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# (54) Carton and carton blank

(57) A carton and blank for forming a carton comprising a plurality of panels for forming a sleeve with an access closure structure (50) hingedly connected to the sleeve for opening and closing an access opening, wherein the sleeve has a first locking element (46) disposed inside the sleeve. The closure structure has a second locking element (69) for engagement with the first element to lock the closure structure in the closed position; the first locking element (46) comprises an engaging flap (46) hingedly connected to the edge of the access opening and folded inwardly to lie within the sleeve and the second locking element (69) comprises an engaging tab (69) formed from the closure structure to engage the inner free edge of the engaging flap (46).

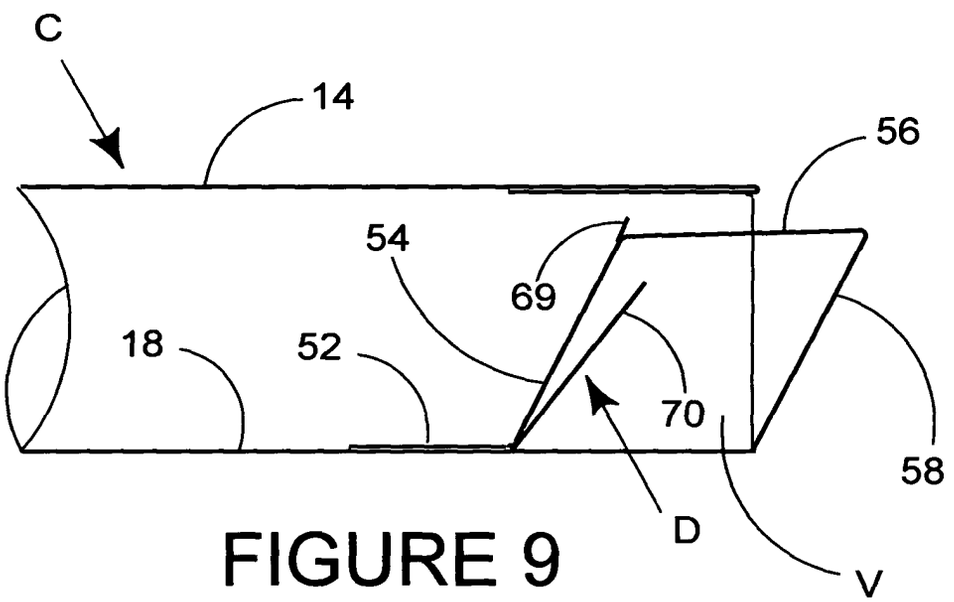


FIGURE 9

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## Description

**[0001]** The invention relates to a carton or sleeve for accommodating one or more articles for example pharmaceutical preparations, foodstuff or the like formed from one or more blanks of paperboard or other suitable foldable sheet material and more particularly to a sleeve capable of being formed into a sealed compartment comprising an inner tray and outer sleeve.

**[0002]** It is desirable for cartons containing articles such as foodstuff or pharmaceutical preparations to be enclosed to protect the or each article. Furthermore, the carton should preferably be reclosable to allow it to be reused.

**[0003]** One example of reclosable sleeves formed from one or more blanks of cardboard is found in US 3,078,030 which illustrates a carton having an integral hinged top which is reclosable. The top is provided by a front cover panel and a spacer panel secured to one side of the front cover panel to interfit with a mating upper portion of the front panel of a box. Fastening means is formed from a detached double layer portion of the front panel. However, the detached portion is attached to the inside surface of the cover flap resulting in a stepped non-flat front surface.

**[0004]** In cartons where articles are positioned next to one another in abutment, it can be difficult to gain access to the interior of the carton. One known solution is to open the carton from the side or end but this is undesirable because it tends to destroy the integrity of the carton. Another solution is to use a tear panel with a pull tab which is undesirable because it can be inadvertently pulled or removed completely. Examples of this general carton type are illustrated in US 2 122 480 and US 3 735 914.

**[0005]** The present invention and its preferred embodiments seek to overcome or at least mitigate the problems of the prior art.

**[0006]** One aspect of the invention provides a carton comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing an access opening, wherein the sleeve has a first locking element disposed inside the sleeve. The closure structure has a second locking element for engagement with the first element to lock the closure structure in the closed position, the first locking element comprises an engaging flap hingedly connected to the edge of the access opening and folded inwardly to lie within the sleeve and the second locking element comprises an engaging tab formed from the closure structure to engage the inner free edge of the engaging flap. Preferably, the engaging flap is secured to the inside surface of the body.

**[0007]** A second aspect of the invention provides a carton comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing the access opening, wherein the sleeve has a first locking element disposed inside the sleeve and wherein the closure structure has a second locking element for engagement with the first element to lock the closure structure in the closed position, the closure structure further comprising a collapsible tubular structure that is transformable to take an erected tubular form when in the closed position and a collapsed form when in the opened position, the tubular structure is formed from a plurality of panels hingedly connected one to the next in series, and the second locking element comprises a tab formed from one of the said panels forming the tubular structure.

**[0008]** In some embodiments, the tab forming the second locking element is disposed out of the plane of the one panel and extends to the first locking element when the closure structure is in the closed position.

**[0009]** The sleeve may have an aperture for receiving a user's finger to facilitate disengagement of the locking elements from each other, and the aperture is positioned to allow access to the inside surface of the tubular structure by a user's finger through the aperture thereto. Optionally, the aperture is defined in the portion of the sleeve defining at least in part the closure structure. Preferably, the aperture is defined by a tear element formed from the body and detachably connected at least in part to the body along a frangible line.

**[0010]** A third aspect of the invention provides a blank comprising a top wall panel, a first side wall panel, a base wall panel and a second side wall panel hingedly connected together in series for forming a sleeve and an access closure structure hingedly connected to the sleeve for opening and closing the access opening in a set up carton, wherein the sleeve has a first locking element provided by a first flap hingedly connected to one of the panels forming the sleeve and wherein the closure structure has a second locking element for engagement with the first element in a set up carton and the second locking element comprises an engaging tab formed from one of the panels forming the closure structure.

**[0011]** A fourth aspect of the invention provides a blank comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing the access opening in a set up carton, wherein the sleeve has a first locking element hinged to one of the panels forming the sleeve and the closure structure has a second locking element for engagement with the first element in a set up carton, wherein the closure structure comprises a plurality of panels hingedly connected one to the next in series for forming a collapsible tubular structure, and the second locking element comprises a tab formed from one of the said panels.

**[0012]** Exemplary embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

FIGURE 1 is a plan view of a blank for forming a carton according to a preferred embodiment of the invention;

FIGURES 2 and 3 illustrate views of the blank of Figure 1, shown during the folding process;

FIGURES 4 and 5 are perspective views of the carton formed from the blank of Figure 1 in a set up and loaded condition;

FIGURES 6 and 7 are perspective views of the carton of Figure 1 showing the end wall structure being opened to allow access to the contents of the carton; and

FIGURES 8, 9 and 10 are cross-sectional views shown through X-X shown in Figure 4 illustrating the opening of the access structure.

**[0013]** Referring to the drawings, and in particular Figure 1, there is shown a blank 10 for forming a carton (or sleeve) made up from one or more blanks of paperboard or similar foldable sheet material, for example plastic or the like. The blank 10 comprises a plurality of panels forming a sleeve. In this embodiment, there comprises an inner first side wall panel 12, a top wall panel 14, a second side wall panel 16, a base wall panel 18 and an outer first side wall panel 20 hingedly connected one to the next along fold lines 22, 24, 26 and 28 respectively. In this embodiment the sleeve has rectangular top and base panels although it is envisaged that other shapes of base or top wall panels can be employed according to the shape and/or size of the articles to be contained.

**[0014]** The end wall structures are provided along opposing ends of the sleeve whereby, in the embodiment illustrated in Figure 1, there comprises a first end wall panel 30 hingedly connected to side wall panel 14 along fold line 32 and a second end wall panel 34 hingedly connected to side wall panel along fold line 36.

**[0015]** In one class of embodiments there further comprises end support flaps which are used to support the end wall panels 30, 34; so in this embodiment, there comprises end flaps 38 and 42 hingedly connected to the side wall panels 16 and 20 along fold lines 40 and 44 respectively.

**[0016]** An access structure A (Figure 8) is provided to the interior of the carton. In this embodiment, the access structure is provided with a first locking element disposed inside the sleeve and a closure structure 50 including a second locking element for engagement with the first element to lock the closure structure 50 in the closed position. In the embodiment of Figure 1, the first locking element is provided by the inner free edge E of an engaging flap 46 which is hingedly connected to the top wall panel 14 along fold line 48.

**[0017]** The closure structure 50 is provided by a plurality of panels incorporating a second locking element 69 struck from one of the panels. Preferably, the plurality of panels are adapted to form a collapsible structure that is transformable to take an erected tubular form when in the closed position and a flat collapsed form when in the open position.

**[0018]** Thus, the tubular structure is formed by a plurality of panels hingedly connected one to the next in series: in this embodiment there comprises a first closure panel 52, a second closure panel 54, a third closure panel 56 and a fourth closure panel 58 hingedly connected one to the next along fold lines 60, 62 and 64. In Figure 1, the access structure 50 is hingedly connected to base wall panel 18 along fold line 66. The second locking element comprises a tab 69 formed from one of the four panels and is defined at least in part by cut line 68.

**[0019]** Preferably, there further comprises a flap 70 struck from base wall panel 18 by cut line 72 and hingedly connected thereto along fold line 74. In use, the flap 70 is pushed inwardly to define an aperture for receiving a user's finger to facilitate disengagement of the locking elements from each other, described in more detail below.

**[0020]** In order to form the completed carrier in flat collapsed condition from the blank, a series of sequential folding and gluing operations are required and will be described further with reference to Figures 2 and 3 of the drawings. The folding and gluing operations can be performed in one or more straight line machines, so that the tray is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

**[0021]** The first stage in the construction of the carton from the blank 10 shown in Figure 1, is to form the access structure. The first locking element is constructed by folding panel 46 about fold line 48 and into face contacting arrangement with top wall panel 14. Preferably, panel 46 is secured by glue or other suitable means known in the art. The closure structure 50 is also constructed by folding the closure panels 52, 54 and 56 along fold line 64 so as to bring the aforementioned panels into face contacting arrangement with closure panel 58 and base wall panel 18. Preferably, the closure panel 52 is secured to base wall panel 18 so that the carton is at the stage of construction illustrated in Figure 3 in a flat collapsed form.

**[0022]** In order to complete construction of the carton shown in Figures 4 and 5, the sleeve is constructed, whereby side wall panel 12, top wall panel 14, second side wall panel 16 and outer first side wall panel 20 are folded out of alignment along fold lines 22, 24, 26 and 28 respectively and into a sleeve arrangement. Inner and outer first side wall panels 12 and 20 are secured together by glue or other suitable means known in the art. The end wall is constructed by folding end flaps 38 and 42 inwardly along fold lines 40 and 44 and inner and outer end wall panels 30 and 34 inwardly along fold lines 32 and 36 to be secured together by glue or other suitable means known in the art.

**[0023]** Finally the articles are inserted and the closure structure 50 is erected to form a tubular structure. This

is achieved by folding closure panels 54, 56 and 58 out of alignment along fold lines 66, 64, 62 and 60 so as to produce a tubular structure, shown in Figure 8. The first and second locking elements are engaged to lock the closure structure in a closed position and the carton is then ready to be supplied to an end user, as shown in Figures 4, 5 and 8.

**[0024]** In order to gain access to the interior of the carton, a user presses a tab 70 in an inward direction D, shown in Figures 6 and 9, which tab 70 is separated from base wall panel 18 along frangible fold line 72. The user's finger U is inserted into the void V created by the tubular closure structure and is then used to push against the closure panel 58 to cause the first and second locking elements for example edge E and tab 69 to become disengaged from each other.

**[0025]** It will be seen from Figure 7 that the aperture's position is such that it is in communication with the internal area of the tubular structure so that the inside surface, or void, of the tubular structure is accessible by the user's finger through the aperture. Finally, the tubular structure is moved to a collapsed position shown in Figure 10 to reveal an opening for removing the articles.

**[0026]** If the end user wishes to reclose the carton, the outlined steps may be reversed and the closure structure 50 is closed by pushing up the closure panel 58 which causes the access opening to close by reconstructing the collapsible tubular structure. The user continues to push on the panel 58 until the first and second locking elements are interengaged which is determined by when the tubular structure is in the position illustrated in Figure 8.

**[0027]** In some embodiments, a noise is emitted, for example a clicking sound, caused by the tab 69 which is deformed as it comes into contact with panel 46, is then released once it gets beyond the free end edge E and comes into contact with another of the adjacent panels to emit a noise thereby indicating the first and second locking elements are engaged. Beneficially, this offers an aural indication that the pack is locked and is particularly suitable where, for example, from the articles are pharmaceutical preparations.

**[0028]** It will be recognised that as used herein, the terms "top", "bottom", "side", "end", "inner", "outer", "upper" and "lower" with respect to the panels of the carton (or carton blank) are relative terms, and that the carton (formed from the blank) may be re-oriented as necessary or as desired. It will be further recognised that rather than the bottom wall being formed from the interlocked panels, the carton blank may be rearranged whereby some other wall such as a top wall or a side wall is formed from the interlocked panels. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only: indeed it is envisaged that hinged connection can be formed from one or more of one of the following, a score line, a frangible line or a fold line, without departing from the scope of invention.

**[0029]** The invention and its preferred embodiments relate to a carton or a sleeve which is shaped to provide satisfactory rigidity to hold items with a degree of flexibility. The shape of the blank minimises the amount of paperboard required for the carton. The carton can be constructed from a flat collapsed condition to position of use and/or loaded by hand or automatic machinery. It is anticipated the invention can be modified without departing from the scope of the invention: for example, side and end panels can be increased in height or width to provide a carton to receive one or more articles of different shapes and/or sizes. Furthermore, the tearing structure, end wall structure, and re-closable closure structure shown in the drawings can be applied to other known carton types, for example fully enclosed cartons for beverage containers or for foodstuffs, without departing from the scope of invention.

**[0030]** Beneficially the embodiment of the invention hereinbefore described provides a structure that is sufficiently strong to retain articles and to provide an integral sleeve. In particular, the end walls of the tray provide additional strength to the carton as they act as support members between top and base panels of the outer shell or cover portion. The use of paperboard material provides an "environmentally" friendly alternative and the sleeves made from paperboard can include printed matter for marketing purposes.

## Claims

1. A carton comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing an access opening, wherein the sleeve has a first locking element disposed inside the sleeve and wherein the closure structure has a second locking element for engagement with the first element to lock the closure structure in the closed position, the first locking element comprises an engaging flap hingedly connected to the edge of the access opening and folded inwardly to lie within the sleeve and the second locking element comprises an engaging tab formed from the closure structure to engage the inner free edge of the engaging flap.

2. The carton as claimed in claim 1 wherein the engaging flap is secured to the inside surface of the body.

3. A carton comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing the access opening, wherein the sleeve has a first locking element disposed inside the sleeve and wherein the closure structure has a second locking element for engagement with the first element to lock the closure structure in the closed position, the closure

structure further comprising a collapsible tubular structure that is transformable to take an erected tubular form when in the closed position and a collapsed form when in the opened position, the tubular structure is formed from a plurality of panels hingedly connected one to the next in series, and the second locking element comprises a tab formed from one of the said panels forming the tubular structure.

**4.** The carton according to claim 3 wherein the tab forming the second locking element is disposed out of the plane of the one panel and extends to the first locking element when the closure structure is in the closed position.

**5.** The carton according to claim 3 or claim 4 wherein the sleeve has an aperture for receiving a user's finger to facilitate disengagement of the locking elements from each other, and the aperture is positioned to allow access to the inside surface of the tubular structure by a user's finger through the aperture thereto.

**6.** The carton according to claim 5 wherein the aperture is defined in the portion of the sleeve defining at least in part the closure structure.

**7.** The carton according to claim 5 or claim 6 wherein the aperture is defined by a tear element formed from the body and detachably connected at least in part to the body along a frangible line.

**8.** A blank comprising a top wall panel, a first side wall panel, a base wall panel and a second side wall panel hingedly connected together in series for forming a sleeve and an access closure structure hingedly connected to the sleeve for opening and closing the access opening in a set up carton, wherein the sleeve has a first locking element provided by a first flap hingedly connected to one of the panels forming the sleeve and wherein the closure structure has a second locking element for engagement with the first element in a set up carton and the second locking element comprises an engaging tab formed from one of the panels forming the closure structure.

**9.** A blank comprising a plurality of panels for forming a sleeve with an access closure structure hingedly connected to the sleeve for opening and closing the access opening in a set up carton, wherein the sleeve has a first locking element hinged to one of the panels forming the sleeve and the closure structure has a second locking element for engagement with the first element in a set up carton, wherein the closure structure comprises a plurality of panels hingedly connected one to the next in series for forming a collapsible tubular structure, and the second locking element comprises a tab formed from one of the said panels.

**10.** A blank according to claim 9 wherein the sleeve has an aperture positioned to allow access to the inside surface of the tubular structure by a user's finger through the aperture thereto.

**11.** A blank according to claim 10 wherein the aperture is defined in one of the panels forming the sleeve.

**12.** A blank according to claim 11 wherein the aperture is defined by a tear element formed from one of the panels forming the sleeve and detachably connected at least in part to the sleeve along a frangible line.

**13.** A package comprising a plurality of articles held within a carton as claimed in any of claims 1 to 7.

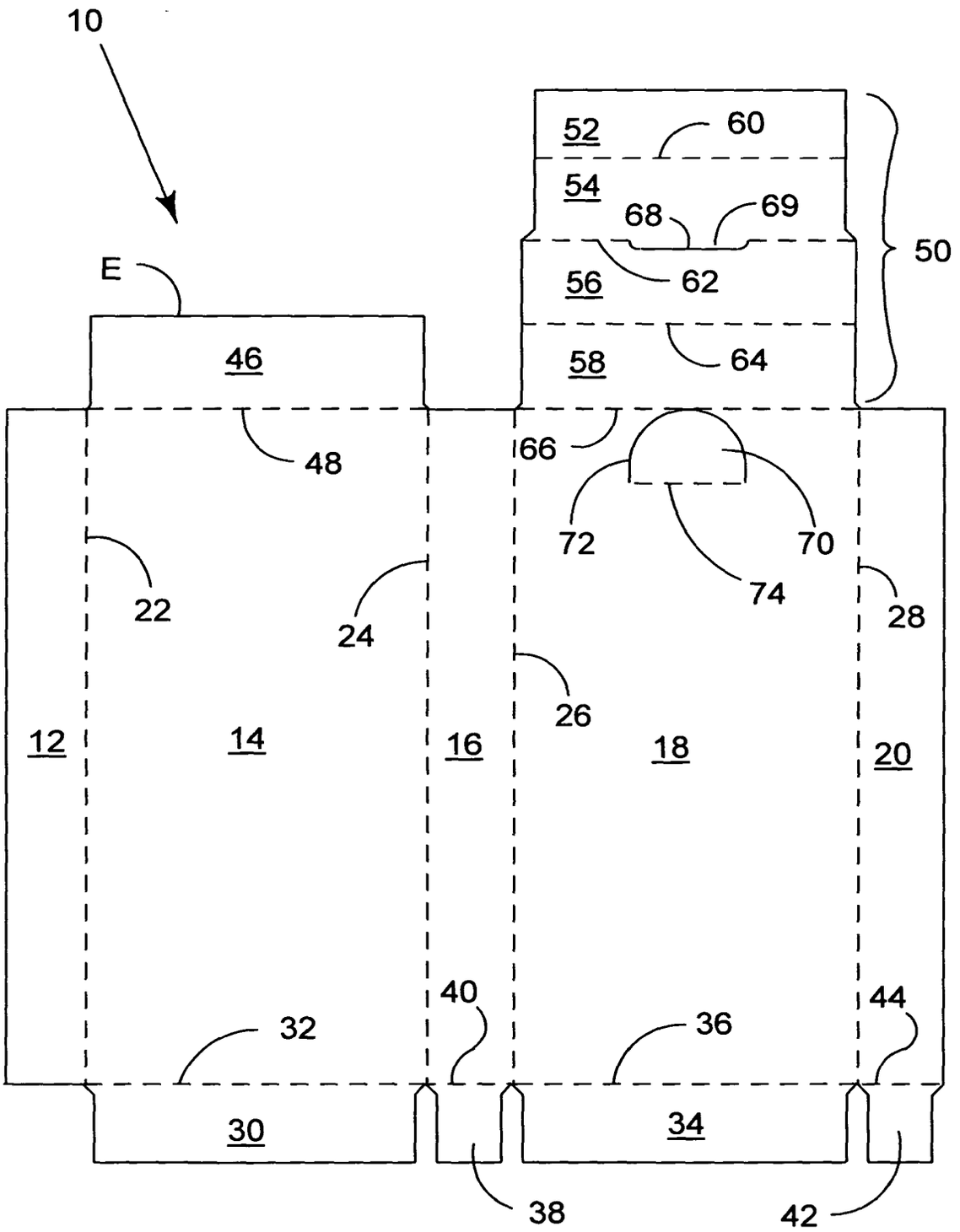
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FIGURE 1

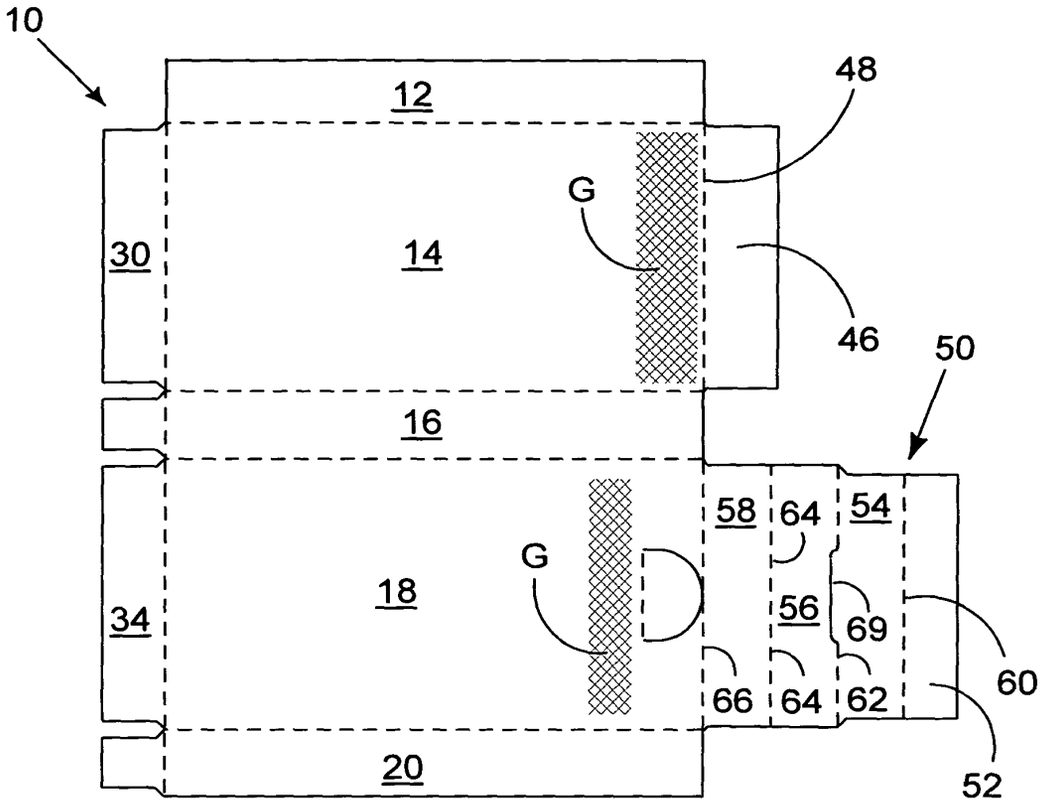


FIGURE 2

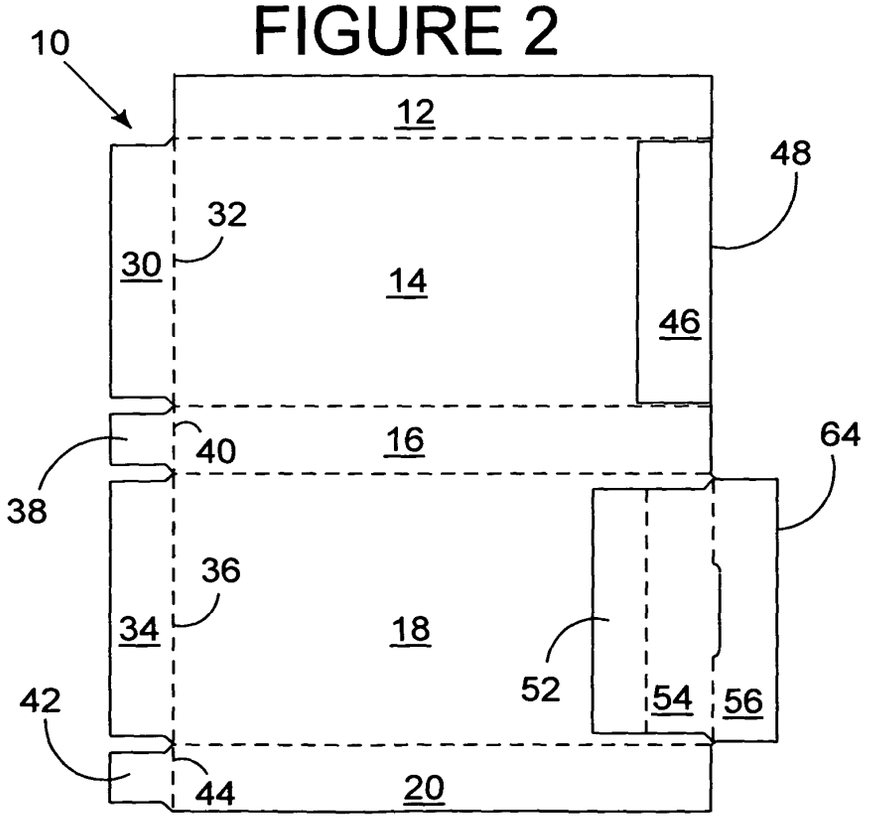


FIGURE 3

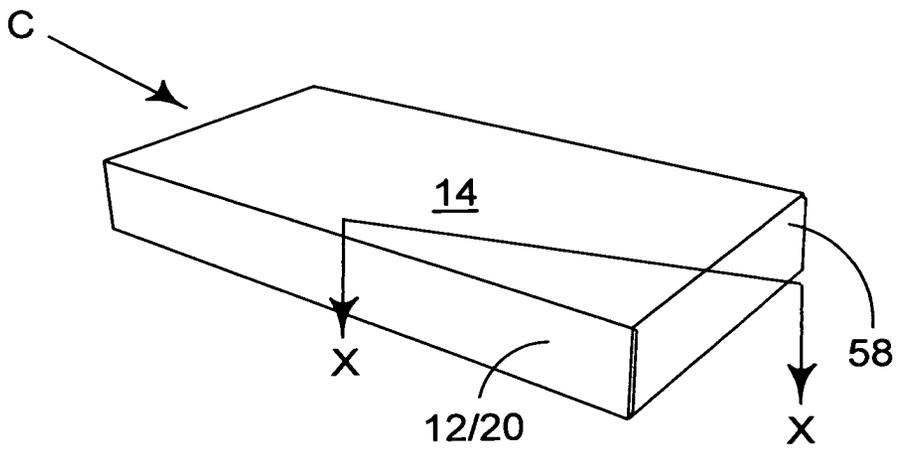


FIGURE 4

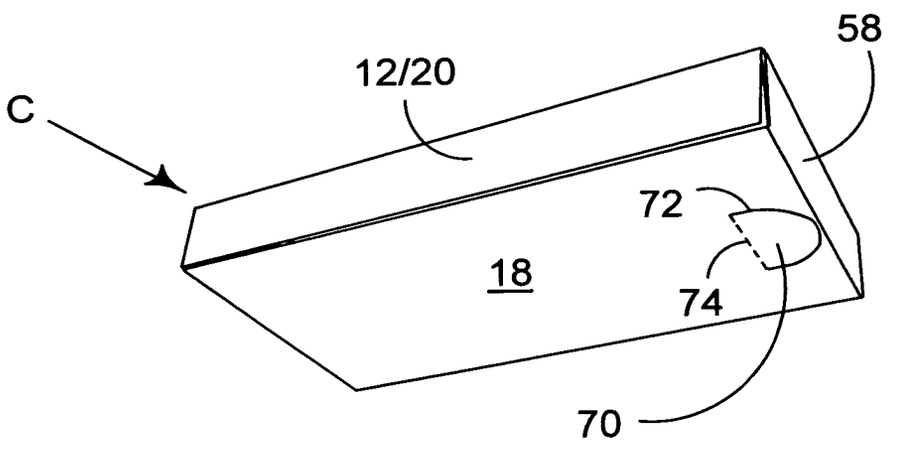


FIGURE 5

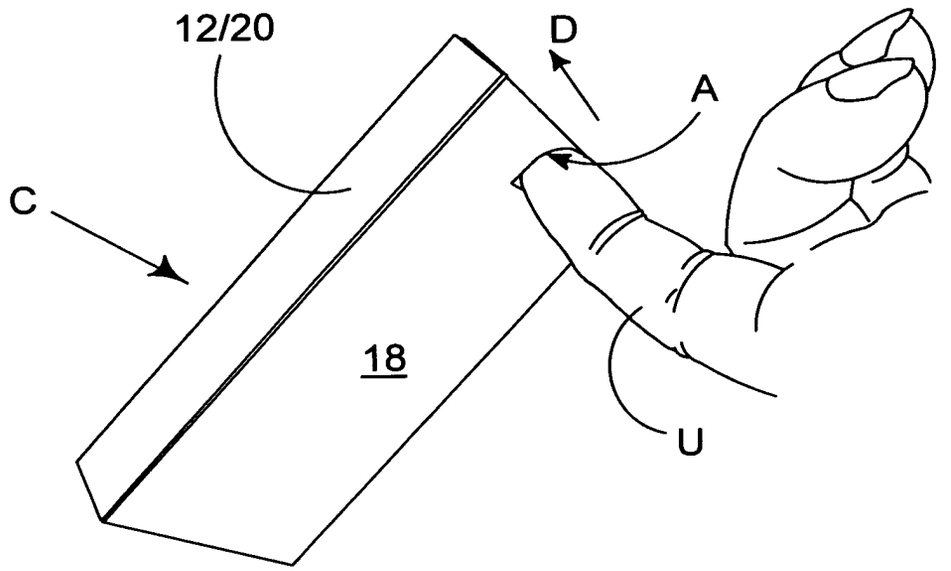


FIGURE 6

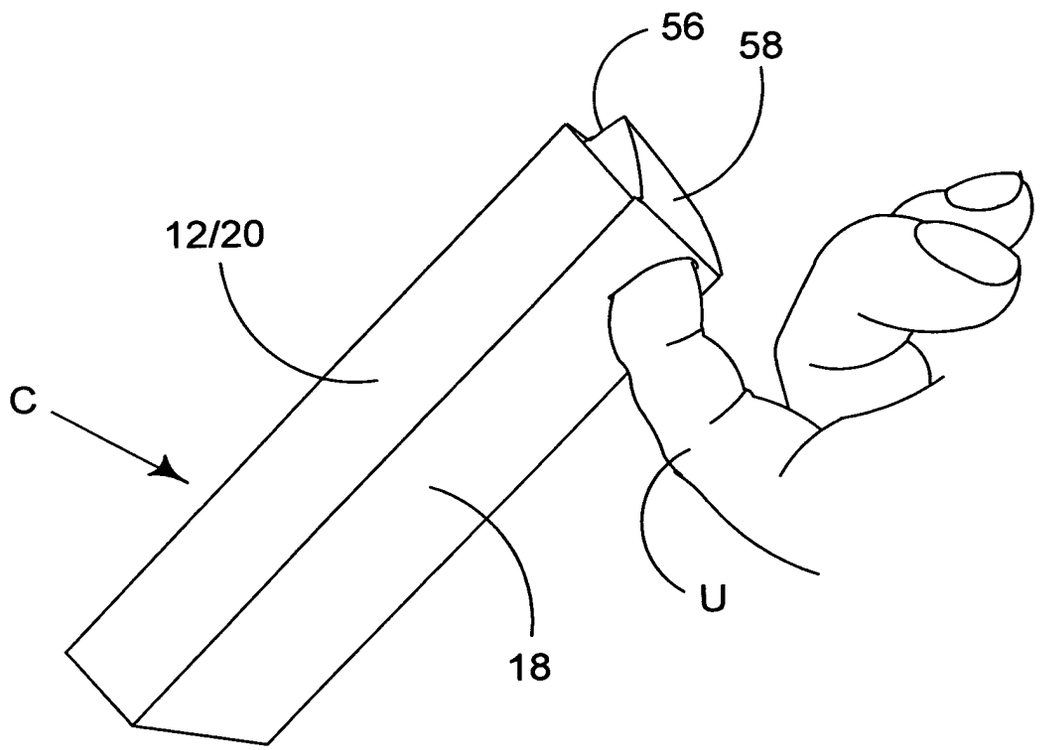


FIGURE 7

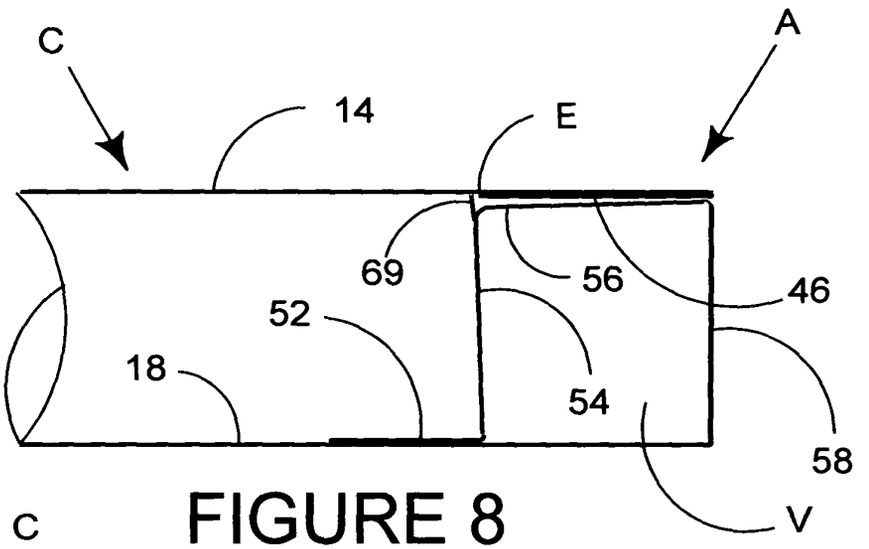


FIGURE 8

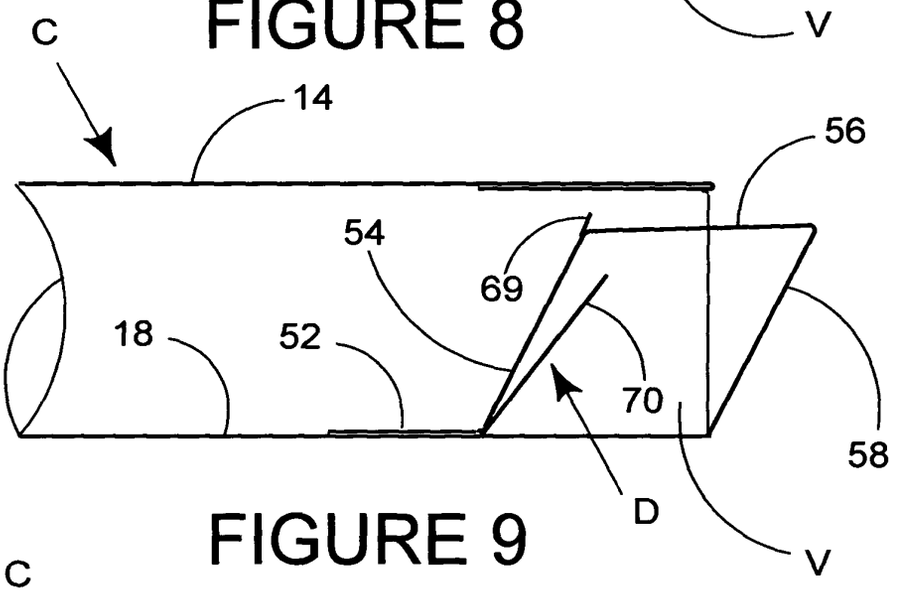


FIGURE 9

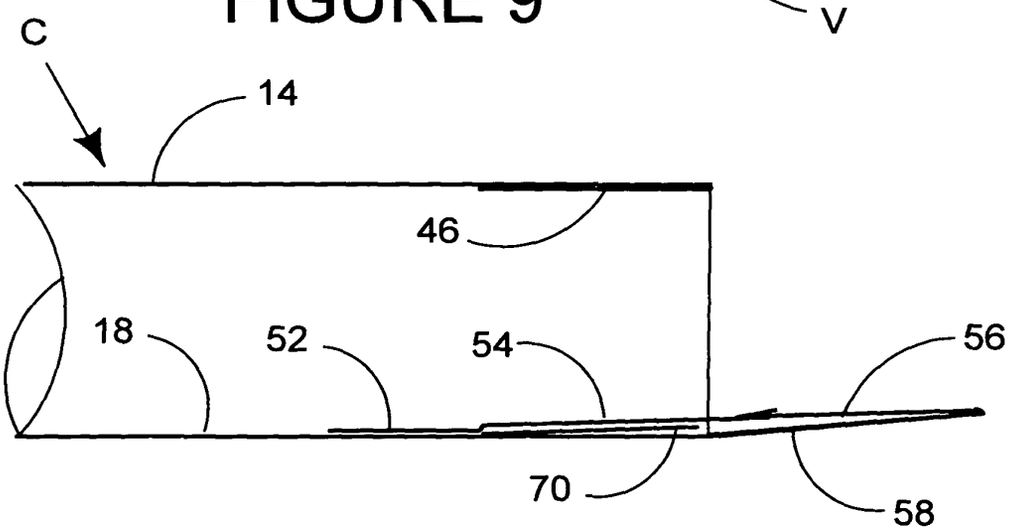


FIGURE 10

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# EUROPEAN SEARCH REPORT

Application Number
EP 03 01 3824

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
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| A | * page 2, column 1, line 37-53 * * page 3, column 1, line 47-60 * * page 3, column 1, line 72 - column 2, line 6 * * figures 1-9,19-21 * | 10-12 | |
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| A | * page 5, paragraph 2 * * figures 1-5 * | 10-12 | |
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| A | * column 1, line 69 - column 2, line 5 * * column 2, line 41-65 * * column 3, line 29-36 * * figures 4-7 * | 5-7 | TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 25 September 2003 | Martens, L |

CATEGORY OF CITED DOCUMENTS

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25-09-2003

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