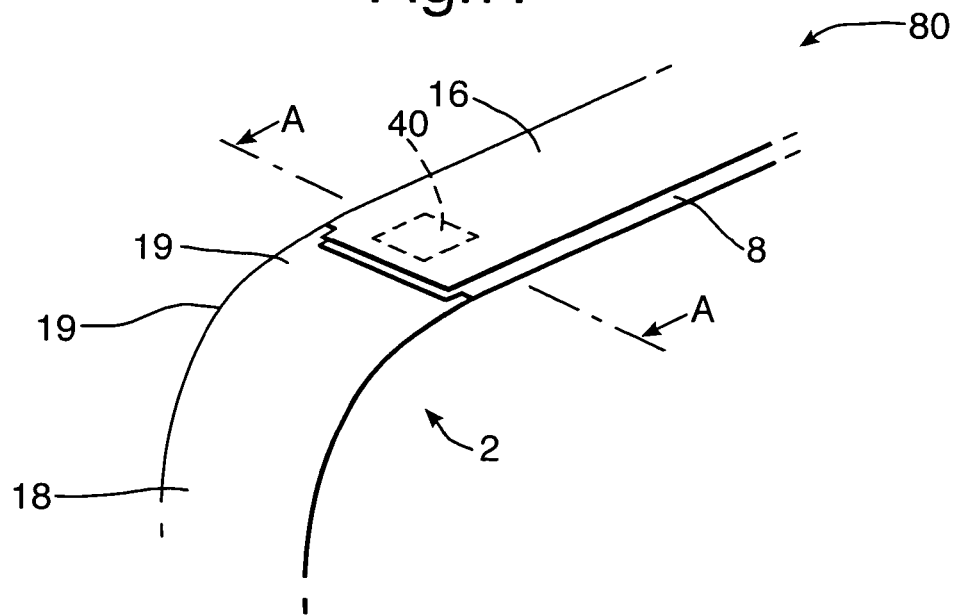


Fig.8.

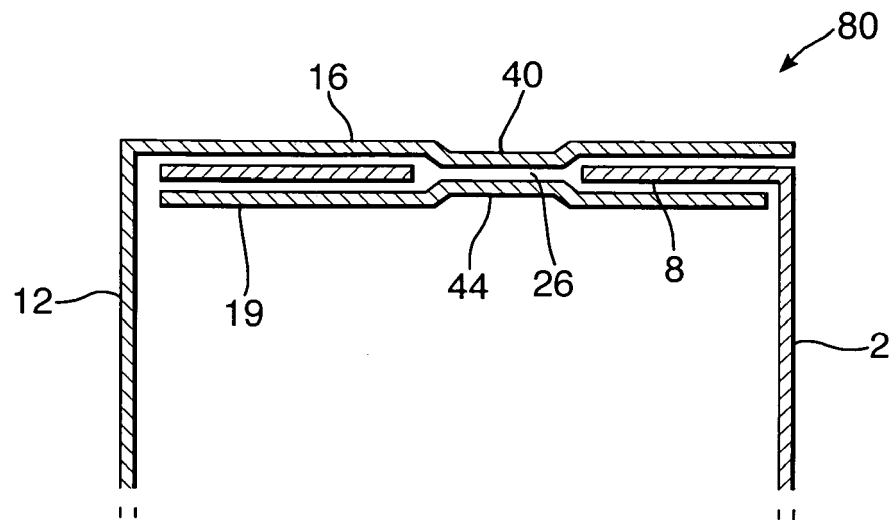
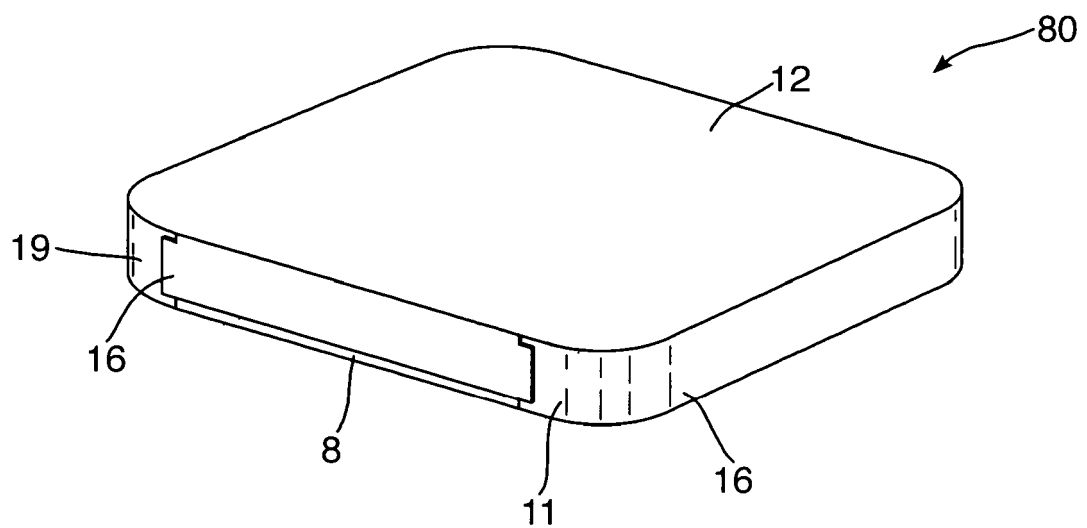


Fig.9.





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PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention EP 05 25 7111
shall be considered, for the purposes of subsequent
proceedings, as the European search report

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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INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search		Date of completion of the search	Examiner
The Hague		13 March 2006	Pernice, C
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			

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EPO FORM 1503 03.82 (P04C07)



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**INCOMPLETE SEARCH
SHEET C**

Application Number
EP 05 25 7111

Claim(s) searched completely:
1-12

Claim(s) not searched:
13-15

Reason for the limitation of the search:

Rule 29(6) of the EPC.

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

EP 05 25 7111

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
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13-03-2006

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