



(51) International Patent Classification:

B65D 5/50 (2006.01) B65D 71/72 (2006.01)

(21) International Application Number:

PCT/IT2024/050134

(22) International Filing Date:

02 July 2024 (02.07.2024)

(25) Filing Language:

Italian

(26) Publication Language:

English

(30) Priority Data:

102023000013242 04 July 2023 (04.07.2023) IT

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: METHOD FOR MAKING A SUPPORT TRAY

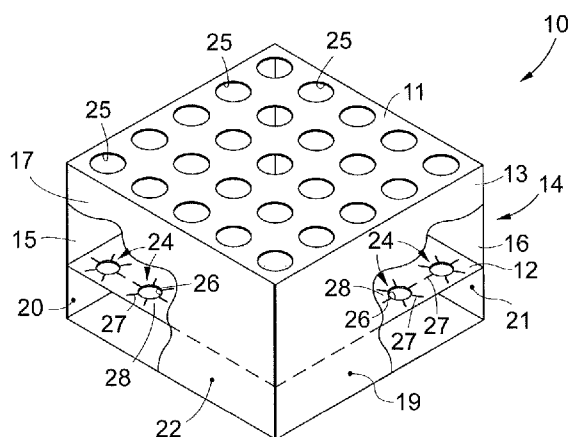


fig. 1

(57) Abstract: Method for making a support tray (10) for elongated products (200), in particular smoking articles, which provides to make available a support tray (10) provided with a plurality of first holes (25) for positioning the elongated products (200) and a plurality of foldable diaphragms (24), respectively distributed on an upper (11) and lower (12) transverse wall of the support tray (10) which are facing each other. The support tray (10) is also provided with a first (13) and a second (15) side wall opposite each other and perpendicular to the upper (11) and lower (12) transverse wall.



“METHOD FOR MAKING A SUPPORT TRAY”

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FIELD OF THE INVENTION

5 The present invention concerns a method for making a support tray for elongated products, for example tubular or stick or bar shaped, in particular but not exclusively of the flexible or deformable type, for example smoking articles such as cigarettes, cigars, cigarillos or suchlike.

BACKGROUND OF THE INVENTION

10 Packages, or packets, for containing elongated products, for example tubular or stick or bar shaped, for example smoking articles, such as cigarettes, cigars, cigarillos, or suchlike are known.

In the case of smoking articles, these are normally grouped in such a way as to define, as a whole, a parallelepiped, around which an internal containing casing, or internal wrapper, is then wrapped, which is then inserted into an external
15 containing body, thus forming the packet.

However, a disadvantage of such known packets is that they are not suitable to contain elongated products of the type in question and having a variable cross-section, for example having a frustoconical shape, because, since these products are arranged against each other, each smoking article could be crushed and/or
20 ruined, thus compromising its integrity.

In this regard, solutions are known that provide a box-shaped package in which there is a support tray having an upper wall and a lower wall, both parallel to the bottom of the containing body and provided with a plurality of positioning holes for the elongated products, keeping them positioned individually and, therefore,
25 separated from each other. The holes made on one or both of such upper and lower walls can comprise deformable flaps that bend when the products are inserted into the holes.

Packages of this type are described in US patent documents US 5,725,109, US 7,028,839 and USD 881,021.

30 However, known solutions have the disadvantage that they are quite complex and that special, bulky and expensive equipment is required to manufacture them.

Furthermore, the methods for making such support trays or the respective packages, as well as for preparing such trays to receive and support the elongated

products, can be rather elaborate and complex.

There is therefore the need to perfect a method for making a support tray that can overcome at least one of the disadvantages of the state of the art.

In particular, one purpose of the present invention is to perfect a method for making a support tray which is simple and has low production costs.

Another purpose of the present invention is to perfect a method for making a support tray which is highly efficient.

Another purpose of the present invention is to perfect a method for making a support tray, wherein the latter is able to support such elongated products, in particular if they are flexible and/or deformable, allowing for a simple and rapid positioning thereof.

The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

The present invention is set forth and characterized in the independent claims. The dependent claims describe other characteristics of the present invention or variants to the main inventive idea.

In accordance with the above purposes and to resolve the technical problem disclosed above in a new and original way, also achieving considerable advantages compared to the state of the prior art, there is perfected a method according to the present invention for making a support tray for elongated products, in particular smoking articles.

In accordance with one aspect of the present invention, the method comprises providing a support tray having an upper transverse wall and a parallel lower transverse wall facing each other, the support tray being provided with a plurality of first holes for positioning the elongated products and a plurality of foldable diaphragms, respectively distributed on the upper and lower transverse walls of the support tray, opposing each other.

According to one aspect of the present invention, the method provides to fold the foldable diaphragms by means of folding members which are first axially aligned with the first holes above the upper transverse wall and then actuated to pass through the first holes until the folding members engage and fold the

diaphragms so as to define, on the lower transverse wall, through openings axially aligned with the first holes, through which the elongated products can be easily inserted after removing the folding members.

5 In accordance with another aspect of the present invention, during folding of the diaphragms, contrast members are provided which support the lower transverse wall to prevent damages thereof.

In accordance with some embodiments of the present invention, the contrast members comprise annular rigid portions which encircle the folding members during folding of the diaphragms.

10 In accordance with some embodiments of the present invention, the folding of the diaphragms comprises folding a plurality of contiguous foldable flaps, defined by through radial incisions and hingedly arranged perimetrically around an annular profile.

15 In accordance with other embodiments of the present invention, the foldable flaps circumferentially delimit corresponding second holes axially aligned with the first holes, each first hole having a first diameter greater than a second diameter of each of the second holes. Moreover, folding the foldable flaps enlarges the second holes, forming enlarged holes having a third diameter greater than the second diameter.

20 In accordance with another aspect of the present invention, the method comprises, after folding the diaphragms and removing the folding members, a step of inserting the elongated products into the support tray, wherein the elongated products are inserted through the first holes until engaging, with a respective lower end, the through openings obtained by folding the diaphragms. The elongated
25 products having of a frustoconical shape.

In accordance with another aspect of the present invention, the support tray is obtained from a single planar blank comprising: a first main panel provided with a plurality of first holes; a second main panel aligned with the first main panel and provided with the plurality of foldable diaphragms; a first and a second larger
30 central panel connected, on opposite sides, to the first main panel; a first and a second smaller central panel connected, on opposite sides, to the second main panel, the first larger central panel being contiguously adjacent to the first smaller central panel, wherein the first and second smaller central panels are superimposed

and joined with glue respectively to a lower end portion of the first and second larger central panel, thus forming respectively a first and a second side wall opposite each other, perpendicular to the upper and lower transverse wall, and extending from the upper transverse wall beyond the lower transverse wall so as to define respective support legs.

In accordance with another aspect of the present invention, the method comprises a shaping step in which the planar blank, starting from a flattened configuration, is shaped into a three-dimensional upright configuration, determining the support tray's geometry. In particular, in the shaping step, the first and the second main panel of the planar blank, partially superimposed and in contact with each other, are separated from each other and spaced apart to put each other in parallel, thus forming the upper and lower transverse wall which, in the upright configuration, are perpendicular to the first and second side wall.

In accordance with another aspect of the present invention, the method comprises further folding steps, after the shaping step, in which a first and a second smaller side panel connected, on opposite sides, to the second main panel of the planar blank are folded towards the respective support legs, and in which a first and a second larger side panel connected, on opposite sides, to the first main panel of the planar blank are folded so that a respective lower end portion thereof is superimposed and stably joined with glue to the first and second smaller side panel, respectively, thus forming respectively a third and a fourth side wall of the support tray and defining further respective support legs.

In accordance with another aspect of the present invention, each of the folding member protrudes from a movable common support so as to fold the plurality of diaphragms in a single step when moving the movable common support.

In accordance with another aspect of the present invention, each of the folding members has an elongated substantially cylindrical shape and is dimensioned to pass with clearance through the first holes.

In accordance with another aspect of the present invention, each of the folding members has an end portion with a frustoconical shape.

In accordance with another aspect of the present invention, the elongated products have a frustoconical shape and are made of flexible or deformable material.

DESCRIPTION OF THE DRAWINGS

These and other aspects, characteristics and advantages of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- 5 - fig. 1 is a three-dimensional view of a support tray for elongated products, made by means of the method according to the present invention;
- fig. 2 is a three-dimensional section view of the support tray of fig. 1;
- fig. 2a is a three-dimensional section view of the support tray of fig. 1 according to another embodiment;
- 10 - fig. 3 is a three-dimensional section view of the support tray of fig. 1 provided with a plurality of elongated products;
- figs. 3a and 3b are enlarged detailed views of fig. 3, in which construction details of the support feet of the support tray of fig. 1 are visible;
- fig. 4 is a top view of a suitably shaped planar blank, from which the support tray
- 15 of fig. 1 is obtained;
- figs. from 5 to 15 are a schematic representation of an operating sequence that defines the method for making the support tray of fig. 1;
- figs. from 16 to 18 are a schematic representation of an operating sequence of preparing the support tray of fig. 1 for insertion of the elongated products.

20 We must clarify that the phraseology and terminology used in the present description, as well as the figures in the attached drawings also in relation as to how described, have the sole function of better illustrating and explaining the present invention, their purpose being to provide a non-limiting example of the invention itself, since the scope of protection is defined by the claims.

25 To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can be conveniently combined or incorporated into other embodiments without further clarifications.

DESCRIPTION OF SOME EMBODIMENTS OF THE PRESENT INVENTION

30 With reference to fig. 1, a support tray 10 is suitable to support elongated products 200 in a substantially upright position.

According to possible embodiments, the support tray 10 is insertable into a containing body 101, thereby forming a box-shaped package 100 (fig. 15)

containing the plurality of elongated products 200.

The oblong or elongated products 200 can, for example, be tubular or stick or bar shaped, in particular but not exclusively of a flexible or deformable type, and comprise a lower end 201 and an upper end 202 (figs. 3, 14 and 18). According to
5 preferred embodiments, the elongated products 200 are smoking articles with a frustoconical shape, wherein the lower end 201 is defined by the mouth end, which is able to be brought at the mouth of the consumer and which can be provided with a filter, and the upper end 202 is defined by the lighting end, which can be lit to smoke the smoking article. As shown, the lower end 201 has a smaller cross-
10 section than the upper end 202.

The support tray 10 is made starting from a single flexible planar blank 110 (fig. 4), as will be described in detail below.

Preferably, the planar blank 110 is made of a sheet material, for example cardboard, paperboard, paper or similar materials, and has a thickness such that it
15 can be easily folded, while guaranteeing that a sufficiently rigid and resistant structure is created, capable of supporting the elongated products 200.

In particular, the planar blank 110 is shaped and folded in such a way that the support tray 10 (fig. 1) essentially comprises an upper transverse wall 11, a lower transverse wall 12 parallel and opposing the latter, and at least a first side wall 13
20 and a second side wall 15 opposing each other and perpendicular to the upper and lower transverse wall 11, 12.

The support tray 10 has a parallelepiped shape, wherein the upper and lower transverse wall 11, 12, and the first and second side wall 13, 15 can have a rectangular, or square, shape.

25 The first and second side wall 13, 15 have respective lower end parts which extend beyond the lower transverse wall 12, on the opposite side with respect to the upper transverse wall 11, and define two corresponding support feet 19, 20. In particular, each support foot 19, 20 consists of a superimposition and a stable connection with glue of respective portions of at least two panels 113a, 113b, 115a,
30 115b of the planar blank 110 (fig. 3a), as will be described in detail below.

According to preferred embodiments, the support tray 10 also comprises a third side wall 16 and a fourth side wall 17, opposing each other and perpendicular to the first and second side wall 13, 15, thus defining a side skirt 14 around the upper

and lower transverse wall 11, 12.

We must clarify that the third and fourth side wall 16, 17 can also have a rectangular, or square, shape, preferably coordinated with the shape of the first and second side wall 13, 15, so that the support tray 10 has the aforementioned parallelepiped shape. We must clarify that the function of the side walls 13, 15, 16, 17 is to give a certain rigidity to the structure of the support tray 10.

Therefore, the support tray 10 advantageously comprises a further two support feet 21, 22, defined by corresponding lower end parts of the third and fourth side wall 16, 17 which extend beyond the lower transverse wall 12, on the opposite side with respect to the upper transverse wall 11. In particular, each further support foot 21, 22 consists of a superimposition and a stable connection, preferably with glue, of respective portions of at least two panels 116a, 116b, 117a, 117b of the planar blank 110 (fig. 3b), as will be described in detail below.

We must clarify that at least the respective lower end portions of the first, second, third and fourth side wall 13, 15, 16, 17 have a higher stiffness than the upper and lower transverse wall 11, 12.

In this way, the support tray 10 has the advantage of being more stable and of having a structure able to withstand any accidental deformations.

The upper transversal wall 11 is provided with a plurality of first holes 25 defining respective housing seatings for the elongated products 200 (figs. from 1 to 3).

The first holes 25 are arranged according to a certain positioning matrix, for example they are aligned and equally spaced apart from each other so as to homogeneously occupy the entire surface of the upper transverse wall 11. Furthermore, the first holes 25 preferably have a circular shape and a first diameter D1 (figs. 2, 4 and from 16 to 18) having a dimension such as to accommodate each elongated product 200 with clearance.

We must clarify that, in the case of frustoconical shaped smoking articles, the first diameter D1 can have a dimension that is intermediate between the diameter of the lower end 201 and that of the upper end 202.

The lower wall 12 is provided with a plurality of foldable diaphragms 24 (figs. 2 and 2a) configured to define, when folded, corresponding through openings, axially aligned with the first holes 25 and able to allow the insertion of the

elongated products 200.

According to possible embodiments, shown in fig. 2a, the diaphragms 24 comprise a plurality of contiguous deformable flaps 30, defined by radial through incisions 31 and hingedly arranged perimetrically around a closed annular folding
5 profile, wherein the deformable flaps essentially extend up to the center of the closed annular profile.

The function of the deformable flaps 30 of each diaphragm 24 is to elastically fold in order to define a further housing seating for a corresponding elongated product 200, that is, a central through opening having a dimension such as to allow
10 the easy passage thereof, at the same time holding it stably by interference and keeping it stably in an upright position.

According to preferred embodiments, shown for example in figs. 2, 4 and 5, the diaphragms 24 comprise respective second holes 26 which also preferably have a circular shape, and which are axially aligned with the first holes 25 to define further
15 housing seatings for the elongated products 200.

Specifically, the second holes 26 have a second diameter D2 that is smaller than the first diameter D1 of the first holes 25. For example, the second diameter D2 can have a dimension such as to prevent the regular passage of the lower end 201 of the elongated product 200.

20 Therefore, the periphery of the second holes 26 is at least partially delimited by foldable flaps 28 (figs. 2, 4, 17 and 18), defined by corresponding two or more cuts 27. For example, the cuts 27 can be radial cuts.

In particular, the function of the flaps 28 is to elastically fold in order to increase the dimension of the second diameter D2 of each second hole 26, so as to allow an
25 easy passage of the corresponding elongated product 200, while stably holding it by interference (figs. 3 and 18) and keeping it stably in an upright position.

The folding of the flaps 28 therefore forms an enlarged hole 29 having a third diameter D3 (fig. 18) which is greater than at least the second diameter D2 and which allows the facilitated passage of the corresponding elongated product 200.

30 According to possible embodiments, the cuts 27 can have an extension such as to define a closed annular profile, from which the flaps 28 depart, having an external diameter DE also greater than the first diameter D1 of the first holes 25. We must clarify that the external diameter DE is represented ideally in figs. 2 and

4 with a dashed line.

The planar blank 110 (fig. 4), although advantageously in a single body, is suitably shaped and comprises at least: a first main panel 111 which is configured to define, when the planar blank 110 is folded, the upper transverse wall 11; a
5 second main panel 112 aligned with the first main panel 111 along an axis of symmetry X and configured to define, when the planar blank 110 is folded, the lower transverse wall 12; a first larger central panel 113a and a second larger central panel 115a which are connected, on opposite sides, to the first main panel 111, along the axis of symmetry X, and a first smaller central panel 113b and a
10 second smaller central panel 115b which are connected, on opposite sides, to the second main panel 112, along the axis of symmetry X.

We must clarify that the first main panel 111 comprises the plurality of first holes 25, and that the second main panel 112 comprises the plurality of diaphragms 24.

15 According to some embodiments, the first and second larger central panel 113a and 115a, when the planar blank 110 is folded, are configured to define the first and second side wall 13, 15.

Furthermore, the first larger and smaller central panel 113a, 113b are connected to each other and, when the planar blank 110 is folded, the first smaller central
20 panel 113b is configured to be superimposed and stably joined with glue to an end portion of the first larger central panel 113a, thus defining a first support foot 19.

The second larger and smaller central panel 115a and 115b are arranged on opposite sides with respect to each other and, when the planar blank 110 is folded, the second larger central panel 115b is configured to be superimposed and stably
25 joined with glue to an end portion of the second larger central panel 115a, thus defining a second support foot 20.

According to other embodiments, not shown in the drawings, the first and second side wall 13, 15 are respectively defined by the partial superimposition and stable joining with glue of the first and second smaller central panel 113b, 115b
30 with the first and second larger central panel 113a, 115a.

We must specify that, on the first smaller central panel 113b there is a layer of gluing, or adhesive, material M1 which is able to contact the corresponding end portion of the first larger central panel 113a and, when activated, allows to keep

the first smaller central panel 113b glued and stably joined thereto.

Moreover, there is also a layer of gluing, or adhesive, material M1 on the second smaller central panel 115b, which is able to contact the corresponding end portion of the second larger central panel 115a and, when activated, allows to keep the
5 second smaller central panel 115b glued and stably connected thereto.

By way of a non-limiting example, the gluing, or adhesive, material M1 can be a heat-sealable material, for example a heat-activated glue.

In accordance with preferred embodiments, a first and a second larger side panel 116a, 117a are connected to the first main panel 111 on opposite sides with respect
10 to the axis of symmetry X, and a first and a second smaller side panel 116b, 117b are connected to the second main panel 112 on opposite sides with respect to the axis of symmetry X.

According to some embodiments, the first and second larger side panel 116a and 117a, when the planar blank 110 is folded, are configured to define the third
15 and fourth side wall 16, 17.

The first smaller side panel 116b, when the planar blank 110 is folded, is configured to be superimposed and stably joined, preferably with glue, to an end portion of the first larger side panel 116a, thus defining a third support foot 21.

The second smaller side panel 117b, when the planar blank 110 is folded, is
20 configured to be superimposed and stably joined, preferably with glue, to an end portion of the second larger side panel 117a, thus defining a fourth support foot 22.

According to other embodiments, not shown in the drawings, the third and fourth side wall 16, 17 are respectively defined by the partial superimposition and
25 stable joining, preferably with glue, of the first and second smaller side panel 116b, 117b with the first and second larger side panel 116a, 117a.

In general, the planar blank 110 is configured to be suitably folded and shaped, or divaricated, or opened, passing from a flattened configuration to an upright configuration.

30 Specifically, the first and second main panel 111, 112, which in this flattened configuration are partially superimposed and in contact with each other, are able to be reciprocally separated and spaced apart to put each other in parallel, thus forming the upper and lower transverse wall 11, 12, which are also perpendicular

at least to the first and second side wall 13, 15, already defined by the superimposition and stable joining with glue of the first and second smaller central panel 113b, 115b with the first and second larger central panel 113a, 115a, respectively.

5 In other words, the support tray 10 consists of an articulated parallelogram, or quadrilateral, comprising a frame, or mechanism, defined by the second side wall 15 with the second support foot 20, two cranks defined by the upper and lower transverse wall 11, 12, respectively, and a connecting rod defined by the first side wall 13 with the first support foot 19, wherein the passage from the flattened
10 configuration to the upright configuration is achieved through a rotation of the two cranks.

The method for making the support tray 10 described heretofore comprises the following steps.

Initially, an initial shaping step can be provided in which the planar blank 110
15 is suitably shaped to make the support tray 10.

For example, the planar blank 110 can be supplied with the first and second main panel 111, 112 already provided with the first holes 25 and diaphragms 24, respectively, as defined above. Alternatively, in the shaping step, the first holes 25 can be made on the first main panel 111 and the diaphragms 24 can be made on
20 the second main panel 112, depending on the possible embodiments.

In accordance with possible embodiments and/or operating variants, the method can comprise a first main folding step.

In this first main folding step, the planar blank 110 is initially folded so that the first smaller central panel 113b contacts and is superimposed with an end portion
25 of the first larger central panel 113a (fig. 6). Then, by means of the gluing material M1, the first smaller central panel 113b is glued and stably joined to the first larger central panel 113a, thus forming the first side wall 13.

Then, the planar blank 110 is folded so that the first and second main panel 111, 112 are arranged perpendicular to the first larger and smaller central panel 113a,
30 113b and parallel to each other so that the first holes 25 and the diaphragms 24 are axially aligned (fig. 7).

Thereafter, the planar blank 10 is folded so that the first side wall 13 folds inwards to contact and be superimposed with the first main panel 111,

consequently making obliquely translate both the second main panel 112, so that it contacts the first main panel 111, and also the second smaller central panel 115b, so that it contacts and is superimposed with an end portion of the second larger central panel 115a (fig. 8).

- 5 Then, by means of the gluing material M1, the second smaller central panel 115b is glued and stably joined to the second larger central panel 115a, thus forming the second side wall 15.

 We must clarify that, in relation to the type of gluing material M1, the gluing between the first larger and smaller central panel 113a, 113b and between the
10 second larger and smaller central panel 115a, 115b can be achieved in different ways. For example, in the event that the gluing material M1 is a heat-sealable material, the latter is suitably heated and, therefore, activated to guarantee that these central panels remain glued together.

 The planar blank 110 is thus in a flattened configuration (fig. 8), wherein the
15 first and second main panel 111, 112 are partially superimposed and in contact with each other, and the first and second smaller central panel 113b, 115b are joined and glued to the first and second larger central panel 113a, 115a.

 In accordance with possible embodiments and/or operating variants, the method can provide that the planar blank 110 is fed already in this flattened configuration,
20 in order to perform multiple folding operations thereon able to form a support tray 10.

 The method comprises a shaping, or divaricating, step in which, from the flattened configuration, the planar blank 110 is suitably shaped with an oblique translational movement, to make it assume a suitable three-dimensional shape, that
25 is, an upright configuration that determines the geometry of the support tray 10. In particular, the first and second main panel 111, 112, partially superimposed and in contact with each other, are separated from each other and spaced apart to put each other in parallel, thus forming the upper and lower transverse wall 11, 12 which, in this upright configuration, are perpendicular to the first and second side wall 13,
30 15. In this shaping step, the first holes 25 are aligned with the diaphragms 24 and the two support feet 19, 20 (fig. 9) are essentially formed which, in the flattened condition, are substantially horizontal and do not perform their function.

 In accordance with preferred embodiments, the method comprises a second

main folding step, or forming step, in which the larger and smaller side panels 116a, 116b and 117a, 117b of the planar blank 110 are folded to define the third and fourth side wall 16, 17, thus forming the support tray 10.

In this second main folding step, the first and second smaller side panel 116b, 117b are folded inwards, so that they are perpendicular to the lower transverse wall 12 and adjacent to the support feet 19, 20 (fig. 10).

Subsequently, another gluing material M2, possibly similar to the gluing material M1 (fig. 11), is applied on the first and second smaller side panel 116b, 117b, already folded. Alternatively, the gluing material M2 can be applied on an end portion of the first and second larger side panel 116a, 117a.

The first and second larger side panel 116a, 117a are then folded so that their end portion is superimposed with the already folded first and second smaller side panel 116b, 117b. Then, by means of the gluing material M2, the first and second smaller side panel 116b, 117b are glued to the first and second larger side panel 116a, 117a, defining respectively the third and fourth side walls 16, 17 and forming the other two support feet 21, 22 (fig. 12).

In this way, a support tray 10 is formed that is more stable and less subject to oscillations, deformations and/or flattening.

The method also comprises a preparation step, in which the support tray 10 is suitably prepared for insertion of the elongated products 200 through the first holes 25 of the upper transverse wall 11 and, depending on the embodiments, into the openings defined by the folded diaphragms 24 of the lower transverse wall 12 (figs. from 16 to 18).

In this preparation step, it is provided to actuate folding members 40 (figs. 13 and 16), for example with a cylindrical or frustoconical shape, in number equal to the first holes 25 and having dimensions such that it is possible to pass through them freely. Specifically, the folding members 40 have a perimeter diameter DP that is smaller than the first diameter D1 of the first holes 25.

In particular, the preparation step comprises a folding step, in which the folding members 40 (fig. 16) are axially aligned with the first holes 25 and then actuated, passing through the first holes 25, until engaging and folding the diaphragms 24 to define corresponding through openings, which are axially aligned with the first holes 25, in which to insert the elongated products 200.

According to possible embodiments, folding of the diaphragms 24 comprises folding the corresponding foldable flaps 30 (fig. 2a) so as to create respective central through openings that allow the insertion of the elongated products 200.

5 According to preferred embodiments, folding of the diaphragms 24 comprises elastically folding the foldable flaps 28 of the second holes 26 (fig. 17) so as to adequately enlarge the latter, thus forming the enlarged holes 29 with a third diameter D3 for insertion of the elongated products 200 (figs. 14 and 18).

10 In this folding step, actuation of contrast members 41 (fig. 17) can also be advantageously provided, which contrast and control the action of the folding members 40, supporting the lower transverse wall 12 at the diaphragms 24, so that the latter are folded correctly without the risk of damaging the lower transverse wall 12 itself.

This is particularly useful and advantageous in the case of flexible or deformable elongated products 200, such as smoking articles or suchlike.

15 Then, in a subsequent insertion step, the elongated products 200 are inserted into the support tray 10 passing through corresponding first holes 25 until engaging, with the respective lower end 201, the through openings formed by folding the diaphragms 24, in which each elongated product 200 is supported, or sustained, by interference, by the foldable flaps 30 or by the flaps 28, suitably
20 folded.

The method can comprise a packaging step, in which the support tray 10 is suitably inserted inside the containing body 101 to form a box-shaped package 100 (fig. 15).

25 It is clear that modifications and/or additions of parts or steps may be made to the method and to the support tray 10 as described heretofore, without thereby departing from the field and scope of the present invention, as defined by the claims.

For example, according to some embodiments, in the event the support tray 10 comprises only two side walls 13, 15, once the shaping step has been carried out,
30 the method comprises the preparation step, the insertion step and finally the packaging step.

It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art will be able to

achieve other equivalent forms of methods for making support trays and corresponding support trays having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

- 5 In the following claims, the sole purpose of the references in brackets is to facilitate their reading and they must not be considered as restrictive factors with regard to the field of protection defined by the claims.

CLAIMS

1. Method for making a support tray (10) for elongated products (200), in particular smoking articles, said method comprising providing a support tray (10) having an upper transverse wall (11) and a parallel lower transverse wall (12) facing each other and provided with a plurality of first holes (25) for positioning said elongated products (200) and a plurality of foldable diaphragms (24), respectively distributed on the upper (11) and lower (12) transverse walls of said support tray (10), said method being **characterized by** folding said foldable diaphragms (24) by means of folding members (40) which are first axially aligned with said first holes (25) above said upper transverse wall (11) and then actuated to pass through said first holes (25) until the folding members (40) engage and fold said diaphragms (24) so as to define, on the lower transverse wall (12), through openings axially aligned with said first holes (25), through which said elongated products (200) can be easily inserted after removing the folding members (40).
2. Method as in claim 1, **characterized in that** during folding of said diaphragms (24), contrast members (41) are provided which support said lower transverse wall (12) to prevent damages of the lower (12) transverse wall of said support tray (10).
3. Method as in claim 2, **characterized in that** said contrast members (41) comprise annular rigid portions which encircle the folding members (40) during folding of said diaphragms (24).
4. Method as in any one of claims 1 to 3, **characterized in that** the folding of said diaphragms (24) comprises folding a plurality of contiguous foldable flaps (28; 30).
5. Method as in claim 4, **characterized in that** said foldable flaps (28; 30) are defined by radial incisions (31) and hingedly arranged around an annular profile.
6. Method as in claim 4 or 5, **characterized in that** the foldable flaps (28) circumferentially delimit corresponding second holes (26) axially aligned with said first holes (25), each first hole (25) having a first diameter (D1) greater than a second diameter of each of said second holes (26), **and in that** folding said foldable flaps (28) enlarges the second holes (26) forming enlarged holes (29) having a third diameter (D3) greater than said second diameter (D2).
7. Method as in any one of claims 1 to 6, **characterized by** comprising, after folding said diaphragms (24) and removing the folding members (40), a step of

inserting said elongated products (200) into said support tray (10), wherein the elongated products (200) are inserted through said first holes (25) until engaging, with a respective lower end (201), said through openings obtained by folding said diaphragms (24), said elongated products (200) having of a frustoconical shape.

5 8. Method as in any one of claims 1 to 7, **characterized in that** said support tray (10) is obtained from a single planar blank (110) comprising: a first main panel (111) provided with said plurality of first holes (25); a second main panel (112) aligned with said first main panel (111) and provided with said plurality of foldable diaphragms (24); a first (113a) and a second (115a) larger central panel connected,
10 on opposite sides, to said first main panel (111); a first (113b) and a second (115b) smaller central panel connected, on opposite sides, to said second main panel (112), said first larger central panel (113a) being contiguously adjacent to said first smaller central panel (113b), wherein said first (113b) and second (115b) smaller central panels are superimposed and joined with glue respectively to a lower end
15 portion of said first (113a) and second (115a) larger central panel, thus forming respectively a first (13) and a second (15) side wall opposite each other, perpendicular to said upper (11) and lower (12) transverse wall, and extending from said upper (11) transverse wall beyond said lower transverse wall (12) so as to define respective support legs (19, 20).

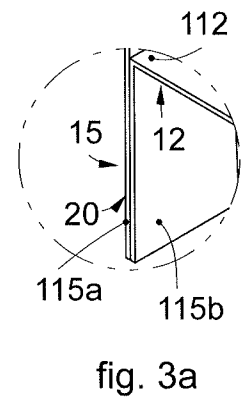
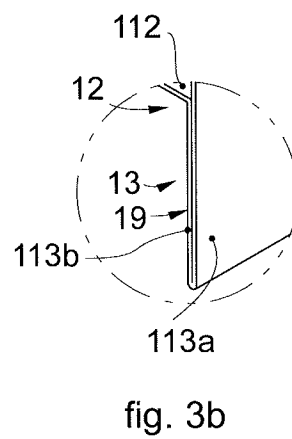
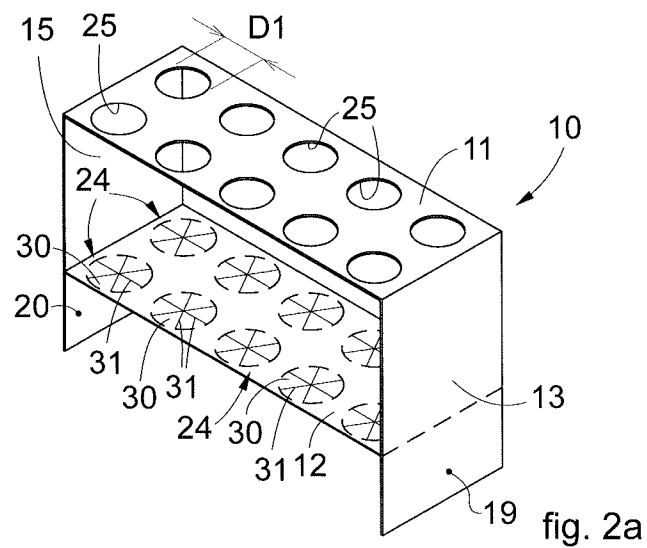
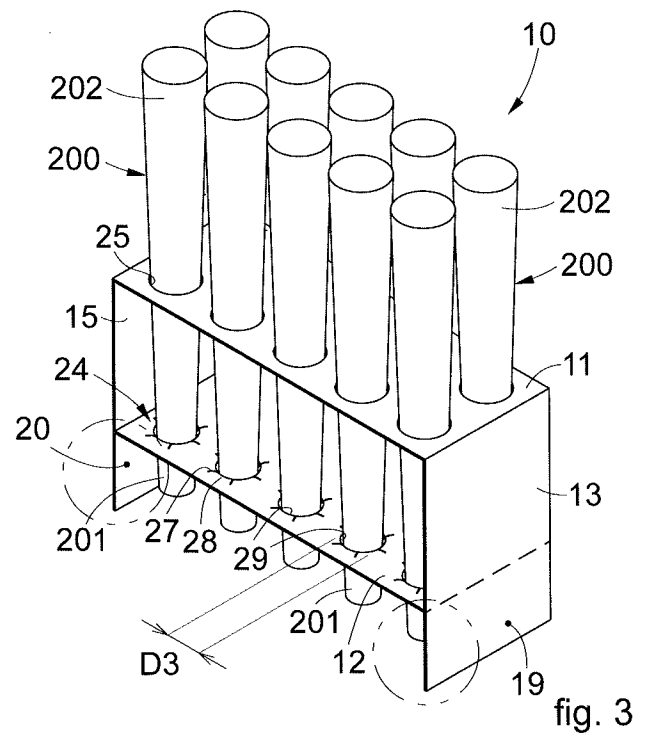
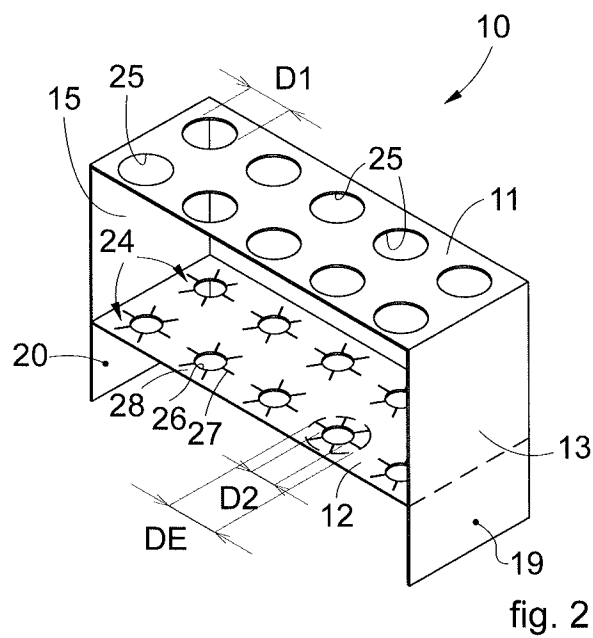
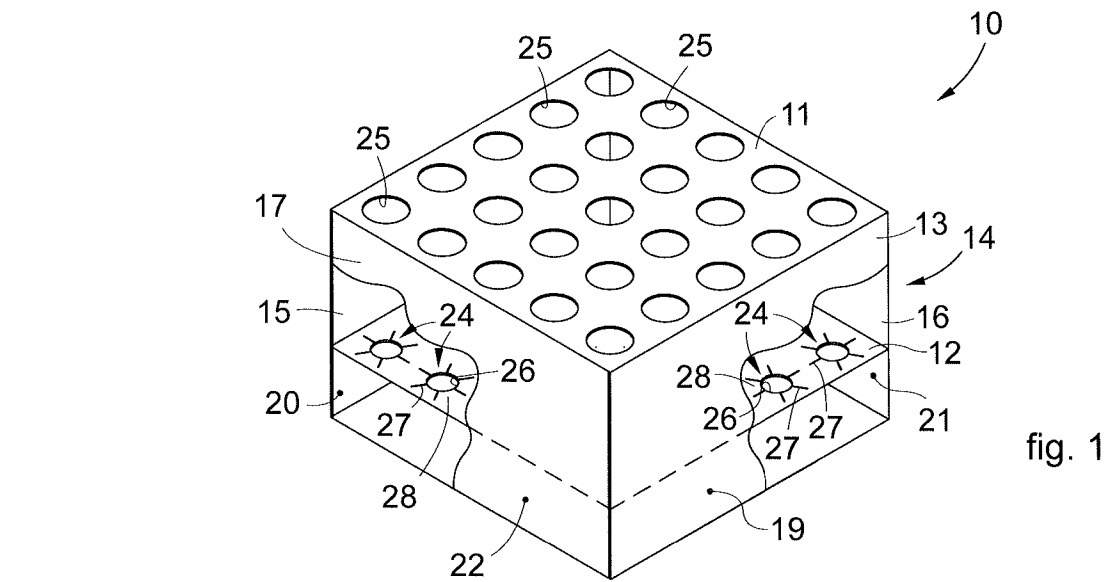
20 9. Method as in claim 8, **characterized by** comprising a shaping step, in which said planar blank (110) starting from a flattened configuration is shaped in a three-dimensional upright configuration, **and in that** in said shaping step, the first (111) and the second (112) main panel of said planar blank (110), firstly are partially superimposed and in contact with each other, then are separated from each other
25 and spaced apart to put each other in parallel, thus forming said upper (11) and lower (12) transverse wall perpendicular to said first (13) and second (15) side walls, in said upright configuration.

10. Method as in claim 9, **characterized by** comprising further folding steps, after said shaping step, in which a first (116b) and a second (117b) smaller side
30 panel connected, on opposite sides, to said second main panel (112) of said planar blank (110) are folded towards said respective support legs (19, 20), and in which a first (116a) and a second (117a) larger side panel connected, on opposite sides, to said first main panel (111) of said planar blank (110) are folded so that a

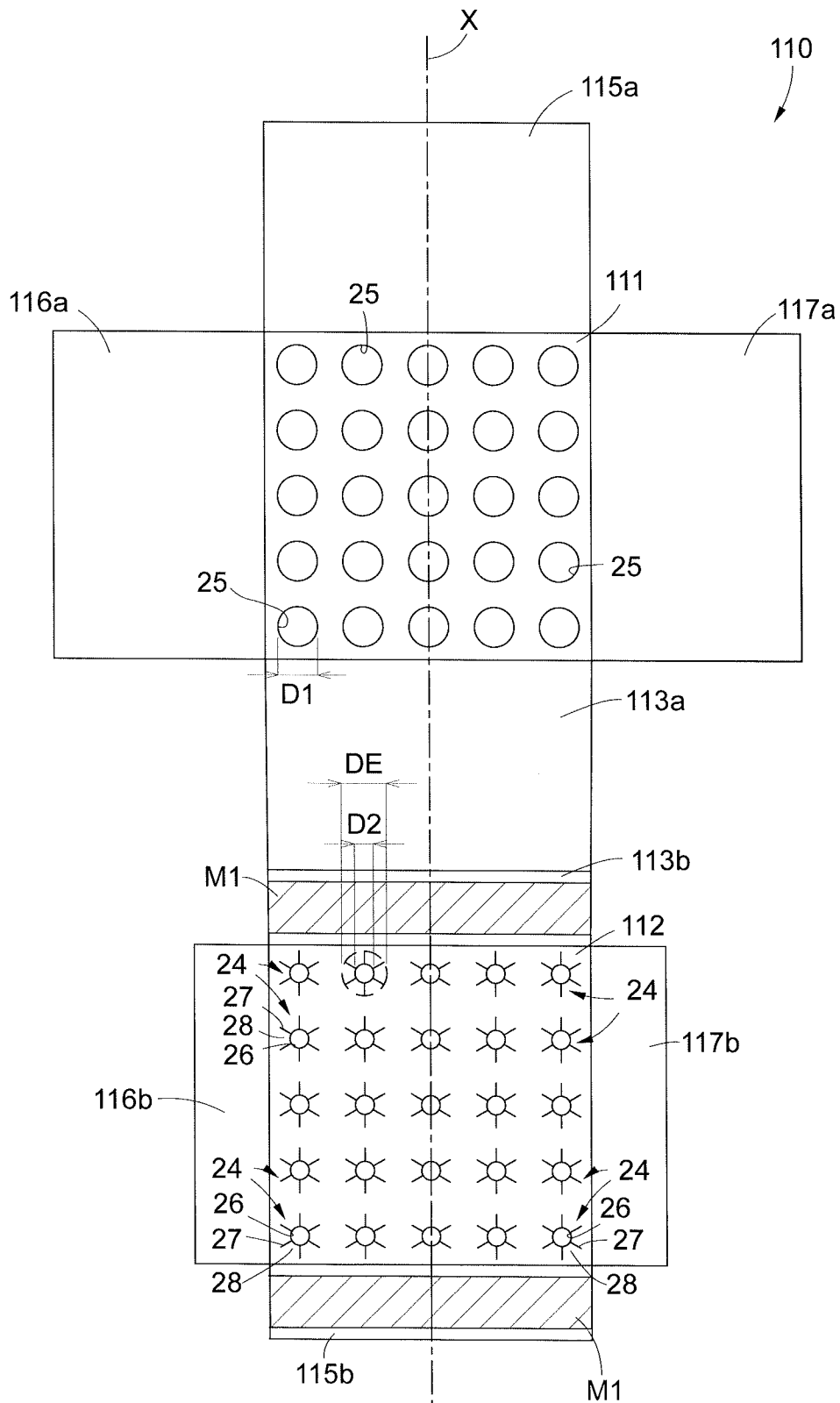
respective lower end portion thereof is superimposed and joined with glue to said first (116b) and second (117b) smaller side panel, respectively, thus forming respectively a third (16) and a fourth (17) side wall of said support tray (10) and defining further respective support legs (21, 22).

- 5 11. Method as in any one of the claims hereinbefore, **characterized in that** each of said folding member (40) protrudes from a movable common support so as to fold said plurality of diaphragms (24) in a single step when moving said movable common support.
- 10 12. Method as in any one of the claims hereinbefore, **characterized in that** each of said folding members (40) has an elongated substantially cylindrical shape and is dimensioned to freely pass through the first holes (25).
13. Method as in any one of the claims hereinbefore, **characterized in that** each of said folding members (40) has an end portion with a frustoconical shape.
- 15 14. Method as in any one of the claims hereinbefore, **characterized in that** said elongated products (200) have a frustoconical shape and are made of flexible or deformable material.

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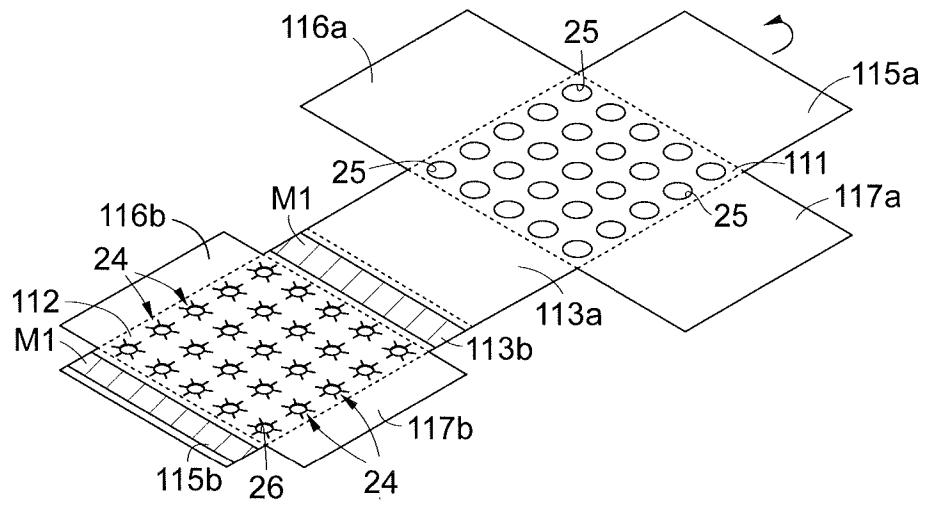


fig. 5

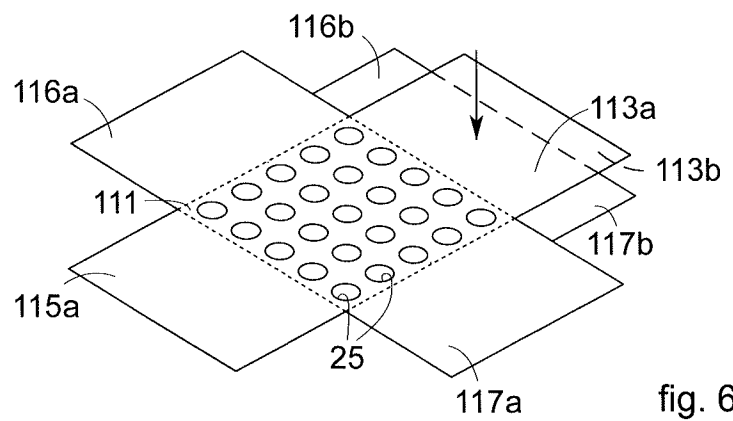


fig. 6

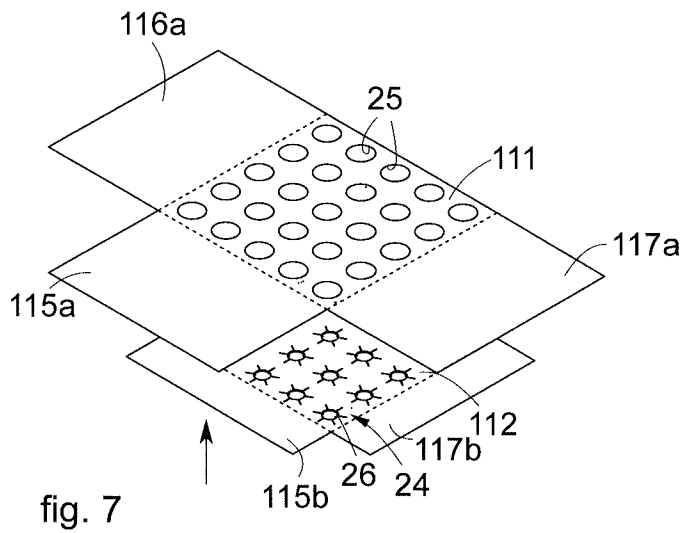


fig. 7

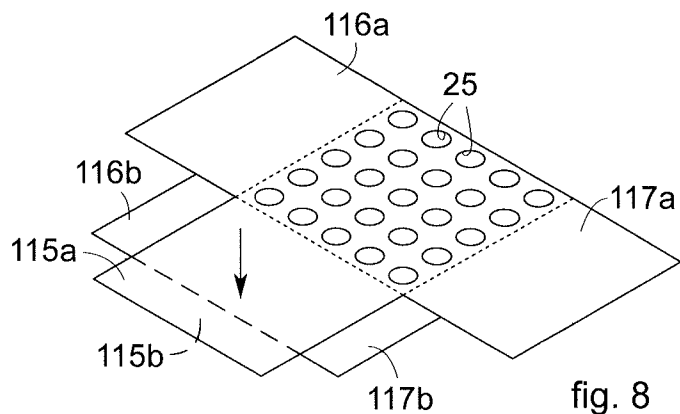
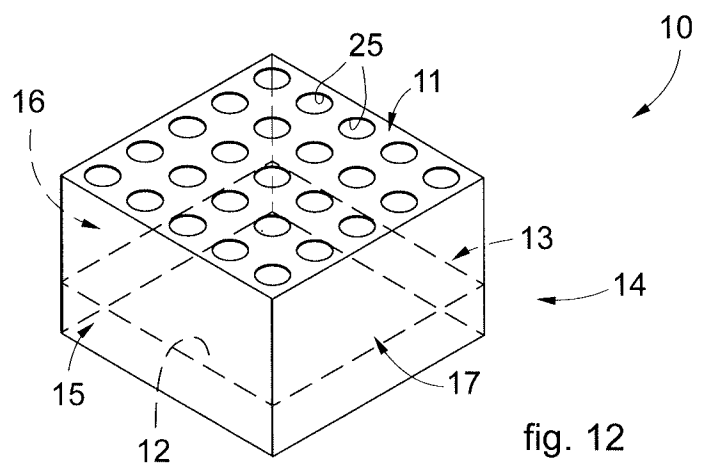
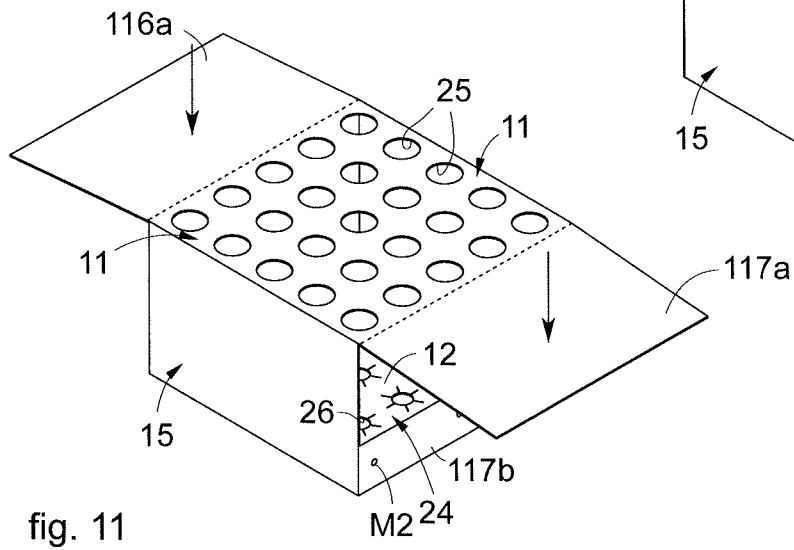
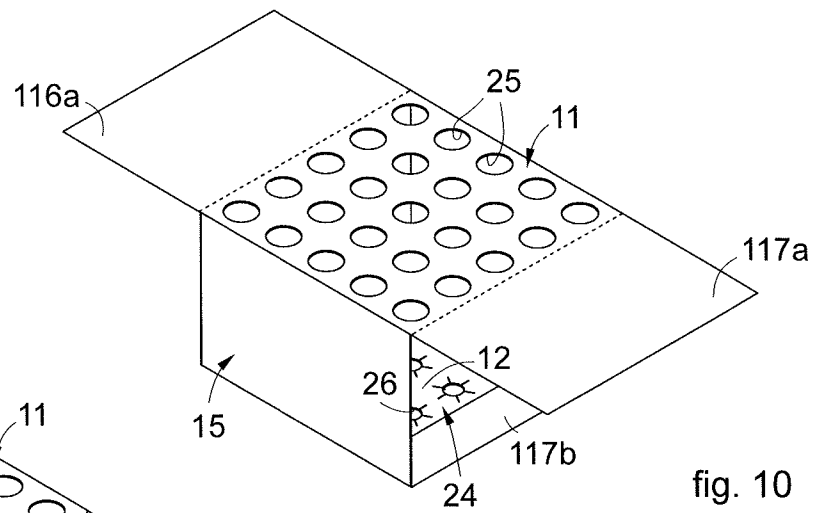
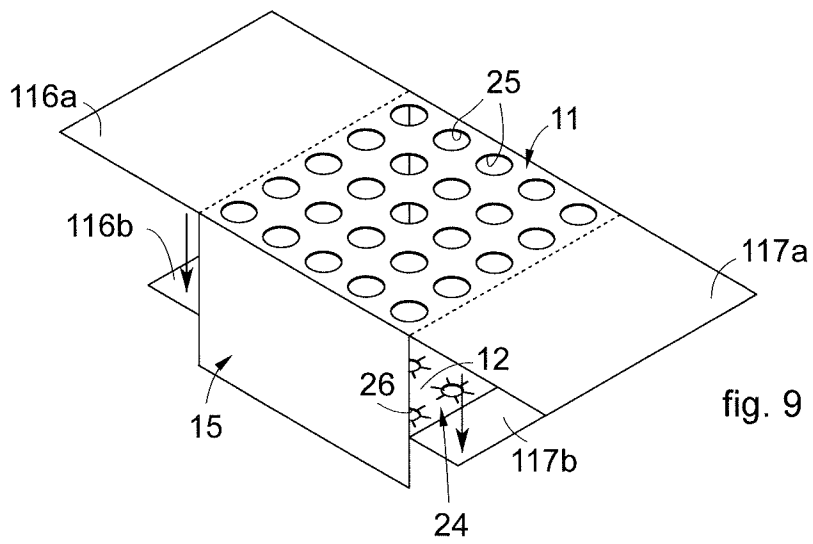


fig. 8

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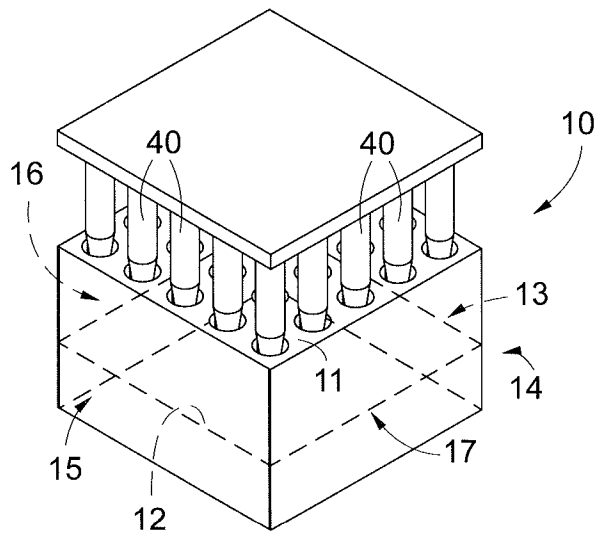


fig. 13

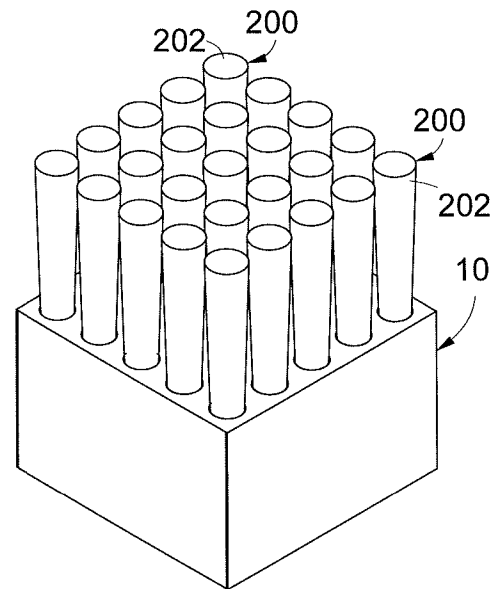


fig. 14

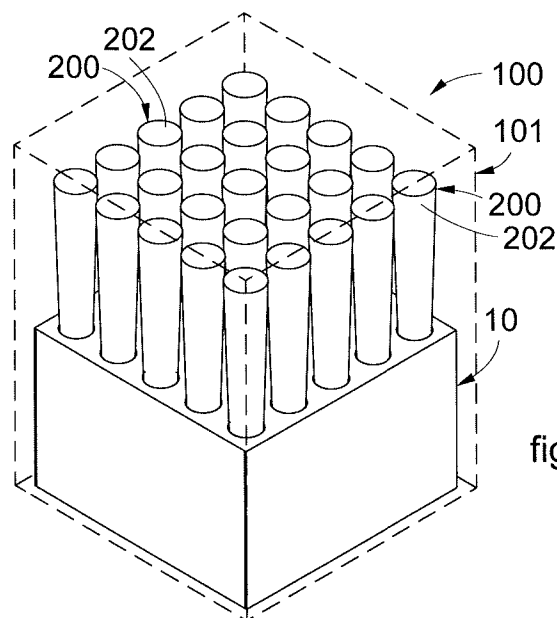


fig. 15

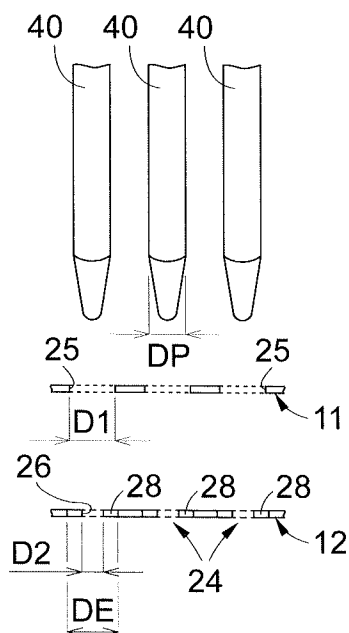


fig. 16

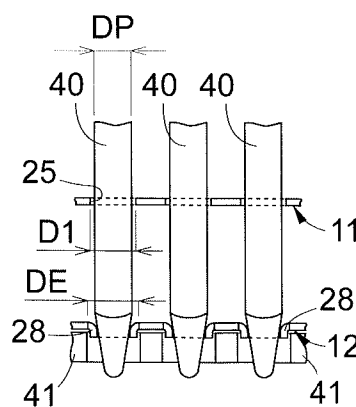


fig. 17

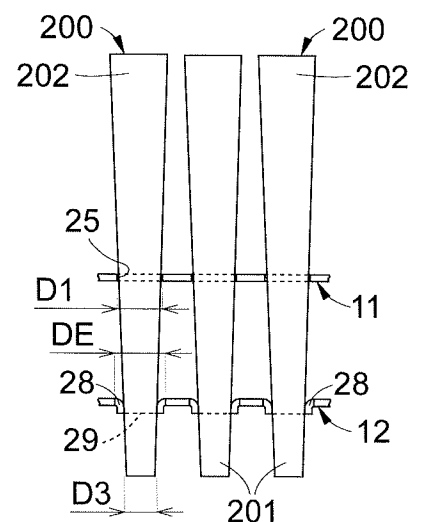


fig. 18

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2024/050134

A. CLASSIFICATION OF SUBJECT MATTER INV. B65D5/50 B65D71/72 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7 028 839 B2 (CURTI COSTRUZIONI SPA [IT]) 18 April 2006 (2006-04-18)	1,4-10, 12-14
A	column 5, lines 58-67; figures 1,3,4 -----	2,3,11
A	US 5 725 109 A (MOULTON TOM [US] ET AL) 10 March 1998 (1998-03-10) figure 1 -----	1-14
A	US 11 420 786 B1 (ANSOLA III MAXIMO [US]) 23 August 2022 (2022-08-23) the whole document -----	1-14
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 4 October 2024		Date of mailing of the international search report 14/10/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Wimmer, Martin

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IT2024/050134

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