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U. BAUER, "Verpackung", 1981, Vogel Verlag Würzburg

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Courier Press, Leamington Spa, England.

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Description

This invention concerns a packaging element, for erection into a container, comprising at least one layer of stiff material lined on at least one side with a thin flexible material, said stiff material comprising a base element having end flaps on opposed ends thereof, side elements franking the base element, said side elements having gussets on opposed ends thereof which gussets extend outwardly to substantially the same extent as the end flaps of the central base element, and a lid element flanking one of the side elements.

Conventional packaging elements (containers) are generally not fluid impervious, and where there is a requirement in industry for a container which is fluid impervious this has generally been met by the use of plastic liners. In the food industry where containers are used for packing frozen foods, it is particularly important that there should be no contamination of the foodstuffs as a result of unprotected contact between the contents and the material from which the containers are made. In recent years attempts have been made to produce a packaging element for erection into a container in which a plastics or other protective lining its formed integrally with the container body. U.S. Patents Nos. 4056221 and 2430610 are typical examples. U.S. Patent No. 4056221 discloses a packaging element formable into a container which has an integrally-formed plastics liner having also an external plastics layer. The liner and external plastics layer totally enclose the stiffening cardboard material and a fluid-tight but open container is formable from the packaging element. The container of U.S. Patent No. 2430610 is of the kind defined and the first paragraph of this specification and comprises gussets that are triangular and positioned so that there exist first substantially triangular areas of thin flexible material devoid of stiff material between the adjacent end flaps and the gussets, said lid element having triangular gussets on opposed ends thereof which gussets extend outwardly to substantially the same extent as the end flaps of the central base so that there exists a respective second substantially triangular area of thin flexible material devoid of stiff material adjacent each of the gussets of the lid element, parallel folding seams being provided between each of the adjacent base, side and lid elements and between the end flaps and the gussets, the arrangement and construction being such that upon folding the end flaps and gussets upright relative to the base, side and lid elements about said folding seams and folding the side elements relative to the base element so that they are upright relative to the base element, the respective first triangular area is accommodated between the corresponding gussets fixed to the respective side element and the corresponding end flap. The pre-characterising portion of claim 1 is based on this prior art. This container does have an integrally formed closure, but it is provided by a single lid element flanking one only of the side elements. Thus, it is not fluid-tight, nor is it of a self-supporting configuration in its erected, but open, pre-loading condition.

It is an object of the present invention to provide a packaging element whereby these drawbacks are obviated, the construction being such that the container, in its initially-erected and pre-closure condition is self-supporting, and such that erection and closure of the container (which when closed is liquid-tight) is achieved in two simple steps.

Starting from the packaging element disclosed in U.S. Patent No. 4056221 as above discussed, the present invention achieves this object by provision of such an arrangement characterised in that there is a respective said lid element flanking each of the side elements and in that there is a border of thin flexible material all around the layer of thin material so that when said side elements are upright, portions of the adjacent second triangular areas overlap and can be joined to retain the erected packaging element in a condition for filling with the side elements, lid elements and gussets all upright with respect to the base element so that a container is formed having a single opening thereto, and by extending said opening transversely, the free edges of the lid elements and adjacent gussets are drawn together for sealing.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:

Figure 1: is a diagrammatic perspective view of a packaging element in manufacture and in accordance with one aspect of the present invention, and

Figure 2: is a diagrammatic side view of an apparatus for manufacturing a packaging element in accordance with the present invention, and

Figure 3: is a plan view of a packaging element in accordance with a further possible embodiment of the present invention, and

Figures 4, 5, 6 and 7: are diagrammatic perspective views indicating the manner in which the packaging element of Figure 3 can be erected into a container, and

Figure 8 is a plan view of a packaging element in accordance with a further possible embodiment of the present invention, and

Figures 9, 10 and 11: are diagrammatic perspective views showing the manner in which the packaging element of Figure 9 may be erected into a container.

With respect to Figure 1 of the drawings a packaging element generally indicated by arrow 1 and according to the example illustrated comprises a first layer 2 of plastics material, a second layer stiff material such as cardboard 3, and a third layer of plastics material 4. The plastics layers 2 and 4 are adhered to the stiff material 3 and to each other where there is not contact with the cardboard 3. The first and third layers 2 and 4, in plastics, can be co-extruded film comprising a sandwich of EVA film and LDPE film. The EVA has a low melting point and is in contact with and

adheres to the cardboard 3 and the other plastics layer.

The second layer 3 of stiff material comprises a centre section 5 and two side sections 6, and the side sections 6 are spaced from and positioned at equal distances from the ends of the centre section 5.

After manufacture the packaging element can be formed into a container with a base 5, sides 6, and ends formed from extending parts 5A of the section 5 (a bend in the cardboard being made along the broken lines 7), corners being gussetted and sealed or otherwise joined.

As an alternative to the use of co-extruded film, the plastics layer 2 and 4 can be single sheets of plastics, adhered to the stiff material by a suitable adhesive. The stiff material forming the centre and side sections may optionally be a unitary member (not shown) with sides 6 foldable about seams.

Figure 2 of the drawings illustrates an apparatus for making the packaging elements of Figure 1. The apparatus illustrated comprises a conveyor 8 positioned upstream from a pair of rollers 9 and 10, fed with plastics film 11 from a supply source indicated by arrow 12. The centre spacings of the rollers 9 and 10 can be adjustable to suit the thickness of the packaging element. Stiffening material 13 is placed on the conveyor 8, which stops, receives the stiffening material 13 and then feeds the same between the rollers 9 and 10. The rollers 9 and 10 can be heated by a fluid such as oil such that the plastics adheres to the stiffening material and the adhesive process is further assisted as it passes through pinch rollers 14 (which can be covered with a soft material such as rubber or felt material) downstream of the rollers 9 and 10 which applies pressure to the top and bottom surfaces of the packaging element as it passes betweem them. A rotating hot or cold knife 15 can be positioned downstream of the rollers 14, such being designed to perforate or cut (see broken line of Figure 1) the plastics material to make one element easily separable from the element following. Box-making collection and forming plant at 16 complete the process for forming the packaging elements into a container.

Where a co-extruded film as aforesaid is used the inner layer (which may be EVA plastics) is softened during the manufacturing process and becomes, in effect, an adhesive. The conveyor 8 and the pinch rollers 14 are optional.

Figures 3 to 7 of the drawings illustrate one possible embodiment of a packaging element in accordance with the present invention, the element generally indicated by arrow 17 being formable into a container (generally indicated by arrow 18 and illustrated by Figure 7), said container having a base 19 and sides 20 and a lid section generally indicated by arrow 21. The packaging element comprises a first layer of plastics 22, a second layer of stiff material 23 and a third layer of plastics material 24, said first and third layers 22, 24 being adhered to the stiff material 23 and to one another where they overlap. A border 25, where there is surface contact between the plastics layers is provided about the periphery of the element 17. The stiff material 23 comprises a substantially rectangular base 26 with flaps 27 foldable with respect to the base 26 and flaps 28 foldable with respect to the the flaps 27 such folding being made about seams 29. Each of the flaps 27 and 28 are provided with gussets 30 and 31 and the base 26 is provided with end sections 32, the gussets 30 and 31 and end sections 32 foldable with respect to the flaps 27 and 28 and the base 26 respectively. The gussets 30 are of a triangular shape defined by seams 33, a long side 34, and short side 35. The gussets 31 are similarly shaped.

At one end of the packaging element 17 an additional strip 36 of stiff material is provided such being foldable about seams 37. In addition to the border 25 plastics to plastics contact between the first and third layers is provided at triangular areas 38 void of the stiff material.

The packaging element 17 of Figure 3 can be erected into the container 18 of Figure 7 in progressive steps as is illustrated by Figures 4, 5 and 6. The first step (see Figure 4) is to fold the end sections 32 and the gussets 30 and 31 into an upright position with respect to the base 26 and flaps 27 and 28. The next step in the erection of container 18 is illustrated by Figure 5 which shows the opposed flaps 27 and 28 being folded about seam 29 which is common with the base 26 such that gussets 30 overlap the outside end sections 32 of the element, and void areas 38A are accommodated between the gussets 30 and the end sections 32.

This later step is further progressed until the flaps 27 are perpendicular with the base 26 (see Figure 6) and at that point edges 39 of the border 25 overlap and can be adhered together by blocking, heat sealing or the like. When the sides of the element are upright (or as part of a process for achieving this step) an inverted "T" shaped seal T is made binding together all adjacent overlying plastics layers. A container ready to receive articles is thus formed, and overlapping and adjacent edges 39 have been utilised to secure the container in its erected position. The container 19 can be filled and the ends of the top edges extended in the direction of the arrows 40.

Figure 7 illustrates the manner in which the lid 21 (formed from flaps 28 and gussets 31) can be sealed by the matching of the strip 36 to border portion 25a as the flaps 28 and gussets 31 lay flat (a natural consequence of movement of the lid section in direction of arrow 40), and finally the sealed container can be closed by folding down the flap formed by the joined border portion 25a and the strips 36, folding the triangular lid ends 41 formed from gussets 31 downwards in the direction of arrow 42, and fixing the lid ends to the base and/or the ends of the container. To make it easier to form the step of Figure 6, that is, the sealing and/or blocking when the container is ready to receive goods (see Figure 6) the gusset tips 43 may be trimmed off at line 31a when the

stiff element is fabricated, and prior to the application of the plastics layers 22 and 24.

The packaging element 17 could have its base 26, and flaps 27 and 28 formed from separate pieces of material in a similar manner to the element of Figure 1. By so doing material savings can be made when the stiff material is pre-cut.

Figures 8 through to 11 of the drawings illustrate a further embodiment of a packaging element in accordance with the present invention, which is somewhat similar to that illustrated by Figures 3 through to 7 of the drawings. For that reason equivalent components are denoted by the same numerals used with respect to the Figures 3 to 7 embodiment. The main difference from the previously described embodiment is that the gussets 31 of the Figures 3 to 7 embodiment do not exist and in fact triangular gussets 44 are provided which are fixed about seam 29 of gussets 30 as shown. The strip 36 from the previous embodiment is omitted.

The steps in the erection of the element of Figure 8 into a container are identical to those described in relation to Figures 4 and 5 of the Figures 3 to 7 embodiment. However at the equivalent stage of Figure 6 the overlapping edges 39 are sealed or blocked on both outer and inner edges of the container. To close off the lid the gussets 44 are drawn to the flat position as the ends of the lid section are pulled in the direction of arrow 40 and opposed border sections 25B are matched and sealed in the equivalent to the Figure 7 stage previously referred to. The end parts formed from gussets 44 can then be folded down and fixed as previously described.

Whilst it has been known in the art to package food in cardboard containers lined with plastics (to prevent the cardboard from contaminating the food) and to make the containers lined with plastics these are not completely hygienic. Such containers lined with plastics have edges at which the cardboard is exposed. In contrast, the present invention provides a container which has no exposed areas of cardboard. Additionally, and in accordance with aspects of the present invention a coardboard container can be formed with no flaps or joining strips in the cardboard material.

Containers in accordance with aspects of the present invention are substantially tamper-proof particularly if a tape such as EVA tape which is sealable against the outer edges of the container and/or lid is used. A glue tape may also be used.

Because plastics is a fluid impervious material containers of the present invention are liquid impervious and can be made gas impervious by using a gas impervious material and one of the layers of a co-extrusion laminate. Examples of suitable gas impervious materials are nylon, aluminium or PVDC.

Whilst the containers described can be conveniently made using co-extruded plastics it would be appreciated from the foregoing that a more suitable general description would be that the container walls are multi-laminates and optionally co-extrusions can be used.

It is to be appreciated from the a foregoing that a container can be formed having a hygienic non-fibrous surface of for example plastics material in a simple yet effective manner which will allow for example meat to be packed in an atmosphere free of cardboard fibres as the containers can be formed a substantial distance or indeed in a different factory to the place where they are filled. At the filling station all cardboard is contained within the first and third layers and therefor the risk of cardboard fibres being present in the atmosphere or otherwise coming into contact with meat products is substantially reduced.

Further advantages of the containers of the present invention are that the blanks can be pre-printed and a lighter-weight, less rigid cardboard can be used and even re-cycled cardboard could be used.

At least for some embodiments of the present invention fold lines are eliminated and these are thought to be the cause of problems at removal and thawing when containers are used to store food under refrigeration.

Whilst containers/cartons of the present invention are ideally suited for storage and cartage of foods (frozen, chilled or otherwise) it is to be appreciated that the containers may be used for any purpose whatsoever.

Examples of the present invention have been described herein where the stiff material is provided with separate pieces or as a unitary member. Although this system has advantages it should be appreciated that the stiff material can be optionally provided in separate pieces, or as a unitary member with the various portions of stiff material foldable about a seam formed therein.

It is to be appreciated that the flexible layers of material although most likely to be from plastics may be from other materials, such as sheet foil or the like.

Aspects of the present invention have been described by way of example only and it will be appreciated that modifications and additions thereto may be made without departing from the scope of the present invention as defined in the appended claims.

Claims

1. A packaging element, for erection into a container, comprising at least one layer of stiff material (3, 23) lined on at least one side with a thin flexible material (2, 22) said stiff material comprising a central base element (26) having end flaps (32) on opposed ends thereof, side elements (27) flanking the base element (26), said side elements (27) having gussets (30) on opposed ends thereof which gussets (30) extend outwardly to substantially the same extent as the end flaps (32) of the central base element (26), and a lid element (26) flanking one of the side elements (27) the gussets (30) being triangular and positioned so that there exist first substantially triangular areas (38) of thin flexible material devoid of stiff material between the

adjacent end flaps (32) and the gussets (30), said lid element (28) having gussets (31) on opposed ends thereof which gussets (31) extend outwardly to substantially the same extent as the end flaps (32) of the central base (26) so that there exists a respective second substantially triangular area (38) of thin flexible material devoid of stiff material adjacent each of the gussets (31) of the lid element (28) parallel folding seams (29) being provided between each of the adjacent base, side and lid elements (26, 27, 28) and between the end flaps (32) and the gussets (31, 31), and in which the arrangement and construction is such that upon folding the end flaps (32) and gussets (30, 31) upright relative to the base, side and lid elements (26, 27, 28) about said folding seams (29) and folding the side elements (27) relative to the base element (26), so that they are upright relative to the base element (26), the respective first triangular area (38) is accommodated between the corresponding gussets (30) fixed to the respective side element (27) and the corresponding end flap (28) characterised in that there is a respective said lid element (28) flanking each of the side elements (27) and in that there is a border (25) of thin flexible material all around the layer of thin material (2, 22) so that when said side elements (27) are upright portions of the respective adjacent second triangular areas (38) overlap and can be joined to retain the erected packaging element in a condition for filling with the side elements (27), lid elements (28), and gussets (30, 31) all upright with respect to the base element (26) so that a container is formed having a single opening thereto, and by extending said opening transversely, the free edges of the lid elements (28) and adjacent gussets (31) are drawn together for sealing.

2. A packaging element according to claim 1 further characterised in that a further strip (36) of stiff material is applied to the outer edge of one of the lid elements (28) with a folding seam (37) provided between the strip (36) of stiff material and the lid element (28), said strip (36) acting to stiffen one opposed portion of the opening of the container.

3. A packaging element according to claim 1 or 2 further characterised in that it includes a second layer (4, 24) of thin flexible material applied over the stiff material (3, 23) which is sandwiched between the two layers (2, 4/22, 24) of thin flexible material, said layers of thin flexible material being adhered to the stiff material and to one another whereby they overlap such that there is surface to surface contact therebetween at least about the periphery of the stiff material and the stiff material is hermetically and hygienically sealed within the flexible material.

4. A packaging element according to claim 1, 2 or 3 characterised in that the thin flexible material is a plastics material.

Patentansprüche

1. Verpackungselement, das zu einem Behälter formbar ist, mit mindestens einer Lage aus steifem Material (3, 23), die auf mindestens einer Seite mit einem dünnen flexiblen Material (2, 22) versehen ist, wobei das steife Material ein zentrales Basiselement (26) mit Abschlußklappen (32) an entgegengesetzten Enden und das Basiselement (26) flankierende Seitenelemente (27) mit Zwickeln (30) an entgegengesetzten Enden und ein an eines der Seitenelementes (27) angrenzendes Deckelelement (28) aufweist, die Zwickel (30) sich gleichweit wie die Abschlußklappen (32) nach außen erstrecken, dreieckig und so angeordnet sind, daß sich erste Dreiecksbereiche (38) dünnem flexiblem, vom steifen Material freien Material zwischen den benachbarten Abschlußklappen (32) und den Zwickeln (30) ergeben; das Deckelelement (28) mit Zwickeln (21) an entgegengesetzten Enden, die sich genausoweit wie die Abschlußklappen (32) des Basiselementes (26) nach außen erstrecken, versehen ist, so daß sich neben jedem Zwickel (31) ein zweiter Dreiecksbereich (38) aus dünnem flexiblen Material ergibt, der frei von steifen Material ist; mit parallelen Faltlinien (29) zwischen jedem benachbarten Element (26, 27, 28), den Abschlußklappen (32) und den Zwickeln (30, 31), wobei die Anordnung und Konstruktion so getroffen sind, daß beim Auffalten der Abschlußklappen (32) und Zwickel (30, 31) relativ zum Basiselement (26), zu den Seitenelementen (27) und dem Deckelelement (28) um die Faltlinien (29) nach oben und beim Auffalten der Seitenelemente (27) gegenüber dem Basiselement (26) dergestalt, daß sie vom Basiselement (26) nach oben abstehen, ein erster Dreieckbereich (38) jeweils zwischen an einem Seitenelement (27) befestigten Zwickeln (30) und einer Abschlußklappe (32) untergebracht ist, dadurch gekennzeichnet, daß jedes der Seitenelemente (27) von einem Deckelelement (25) flankiert ist und sich ein Rand (25) aus dünnem flexiblem Material um den ganzen Belag aus dünnem Material (2, 22) erstreckt, so daß, wenn die Seitenelemente (27) aufrechtstehende Abschnitte sind, die benachbarten zweiten Dreiecksbereiche (38) überlappen und verbunden werden können, um das aufgefaltete Verpackungselement in einer Füllstellung zu halten, in welcher die Seitenelemente (27), die Deckelelemente (28) und die Zwickel (30, 31) alle vom Basiselement (26) nach oben abstehen und ein Behälter mit einer einzigen Öffnung gebildet ist, und daß beim Auseinanderziehen dieser Öffnung in Querrichtung die freien Ränder der Deckelelemente (28) und benachbarte Zwickel (31) zum Versiegeln zusammengezogen werden.

2. Verpackungselement nach Anspruch 1, dadurch gekennzeichnet, daß ein zusätzlicher Streifen (36) aus steifem Material am äußeren Rand von einem der Deckelemente (28) angebracht ist und eine Faltlinie (37) zwischen dem Streifen (36) aus steifem Material und dem Deckelelement (28) gebildet ist und der Streifen (36) zur Versteifung eines entgegengesetzten Teiles der Öffnung des Behälters dient.

3. Verpackungselement nach Anspruch 1 bis 2,

dadurch gekennzeichnet, daß er einen zweiten Belag (4, 24) aus dünnem flexiblem Material aufweist, das auf das steife Material (3, 23) aufgelegt ist, das sich damit zwischen den beiden Belägen (2, 4/22, 24) aus dünnem flexiblem Material befindet, und daß die Beläge aus dünnem flexiblem Material mit dem steifen Material und an Überlappungsstellen miteinander verbunden sind, so daß ein Fläche-zu-Fläche-Kontakt zwischen ihnen mindestens um den Rand des steifen Materials herum besteht und das steife Material hermetisch und hygienisch zwischen das flexible Material eingeschlossen ist.

4. Verpackungselement nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß das dünne flexible Material ein Kunststoffmaterial ist.

Revendications

1. Elément de conditionnement, destiné à être érigé sous forme de boîte, comprenant au moins une couche de matériau rigide (3, 23) en alignement avec un matériau fin flexible (2, 22) sur au moins une de ses faces, ledit matériau rigide comprenant un élément central de fond présentant des languettes d'extrémités (32) sur des faces opposées: des éléments latéraux (27) logeant l'élément de fond (26), lesdits éléments latéraux (27) présentant des goussets (30) à leurs extrémités opposées, lesdits goussets (30) s'étendant vers l'extérieur jusqu' approximativement, le même niveau que les languettes d'extrémités (32) de l'élément central de fond (26); et un couvercle (28) logeant un des éléments latéraux (27), les goussets (30) étant de forme triangulaire et positionnés de façon à definir des premières zones (38) essentiellement triangulaires de matériau fin flexibles dépourvues de matériau rigide, entre les languettes d'extrémités voisines (32) et les goussets (30); ledit couvercle (28) présentant des goussets (31) sur ses faces opposées, lesdits goussets (31) s'étendant vers l'extérieur jusqu' approximativement le même niveau que les languettes d'extrémités (32) du fond central (26) de façon à définir une seconde zone (38) essentiellement triangulaire de matériau fin flexible dépourvue de matériau rigide à proximité de chacun des goussets (31) du couvercle (28), des jointures parallèles de pliage (29) étant prévues entre chacun des éléments de fond, éléments latéraux et couvercle (26, 27, 28) et entre les languettes d'extrémités (32) et les goussets (30, 31); et dans lequel la disposition et la construction sont telles que lors du repli des languettes d'extrémités (32) et des goussets (30, 31) à angle droit par rapport aux éléments latéraux de fond et de couvercle (26, 27, 28) autour desdites jointures de pliage (29), et du repli des éléments latéraux (27) par rapport à l'élément de fond (26), la première zone triangulaire (38) vient se placer entre les goussets correspondants (30) fixés à l'élément latéral correspondant (27) et la languette d'extrémité correspondante (28), caractérisé en ce qu'on prévoit un couvercle (28) longeant chacun des éléments latéraux (27), et en ce qu'on prévoit une bordure (25) de matériau fin flexible tout autour de la couche de matériau fin (2, 22) de façon que lorsque lesdits éléments latéraux (27) sont redresses, des portions desdites secondes zones triangulaires voisines (38) se recouvrent et peuvent être reliées pour maintenir l'élément de conditionnement érigé dans ses conditions de remplissage, les éléments latéraux (27), de couvercle (28), et les goussets (30, 31) étant tous à angle droit par rapport à l'élément de fond (26), de façon à former une boîte à ouverture unique, les bords libres des couvercles (28) et des goussets adjacents (31) étant joints pour scellage par extension transversale de ladite ouverture.

2. Elément de conditionnement selon la revendication 1, caractérisé complémentairement en ce qu'une bande additionnelle (36) de matériau rigide est appliquée sur le bord extérieur de l'un des couvercles (28), avec une jointure de pliage (37) prévue entre la bande (36) de matériau rigide et le couvercle (28), ladite bande (36) servant à rigidifier la portion opposée de l'ouverture de la boîte.

3. Elément de conditionnement selon la revendication 1 ou 2, caractérisé complémentairement en ce qu'il comprend une seconde couche (4, 24) de matériau fin flexible appliquée sur le matériau rigide (3, 23), et interposée entre les deux couches (2, 4/22, 24) de matériau fin flexible, lesdites couches de matériau fin flexible étant collées au matériau rigide, et l'une à l'autre, à l'endroit où elles se recouvrent, de façon qu'il y ait un contact de surface à surface entre eux au moins à la périphérie du matériau rigide, et que le matériau rigide soit scellé hermétiquement, de façon hygiénique, à l'intérieur du matériau flexible.

4. Elément de conditionnement selon la revendication 1, 2 ou 3, caractérisé en ce que le matériau fin flexibles est une matière plastique.

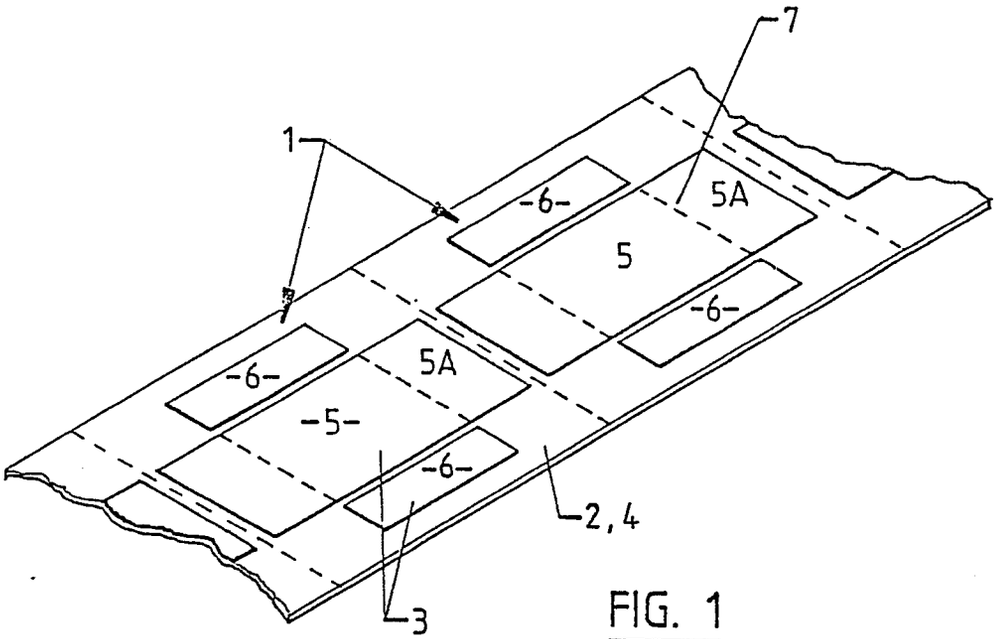


FIG. 1

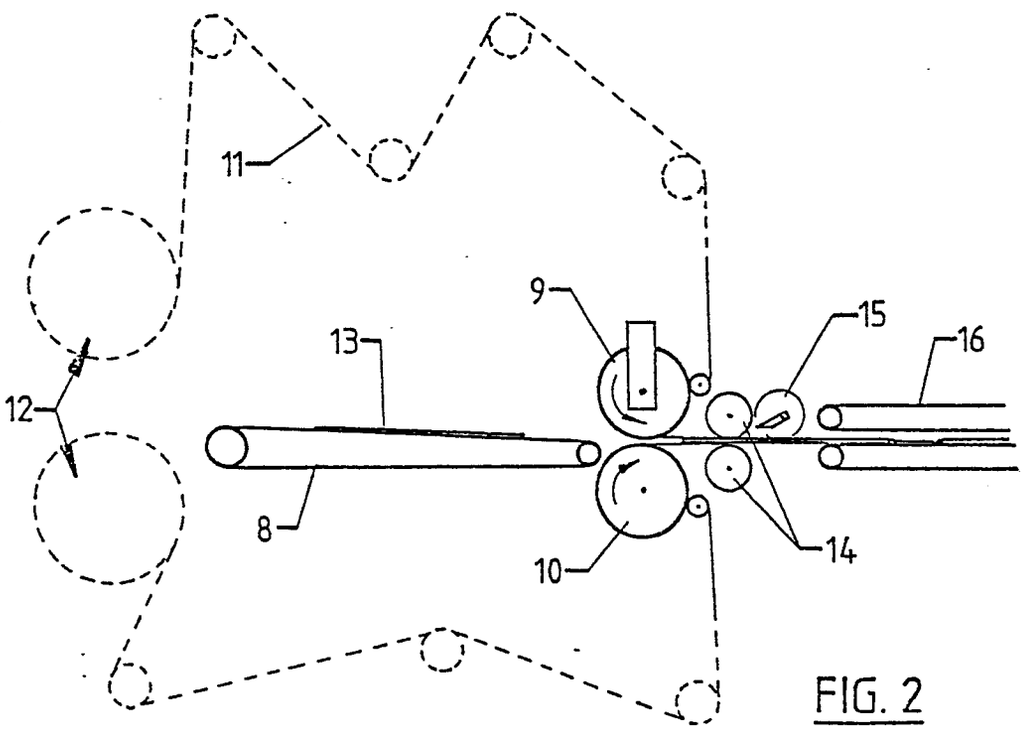


FIG. 2

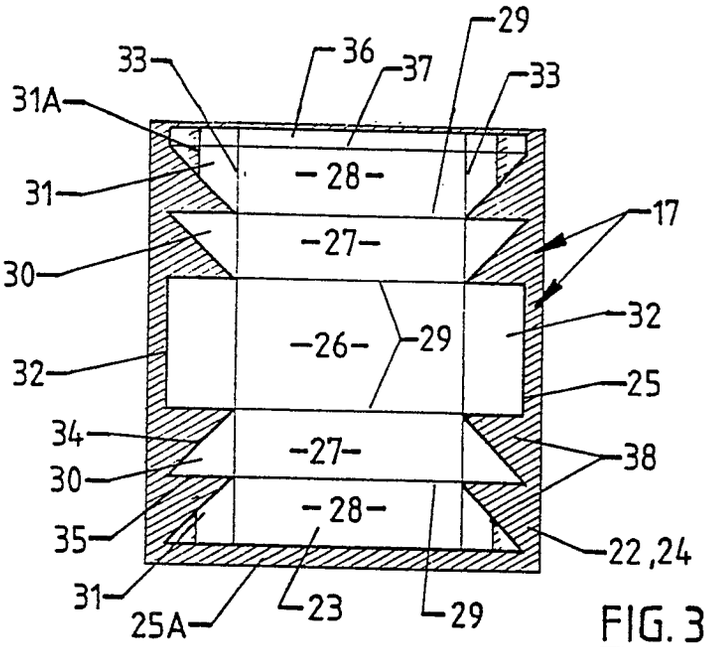


FIG. 3

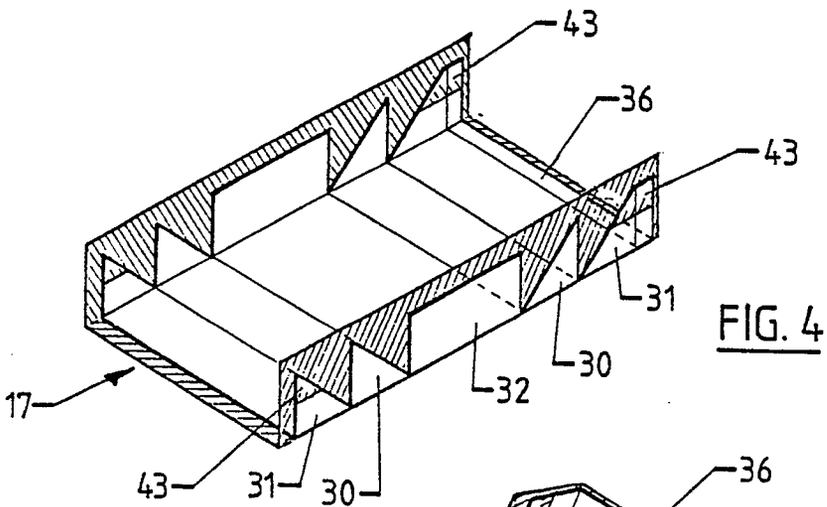


FIG. 4

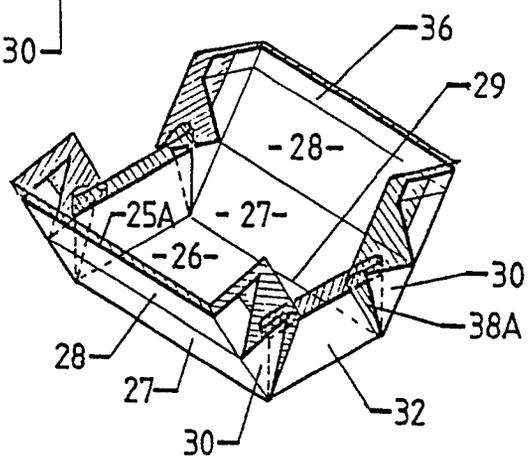


FIG. 5

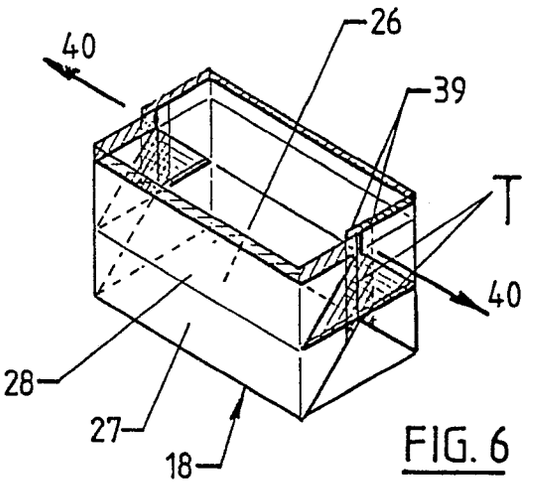


FIG. 6

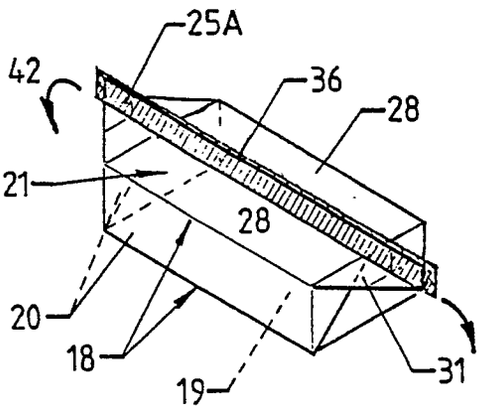


FIG. 7

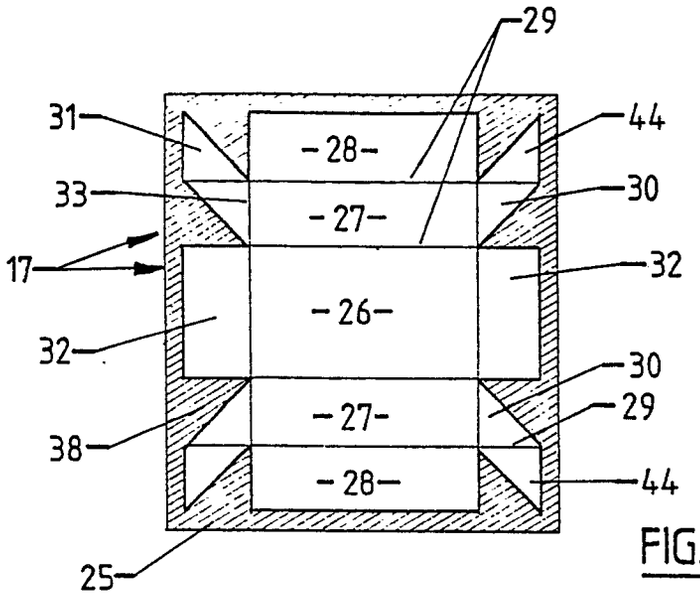
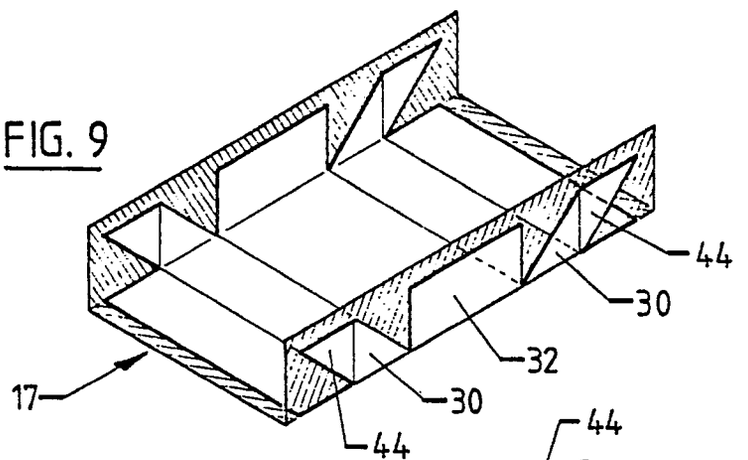


FIG. 8

FIG. 9



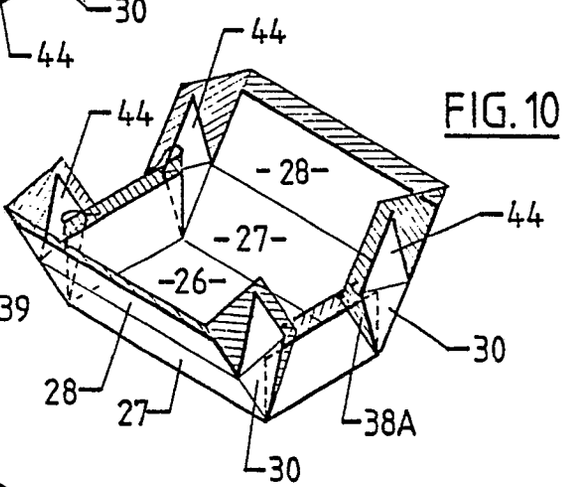


FIG. 10

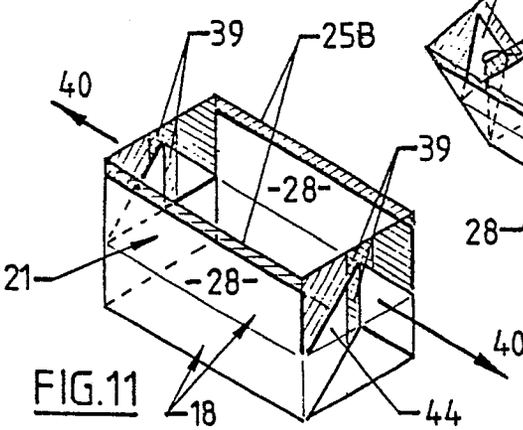


FIG.11