

(19)



(11)

EP 2 890 618 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

03.08.2016 Bulletin 2016/31

(51) Int Cl.:

B65D 5/66 (2006.01) **B65D 5/68** (2006.01)
B65D 5/355 (2006.01) **B65D 5/22** (2006.01)
B65D 5/26 (2006.01) **B65D 5/54** (2006.01)

(21) Application number: **13792444.5**

(86) International application number:

PCT/IB2013/058150

(22) Date of filing: **30.08.2013**

(87) International publication number:

WO 2014/033674 (06.03.2014 Gazette 2014/10)

(54) **BOX FOR PACKAGING MULTIPLE FORMAT**

VERPACKUNGSSCHACHTEL FÜR MEHRERE FORMATE

BOÎTE POUR EMBALLAGE MULTIFORMAT

(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**

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(30) Priority: **30.08.2012 IT FI20120174**

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(43) Date of publication of application:

08.07.2015 Bulletin 2015/28

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Description

Field of the invention

[0001] The present invention refers to the field of packing, in particular boxes made of rigid or semi-rigid material.

Description of the prior art

[0002] Packing boxes, in various rigid and semi-rigid material, are largely used to transport an almost unlimited number of commercial items; they are usually available in open form, and are thus essentially made of sheets of the desired material, in which punchings are present to allow the folding of the material and possibly the engagement of the different parts to each other, in order to rapidly form the respective box.

[0003] Shape and dimensions of the box are thus univocally determined by the dimensions of the sheets and by the punchings they have.

[0004] There are no boxes on the market, however, which have the possibility to obtain different configurations with the same layout, except traditional packages of the American type, which can vary the height of their closing.

[0005] It is evident, on the contrary, how it would be useful to make, with a single sheet, boxes having different shape according to the needs.

[0006] Boxes formed from one single sheet of material and that can have two different sizes are known from AU 2009100873, US 2007/0267471 and US 2003/0121961.

Brief description of the Figures

[0007]

Fig. 1 - shows the sheet for making a box according to the invention.

Fig. 2 - shows the lid for the a box having a bigger size.

Fig. 3 (a - i)- shows the assembly, starting from a sheet according to figure 1, of a box having a bigger size.

Fig. 4 (a - g)- shows the assembly, starting from a sheet according to figure 1, of a box having a smaller size.

Summary of the invention

[0008] The present description describes boxes that can vary their shape and size according to how the sheets forming them are folded, by virtue of the presence of multiple punchings appropriately arranged, and wherein at least a portion of said punchings can be easily sheared.

Detailed description of the invention

[0009] The present invention allows to solve the aforementioned problem by means of boxes that can vary their shape and size according to how the sheets forming them are folded, by virtue of the presence of multiple punchings appropriately arranged, and wherein at least a portion of said punchings can be easily sheared. The invention refers also, of course, to said sheets for making the boxes as described above, which are according to claim 1 and which, for a greater convenience, will be described in the following by means of the description of the boxes that they allow to form.

[0010] As in can be seen in figure 1, a box according to the invention is made by a sheet of rigid or semi-rigid material appropriately divided by punchings allowing its folding (according to the final size that is desired) and wherein at least a portion of said punchings can be easily sheared.

[0011] For rigid or semi-rigid material it has to be understood, according to the invention, cardboard, corrugated board, plastic material and material made of mixed cardboard and plastic material.

[0012] More in particular, the box according to the invention is made by a rectangular shaped sheet having:

- a rectangular central body 10,
- two wings having the same dimensions 12 arranged along the opposite longer sides of said central body 10 and joined to it by means of two punchings 13 and a shearable punching portion 33,
- two wings 14 having the same dimensions arranged on the two shorter sides of the same central body 10 and joined to it by means of a corresponding punching.

[0013] The wings 12 will make the lateral walls of the final box (both the larger and the smaller).

[0014] The central body 10 is divided into 4 sections by punching lines parallel to each other and perpendicular to the punchings 13.

[0015] More in particular, by starting from one of the wings 14 we can distinguish:

- a first section 16 having the same dimensions as the wings 14;
- a second section 17 (which will make the edge of the smaller box or which will be part of the bottom of the larger box);
- a third section 18 (which will make the bottom of the smaller box and a part of the bottom of the larger box);
- a fourth and last section 19 having the same dimensions as the adjacent wing 14.

[0016] The wings 12 are in turn divided into 4 sections, corresponding to the ones described above for the central body, by punching lines parallel to each other and

perpendicular to the punchings 13.

[0017] More in particular, the aforementioned wings 12 have:

- a first section 20 having the same height as the corresponding section 12, free to fold on the corresponding punching 21;
- a second section 22 joined to the respective section 17 of the central body 10 by means of a punching that can be easily sheared 33;
- a third section 23 punched with respect to the corresponding section 18 of the central body 10;
- a fourth section 24 analogous to the aforementioned first section 20.

[0018] Each section 20 has an engagement notch 25 which allows to the two sections 20 of the wings 12 to engage with each other once they are appropriately folded on the respective punching.

[0019] The section 23 has a foldable edge 26 on the respective punching, while each wing 14 has two protrusions 27 arranged symmetrically and able to engage with corresponding cuts 28 made in the punching that divides the sections 16 and 17 and the sections 18 and 19.

[0020] Furthermore, in the central part of the wings, and of the respective adjacent sections 16 and 19 of the central body 10, openings 11 are present which serve as holders in order to facilitate the box transportation.

[0021] Obtaining the box with the desired size (larger or smaller) is evident by the positioning of the punchings as described above and is, for the sake of clarity, schematized in the figures 3 and 4.

[0022] In order to obtain the box with the larger size (see figure 3) it will be enough to fold the wings 12 (3 b) upwards and thus to fold the sections 20 (3 c and 3 d) inwards, in order to fold the wings 14 over them by engaging the protrusions 27 in the respective cuts 28 (3 e).

[0023] On the contrary, if the smaller box is desired, it will be enough to proceed on one side as explained above, by folding the sections 24 (4 b) and engaging on them the respective wing 14 (4 c), and on the other side by shearing the punch portion 33 that joins the sections 22 and 17 (4 d) and then by folding the sections 20 and 22 inwards, along the punching that delimits the section 18, by engaging them to each other by virtue of the engagement notches 25 (4 e), and after that by folding on them the section 17, while the section 16 and the adjacent wing 14 will form the lid of the box (a f and 4 g).

[0024] In order to keep more easily the lid in its position, it is preferable that the external edge of a wing 14 has a tongue 29 which will be able to engage with a corresponding opening 30 made in the punch that joins the opposite wing 14 to the respective adjacent section 19.

[0025] In the case of the larger box, it is possible to provide a lid as shown in figure 2 made by a rectangular central body 31 and four wings that can be folded on said central body 31.

[0026] The size of the central body will correspond to

the size of the sections 17 and 18 which form, as it was seen, the bottom of the bigger box.

[0027] The two wings arranged along the shorter sides of the central body, will have in the middle the opening for holding the box, while the wings arranged on the longer sides will have two foldable ends 32 projecting with respect to the central body 31. Preferably the four wings will have appropriately shaped corners, in order to facilitate their fitting as described in the following.

[0028] In order to obtain the desired cover for the bigger box, it will be enough to fold two of the ends 32 inwards, and then inserting them in the space between the wings 14 and the respective sections 16 and 19, once made the folding as described above (3 f - 3 g); the two wings with the holder will be able to be either inserted in the box or kept outside it (3 h - 3 i).

[0029] A particular application relates to storage and collection of sacs of human plasma at transfusion centres.

[0030] Currently the storage of frozen sacs of human plasma in the deepfreezers of Italian transfusion centres takes place in plastic bags, which, due to the extreme storage temperatures (from -25°C to -80°C), undergo a vitrification process which undermines their structure, generating the possibility of sudden breaks. This often determines a damage of the sacs of plasma they contain, as a consequence of their fall.

[0031] The bags taken out of the deepfreezers are then packed by Kedrion's personnel in traditional cardboard boxes, and then loaded on Kedrion's trucks at a temperature of -30°C.

[0032] In different nations, the sacs can be frozen in cartons of the punched type, but having a non modifiable shape.

[0033] The first solution, storage in plastic bags, has the advantage to exploit the filling capacity of the different deepfreezers to the outmost, but the lack of a precise order in arranging the sacs within the bags determines an irregular freezing, making the frozen bag have an incorrect shape.

[0034] On the other hand, the low-temperature vitrification process explained above, determines an exaggerated fragility of the bags with consequent breakings.

[0035] The solution adopting punched cartons, actuated in other nations, solves the problem of the breaking of plastic bags and reduces the exposition of the frozen sacs to the ambient temperature, apart from accelerating the operations of loading and unloading. The boxes used, however, have one single shape, which limits their use in deepfreezers that have different shape and capacity, and determines unused spaces also in deepfreezers with compatible compartments, reducing their filling capacity.

[0036] The box as described above can be put directly in the deepfreezers at -30°C and, by virtue of its flexibility, it can adapt to deepfreezers of different type with different dimensions, being able to adapt to different spaces, and it can be used in all the fields, either industrial or not, whenever a container able to adapt to the available space

is needed.

Claims

1. Sheet made of rigid or semi-rigid material comprising a plurality of punchings appropriately arranged able to allow the reciprocal folding of portions of said sheet in order to form two boxes, one bigger than the other, at least a portion of said punchings being easily shearable, and comprising:

- a rectangular central body (10),
- two wings having the same dimensions (12) arranged along the opposite longer sides of said central body (10) and joined to it by means of two punchings (13) and a shearable punching portion (33),
- two wings (14) having the same dimensions arranged on the two shorter sides of the same central body (10) and joined to it by means of a corresponding punching (15),

wherein said central body (10) is divided into four sections (16, 17, 18, 19) by punching lines parallel to each other and perpendicular to the punchings (13) and said wings (12) are in turn divided into four sections (20, 22, 23, 24) by punching lines parallel to each other and perpendicular to the punchings (13) **characterised in that:**

two sections (20) have an engagement notch (25) which allows to these two sections (20) of the wings (12) to engage with each other once they are appropriately folded on the respective punching, and
one section (23) has an edge (26) that can be folded on the respective punching, while each wing (14) has two projections (27) arranged symmetrically and able to engage with corresponding cuts (28) made in the punching that divides some sections (16) and (17) from other sections (18) and (19) and wherein in the central part of the wings (14) and of the respective adjacent sections (16, 19) of the central body (10) openings (11) are present which serve as a holder to facilitate the box transportation.

2. Sheet according to claim 1, wherein said rigid or semi-rigid material is chosen among: cardboard, corrugated board, plastic material and material made of mixed cardboard and plastic material.
3. Process to obtain a corresponding box from a sheet according to claims 1-2 wherein:
- wings (12) are folded upwards and sections (20) are folded inwards in order to fold the wings

(14) over them engaging the projections (27) in the respective cuts (28).

4. Process to obtain a corresponding box from a sheet according to claims 1-2 wherein:

- on one side the sections (24) are folded engaging on them the respective wing (14);
- on the side opposite to the aforementioned one, the punching portion (33) joining the sections (22) and (17) is sheared, and the sections (20) and (22) are folded inwards according to the punching that delimits the section (18) reciprocally engaging the sections by means of the engagement notches (25);
- the section (17) is folded on the sections (20) and (22)
- the section (16) and the adjacent wing (14) once folded form the lid of the box.

5. Boxes obtained by using the sheets according to claims 1-2.

Patentansprüche

1. Bogen aus steifem oder halbsteifem Material, welcher eine Vielzahl von Stanzungen aufweist, die passend angeordnet sind, um die wechselseitige Faltung von Bereichen des Bogens zu ermöglichen, so dass zwei Schachteln - eine grösser als die andere - gebildet werden können, wobei mindestens ein Bereich der Stanzungen leicht zu schneiden ist, sowie aufweisend:

- ein rechteckiges Mittelteil (10),
- zwei Seitenlaschen mit gleicher Größe (12), welche an den gegenüberliegenden Längsseiten des Mittelteils (10) angeordnet und mit diesem durch zwei Stanzungen (13) und einem schneidbaren Stanzbereich (33) verbunden sind,
- zwei Seitenlaschen mit gleicher Größe (14), welche an den beiden gegenüberliegenden kurzen Seiten des Mittelteils (10) angeordnet und mit diesem durch entsprechende Stanzungen (15) verbunden sind, wobei das Mittelteil (10) durch Stanzlinien in vier Abschnitte (16, 17, 18, 19) unterteilt ist, die parallel zueinander und rechtwinklig zu den Stanzungen (13) sind, und die Seitenlaschen (12) ihrerseits durch Stanzlinien in vier Abschnitte (20, 22, 23, 24) unterteilt sind, die parallel zu einander und rechtwinklig zu den Lochungen (13) sind,

dadurch gekennzeichnet, dass:

- zwei Abschnitte (20) einen Verbindungsschlitz (25) haben, der den beiden Abschnitten (20) der Seitenlaschen (12) ermöglicht ineinander zu greifen, wenn sie an der entsprechenden Stanzung passend gefaltet wurden, und ein Abschnitt (23) eine Kante (26) aufweist, die an der entsprechenden Stanzung gefaltet werden kann, wobei jede Seitenlasche (14) zwei symmetrisch angeordnete Vorsprünge (27) aufweist, die mit zugehörigen Einschnitten (28) verbunden werden können, welche in jene Stanzung gemacht wurden, die einige Abschnitte (16) und (17) von anderen Abschnitten (18) und (19) trennt, wobei im zentralen Teil der Seitenlaschen (14) und der entsprechenden angrenzenden Abschnitte (16, 19) des Mittelteils (10) Öffnungen (11) vorhanden sind, welche als Griff dienen, um den Transport der Schachtel zu erleichtern.
2. Bogen nach Anspruch 1, wobei das steife oder halbsteife Material aus folgenden Materialien ausgewählt wird: Karton, Wellpappe, Kunststoff und gemischtes Material aus Karton und Kunststoff.
3. Verfahren, um aus einem Bogen eine entsprechende Schachtel, gemäß den Ansprüchen 1 und 2 zu erhalten, wobei:
- Seitenlaschen (12) nach oben und Abschnitte (20) nach innen gefaltet werden, um die Seiten (14) darüber zu falten, so dass die Vorsprünge (27) in die zugehörigen Einschnitte (28) eingreifen.
4. Verfahren, um aus einem Bogen eine entsprechende Schachtel, gemäß den Ansprüchen 1 und 2 zu erhalten, wobei:
- auf einer Seite die Abschnitte (24) so gefaltet sind, dass auf ihnen das zugehörige Seitenteil (14) eingreift;
 - der Stanzbereich (33) auf der gegenüberliegenden der vorgenannten Seite, welcher die Teilstücke (22) und (17) verbindet, geschnitten wird und die Abschnitte (20) und (22) nach innen gemäß der Stanzung, die den Abschnitt (18) begrenzt, gefaltet werden, und reziprok die Abschnitte durch die Verbindungsschlitz (25) verbunden werden;
 - der Abschnitt (17) auf die Abschnitte (20) und (22) gefaltet wird
 - der Abschnitt (16) und die angrenzende Seitenlasche (14) nach dem Falten den Deckel der Schachtel bilden.
5. Schachteln, die aus Bögen gemäß Ansprüche 1 bis 2 erhalten werden.

Revendications

1. Feuille réalisée à partir d'un matériau rigide ou semi-rigide comprenant une pluralité de poinçonnements agencés de manière appropriée, capables de permettre le pliage réciproque des parties de ladite feuille afin de former deux boîtes, une plus grande que l'autre, au moins une partie desdits poinçonnements pouvant être facilement coupées, et comprenant :

un corps central rectangulaire (10),
deux ailes ayant les mêmes dimensions (12) agencées le long des côtés plus longs opposés dudit corps central (10) et assemblées à ce dernier au moyen de deux poinçonnements (14) et d'une partie de poinçonnement pouvant être coupée (33),
deux ailes (14) ayant les mêmes dimensions, agencées sur les deux côtés plus courts du même corps central (10) et assemblées à ce dernier au moyen d'un poinçonnement (15) correspondant,
dans laquelle ledit corps central (10) est divisé en quatre sections (16, 17, 18, 19) par des lignes de poinçonnement parallèles entre elles et perpendiculaires aux poinçonnements (13) et lesdites ailes (12) sont, à leur tour, divisées en quatre sections (20, 22, 23, 24) par des lignes de poinçonnement parallèles entre elles et perpendiculaires aux poinçonnements (13), **caractérisée en ce que :**

deux sections (20) ont une encoche de mise en prise (25) qui permet à ces deux sections (20) des ailes (12) de se mettre en prise une fois qu'elles ont été pliées de manière appropriée sur le poinçonnement respectif, et une section (23) a un bord (26) qui peut être plié sur le poinçonnement respectif, alors que chaque aile (14) a deux saillies (27) agencées de manière symétrique et pouvant se mettre en prise avec des découpes (28) correspondantes réalisées dans le poinçonnement qui divise certaines sections (16) et (17) des autres sections (18) et (19), et dans laquelle dans la partie centrale des ailes (14) et des sections (16, 19) adjacentes respectives du corps central (10), on trouve des ouvertures (11) qui servent de support afin de faciliter le transport de la boîte.

2. Feuille selon la revendication 1, dans laquelle ledit matériau rigide ou semi-rigide est choisi parmi : le carton, le carton ondulé, une matière plastique et un matériau composé de carton et de matière plastique mélangés.

3. Procédé pour obtenir une boîte correspondante à partir d'une feuille selon les revendications 1 à 2, dans lequel :

des ailes (12) sont pliées vers le haut et des sections (20) sont pliées vers l'intérieur afin de plier les ailes (14) sur elles en mettant en prise les saillies (27) dans les découpes (28) respectives.

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4. Procédé pour obtenir une boîte correspondante à partir d'une feuille selon les revendications 1 à 2, dans lequel :

d'un côté, les sections (27) sont pliées, en mettant en prise sur ces dernières, l'aile (14) respective ;

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sur le côté opposé au côté mentionné précédemment, la partie de poinçonnement (33) assemblant les sections (22) et (27) est coupée, et les sections (20) et (22) sont pliées vers l'intérieur selon le poinçonnement qui délimite la section (18) mettant en prise de manière réciproque les sections au moyen des encoches de mise en prise (25) ;

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la section (17) est pliée sur les sections (20) et (22),

la section (16) et l'aile (14) adjacente une fois pliée, forment le couvercle de la boîte.

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5. Boîtes obtenues en utilisant les feuilles selon les revendications 1 à 2.

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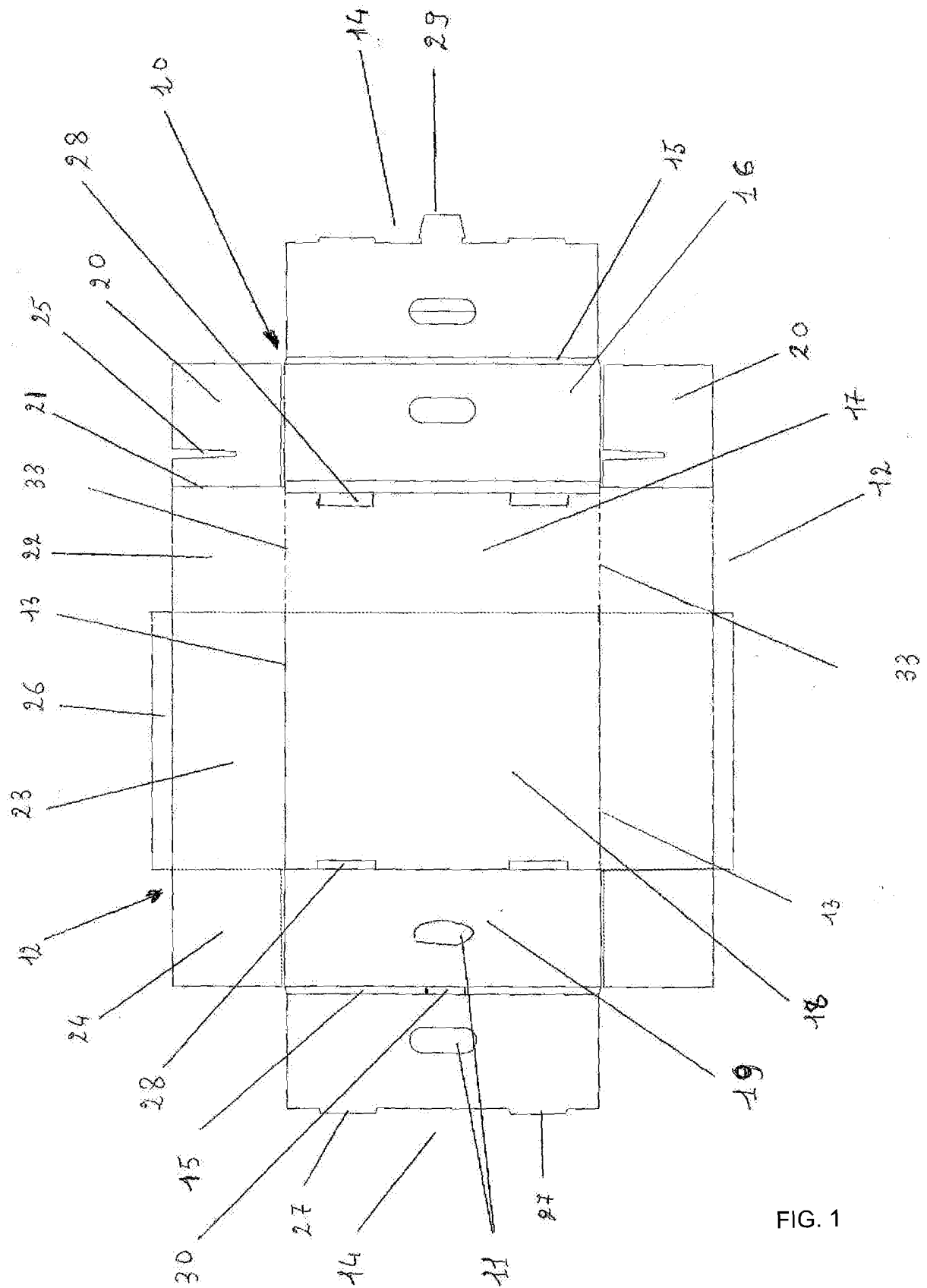


FIG. 1

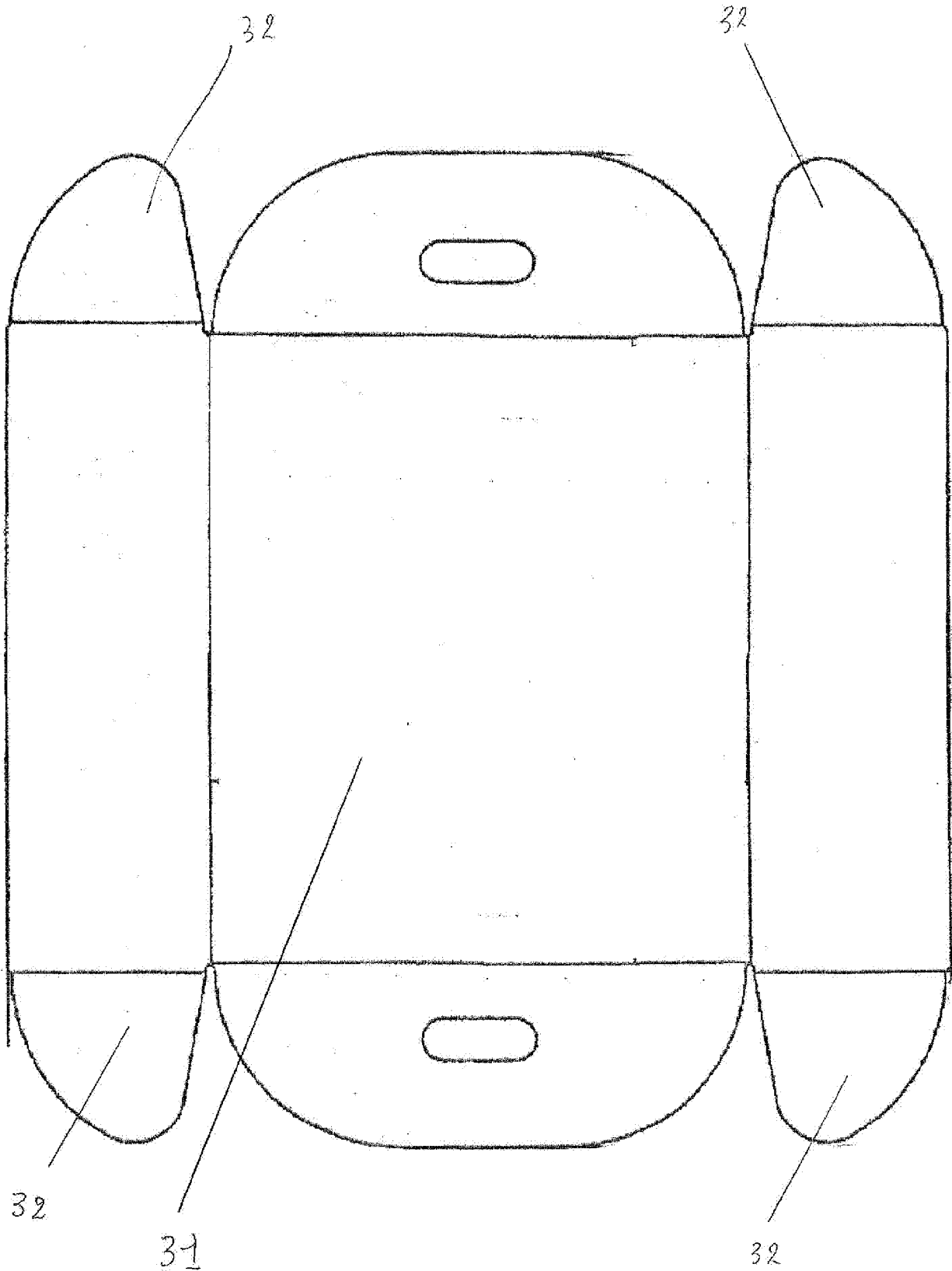


FIG. 2

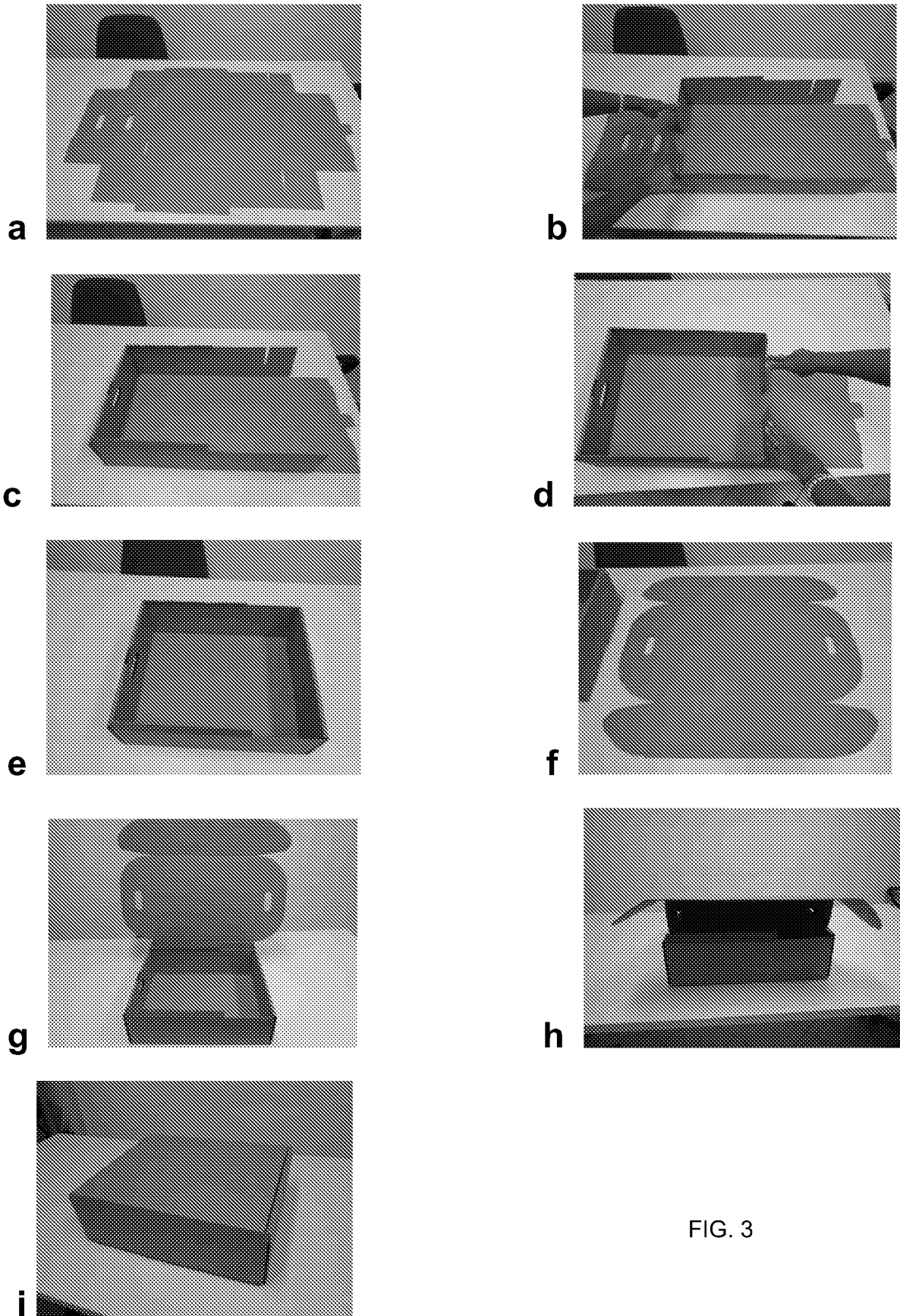


FIG. 3

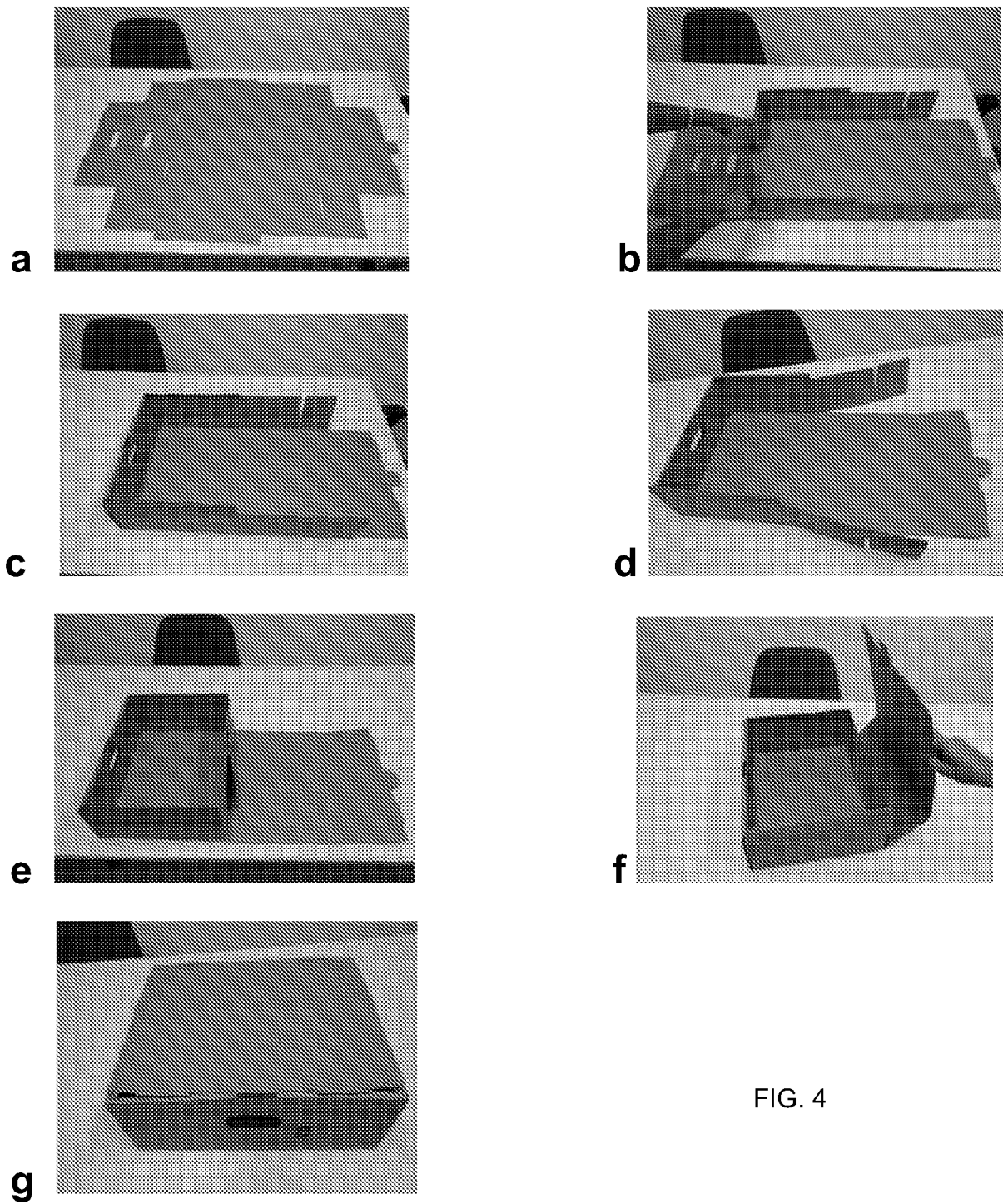


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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