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(54) Title: FILLING INSERT FOR A PACKET OF SMOKING ARTICLES, COMBINATION WITH A DRAWER, APPARATUS, MACHINE, BLANK, PACKET AND METHODS ASSOCIATED

(57) Abstract: Filling insert for a packet (20) of smoking articles (13) organized in one or more groups (12), comprising a filling body (14) and stabilization members (16) defined by appendixes protruding toward the outside from the lateral surface of said filling body (14).

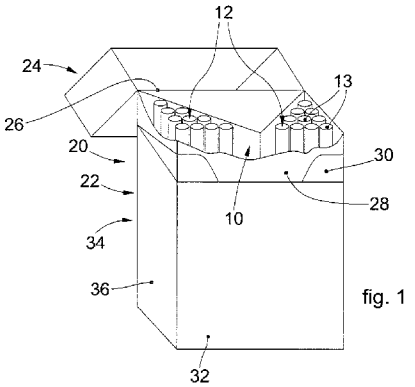

fig. 1

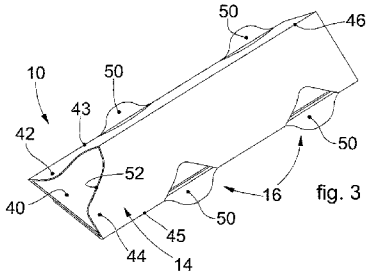

fig. 3

WO 2017/216160 A1

FILLING INSERT FOR A PACKET OF SMOKING ARTICLES, COMBINATION WITH A DRAWER, APPARATUS, MACHINE, BLANK, PACKET AND METHODS ASSOCIATED

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FIELD OF THE INVENTION

Embodiments described here concern a filling insert for a packet of smoking articles and the corresponding blank.

In particular, embodiments described here concern a filling insert which can be used inside an assembly or bundle formed by organized groups of smoking articles wrapped in a wrapping sheet such as for example cigarettes, cigars, cigarillos, or suchlike, for making packets of smoking articles.

Embodiments described here also concern an apparatus and a method for forming the filling insert in question.

BACKGROUND OF THE INVENTION

It is known that, as a result of regulations or legislation in the field of smoking articles, the free surface available in the design or sizing of the packets can, or will be able in the future to, be greatly reduced depending on the country. In particular, it is conceivable that in the future packets of smoking articles will have only certain predefined sizes, so that adapting the size of the packet to the actual size and the number of smoking articles contained therein could become difficult if not impossible.

For example, in the case of smoking articles with a reduced diameter, such as so-called "slim" cigarettes, or if it is desired to contain fewer smoking articles while maintaining the pre-determined size of the packet, it can become necessary to adapt the internal volume of the packets to prevent the smoking articles, either because of their smaller diameter, or because they are fewer in number, from moving freely inside the bundle in an unwanted manner, with the risk of being damaged.

To this purpose, one approach can be to provide, in the assembly or bundle formed by organized groups of smoking articles already wrapped in a wrapping sheet, filling elements or inserts that compensate and fill the empty spaces caused by different sizes or quantities of smoking articles compared to the pre-determined volume of the packet. In essence, the filling elements or inserts will

define one or more dedicated compartments in the bundle, with a volume coherent with the volume occupied by the smoking articles which will actually be provided in the bundle itself, thus preventing the smoking articles from being free to move in an unwanted manner.

If the group of smoking articles could move inside the packet, or inside a forming drawer of organized groups of smoking articles, during the steps of packaging the packet, or during subsequent storage and distribution steps, the smoking articles could be subjected to mechanical stresses that could cause damage to them. In particular, the relative movements of the smoking articles could cause knocks especially in the ends opposite the filters, risking making the tobacco escape or in any case damaging the shape of the smoking article.

In the field of packing machines, apparatuses are known for the formation of organized groups of smoking articles comprising feed devices configured to insert, by means of a thrust assembly, one or more organized groups of smoking articles in forming drawers, or pockets, provided in suitable housing devices.

In this context, there are various solutions to insert, inside the forming drawer, said filling elements or inserts before the transfer of the organized group of smoking articles inside the forming drawer itself.

Known solutions have the disadvantage that forming the group of smoking articles together with the insert can be complex, since both the smoking articles and the inserts must be maintained in the correct reciprocal positions until both are wrapped by the wrapping sheet.

Document DE-A-102015014182 describes an insert for a cigarette packet, able to divide, inside the latter, the cigarettes into two groups. The insert has a central body with a parallelepiped shape and a triangular base consisting of an upper base and two sides that converge, but do not touch. From the convergence zone of the two sides, L-shaped elements depart laterally, each formed by two consecutive right-angled walls. This document also describes a method to combine the insert in the forming drawer of the groups of cigarettes.

Document WO-A-2016/083442 describes a first variant of a hollow parallelepiped shaped spacer, with a triangular base and a lid provided with lateral flaps. A second variant described provides that the spacer consists of a triangular hollow body formed by only two walls and the lid, while the walls

project laterally and symmetrically, defining protruding fins that are able to lie adjacent to the walls of the packet.

Document DE-A-102014116784 describes a method and apparatus to produce cigarette packets, in which there is a housing drawer with separate chambers, into which an insert and smoking articles are respectively introduced. The insert is provided, on the lateral walls, with stiffening fins protruding toward the inside of the insert. The housing drawer comprises, in particular, recesses provided with at least one passage aperture through which to insert at least the smoking articles. This prior art document also describes walls, present in the housing drawer, able to separate the insert from the smoking articles inserted in the recesses.

Document EP-A-2.982.607 describes an insert and a drawer with stabilizing guides for the insert, protruding toward the inside of the drawer.

Document EP-A-3.025.979 describes a packet with a double internal spacer.

There is therefore a need to perfect a filling insert for a packet of smoking articles and corresponding blank, apparatus and method for forming said insert, which can overcome at least one of the disadvantages of the state of the art.

In particular, one purpose of the present invention is to obtain a filling insert for smoking articles which can maintain its position with respect to the smoking articles both during the formation of the packet and also during the use of said packet.

Another purpose of the present invention is to provide a filling insert that is simple and economical to make.

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.

Other limitations and disadvantages of conventional solutions and technologies will be clear to a person of skill after reading the remaining part of the present description with reference to the drawings and the description of the embodiments that follow, although it is clear that the description of the state of the art connected to the present description must not be considered an admission that what is described here is already known from the state of the prior art.

SUMMARY OF THE INVENTION

The present invention is set forth and characterized in the independent claims,

while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

In accordance with the above purposes, a filling insert is provided for a packet of smoking articles organized in one or more groups. In particular, for a packet comprising an internal assembly comprising one or more organized groups of smoking articles and at least one filling insert, wrapped in a wrapping sheet.

Examples of smoking articles can be, for example, cigarettes, cigars, cigarillos or suchlike.

According to one aspect of the present invention, the filling insert comprises a filling body and stabilization members defined by appendixes protruding toward the outside from the lateral surface of the filling body.

In accordance with some embodiments, the filling insert has a shape and sizes suitable to be inserted into a containing compartment of a drawer for forming organized groups of smoking articles, wherein the transverse length of the stabilization members is correlated to the transverse size of the containing compartment in order to prevent transverse movements of the filling insert inside the containing compartment.

Moreover, the stabilization members can be configured to guarantee the positioning and the maintenance of the position by the filling insert even inside a packet of smoking articles.

In particular, the stabilization members allow the filling insert to stay stationary inside the packet even during use, and therefore during the progressive decrease in the number of the smoking articles, without the possibility of damaging the remaining smoking articles by knocking against them.

According to some embodiments, the filling body has a prismatic shape with a lateral surface defined by a base first lateral face and at least two lateral faces.

According to some embodiments, the stabilization members protrude from an edge defined by two of the adjacent lateral faces.

According to some embodiments the stabilization members comprise at least a fin that extends laterally from one joint edge between two consecutive sides.

According to possible embodiments, the stabilization members extend in opposite symmetrical directions continuously with a base first lateral face of the filling body. Advantageously, in this way, it is possible to define a robust filling

insert, with stabilization members and base walls that can therefore lie essentially on a whole lateral of the cigarette packet.

According to possible embodiments, the filling insert can have a prismatic shape with a triangular section shape, comprising the first lateral face that functions as a base and a second and a third lateral face that function as sides. According to these embodiments, it can be provided that the stabilization members extend in opposite symmetrical directions continuously with the first lateral face.

According to variant embodiments, the filling body can have a box-like shape, that is, it can be empty inside.

According to possible preferred embodiments, the filling body can be made as a solid body.

The present invention also concerns a forming apparatus of a filling insert for a packet of smoking articles, which comprises:

- means to supply a flat blank, which has two external longitudinal folding lines which define respective external longitudinal panels and at least a main central panel, wherein the main central panel comprises at least an intermediate longitudinal folding line that defines intermediate longitudinal panels and wherein at least one of the longitudinal folding lines comprises pre-creasing segments separated by cutting lines that define cut out portions, wherein the cutting lines are made on the main central panel; and
- a shaping unit configured to shape the flat blank and form a filling insert.

According to some embodiments, the shaping unit comprises:

- a thruster device, able to act, on one lateral of the blank, at least on the intermediate folding line, to define the intermediate longitudinal panels;
- a contrast device, or counter-thruster, cooperating with the thruster device and configured to act on the opposite lateral of the blank with respect to the thruster device;
- a folding device configured to fold the external longitudinal panels, overlapping them one over the other to close the blank and define a filling body of the filling insert; and
- thrust members, configured to act on the cut out sections to make stabilization members of the filling insert defined by appendixes protruding toward the outside

from the external lateral surface of the filling body.

According to possible embodiments, the stabilization members extend in opposite symmetrical directions continuously with a base first lateral face of the filling body.

According to some embodiments, the means to supply a blank comprising an incision and cutting unit provided with:

- an incision device configured to make, on a flat sheet of paperboard, paper or cardboard, the external longitudinal folding lines and the at least one intermediate longitudinal folding line, wherein at least one of the longitudinal folding lines comprises pre-creasing segments separated by cutting lines that define cut out portions; and
- a cutting device, configured to cut the flat sheet in a direction transverse to a direction of feed of the flat sheet, at least to cut the blank to size.

Embodiments described here also concern a method to form a filling insert for a packet of smoking articles. The method comprises:

- a step of feeding a flat blank that has two external longitudinal folding lines which define respective external longitudinal panels and at least a main central panel, wherein the main central panel comprises at least an intermediate longitudinal folding line which defines intermediate longitudinal panels and wherein at least one of the longitudinal folding lines comprises pre-creasing segments separated by cutting lines that define cut out portions, wherein the cutting lines are made on the main central panel;
- a step of shaping the blank to form a filling insert according to the present description, during which the main central panel is folded along the at least one intermediate longitudinal folding line to define the intermediate panels and of inclining them with respect to each other as a function of the shape of the section of a filling body of the filling insert;
- a closing step, during which the external longitudinal panels are folded along the respective external longitudinal folding lines, and are positioned one on top of the other to define the filling body.

According to one aspect of the invention, during the shaping and/or closing step, in correspondence with the cutting lines, the method provides to determine the formation of stabilization members of the filling insert, defined by appendixes

protruding toward the outside from the lateral external surface of the filling body.

According to possible embodiments, the stabilization members extend in opposite symmetrical directions continuously with a base first lateral face of the filling body.

Other embodiments of the present invention also concern a machine to form organized groups of smoking articles comprising:

- a feed unit, configured to receive a stream of smoking articles to be arranged in organized groups;
- a transfer unit of the organized groups of smoking articles provided with a plurality of forming drawers and able to move the drawers step-wise along a transfer path between an entrance station of the smoking articles and an exit station of the organized groups;
- an introduction unit configured to introduce the organized groups of smoking articles in the drawers in correspondence with the entrance station of smoking articles.

According to one aspect of the present invention, the machine comprises an apparatus to form a filling insert according to the present description and a thruster device, configured to translate the filling insert from the shaping unit to a drawer in correspondence with an entrance station of the inserts located upstream of the entrance station of the smoking articles along the transfer path.

Other embodiments concern a method to form organized groups of smoking articles that provides to:

- supply a stream of smoking articles in a feed unit;
- obtain organized groups of smoking articles from the feed unit;
- selectively introduce one or more of the organized groups of smoking articles into a containing compartment of a drawer of a transfer unit when the drawer is in an entrance station of the smoking articles along a transfer path.

According to one embodiment, before the introduction of the organized group of smoking articles, the method comprises:

- incising and/or cutting a blank starting from a flat sheet of paperboard, paper or cardboard;
- shaping the blank and folding it to form a filling insert comprising a filling body and stabilization members defined by appendixes protruding toward the outside

from the external lateral surface of the filling body;

- inserting the filling insert into the containing compartment of the drawer in correspondence with an entrance station of the inserts located upstream of the entrance station of the smoking articles along the transfer path, positioning the filling insert in a stable manner in the containing compartment by means of the stabilization members;

- moving the drawer containing the filling insert into the entrance station of the smoking articles.

According to possible embodiments, the stabilization members extend in opposite symmetrical directions continuously with a base first lateral face of the filling body.

Embodiments described here also concern a packet of smoking articles comprising a rigid external containing casing and an upper lid hinged to the external containing casing by means of a hinge. The packet, in the closed condition of the lid, has a parallelepiped rectangular shape, delimited laterally by two larger lateral walls, front and rear, parallel and opposite to each other, and by two smaller lateral walls, also parallel and opposite to each other, wherein the external containing casing contains inside it an internal assembly comprising one or more organized groups of smoking articles and at least a filling insert, wrapped by a wrapping sheet, possibly partly enclosed by an internal casing. In an embodiment the filling insert comprises a filling body and stabilization members defined by appendixes protruding toward the outside from the external lateral surface of the filling body. The filling insert has shape and sizes suitable to be inserted into the external containing casing, wherein the transverse length of the stabilization members is correlated to the transverse size of a compartment defined by the larger and smaller lateral walls to prevent transverse movements of the filling insert inside the compartment.

According to possible embodiments, the stabilization members extend in opposite symmetrical directions continuously with a first base lateral face of the filling body.

Other embodiments concern a blank to make a filling insert. In an embodiment, the blank comprises two external longitudinal folding lines that define respective external longitudinal panels and at least a main central panel,

wherein the main central panel comprises at least an intermediate longitudinal folding line that defines intermediate longitudinal panels and wherein at least one of the longitudinal folding lines comprises pre-creasing segments separated by cutting lines that define cut out portions, wherein the cutting lines are made on the main central panel.

These and other aspects, characteristics and advantages of the present disclosure will be better understood with reference to the following description, drawings and attached claims. The drawings, which are integrated and form part of the present description, show some forms of embodiment of the present invention, and together with the description, are intended to describe the principles of the disclosure.

The various aspects and characteristics described in the present description can be applied individually where possible. These individual aspects, for example aspects and characteristics described in the specification or in the attached dependent claims, can be the object of divisional applications.

It is understood that any aspect or characteristic that is discovered, during the patenting process, to be already known, shall not be claimed and shall be the object of a disclaimer.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other characteristics 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:

- fig. 1 is a perspective view of a packet for smoking articles comprising an insert in accordance with embodiments described here;
- fig. 2 is a section view of a wrapping sheet containing a filling insert in accordance with embodiments described here and organized groups of smoking articles;
- fig. 3 is a perspective view of an insert in accordance with embodiments described here;
- fig. 4 is a plan view of a blank in accordance with embodiments described here suitable to make an insert as in fig. 3;
- fig. 5 is a partial perspective view of a forming apparatus of an insert in accordance with embodiments described here;

- figs. 6-11 show production steps of an insert in accordance with embodiments described here;

- fig. 12 is a schematic front view, partly in section, of a machine for packaging organized groups of smoking articles in accordance with embodiments described here;

- fig. 13 is a schematic lateral view of the machine for packaging organized groups of smoking articles in fig. 12;

- figs. 14-17 show possible variant embodiments of a filling insert in accordance with embodiments described here.

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 conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

We shall now refer in detail to the various embodiments of the present invention, of which one or more examples are shown in the attached drawings. Each example is supplied by way of illustration of the invention and shall not be understood as a limitation thereof. For example, the characteristics shown or described insomuch as they are part of one embodiment can be adopted on, or in association with, other embodiments to produce another embodiment. It is understood that the present invention shall include all such modifications and variants.

Before describing these embodiments, we must also clarify that the present description is not limited in its application to details of the construction and disposition of the components as described in the following description using the attached drawings. The present description can provide other embodiments and can be obtained or executed in various other ways. We must also clarify that the phraseology and terminology used here is for the purposes of description only, and cannot be considered as limitative.

Forms of embodiment described here using figs. 1-4 concern a filling insert 10 for a packet 20 of smoking articles 13 organized into one or more groups 12. In particular, the packet 20 can be the type that comprises internally an internal assembly or bundle, comprising one or more organized groups 12 of smoking

articles 13 and at least one filling insert 10 wrapped in a wrapping sheet 28.

Fig. 1 is used to describe an example of a rigid packet 20 with a hinged lid that comprises a cup-shaped rigid external containing casing 22 and an upper lid 24 hinged to the external containing casing 22 by a hinge 26 (see fig. 1). The external containing casing 22 can contain inside it an internal assembly 11 or bundle, comprising one or more organized groups 12 of smoking articles 13 and at least one filling insert 10 wrapped by a wrapping sheet 28, for example aluminum, metallized paper, foil, which in turn can be partly enclosed by a collar 30 which can slide toward the outside to be partly extractable from the external containing casing 22.

When the lid 24 is closed, the packet 20 has a rectangular parallelepiped shape, delimited laterally by two larger lateral walls, front 32 and rear 34, parallel to each other and opposite, and by two smaller lateral walls 36, also parallel and opposite.

According to some embodiments, the filling insert 10 comprises a filling body 14 and stabilization members 16 defined by appendixes protruding toward the outside from the lateral surface of the filling body 14.

In possible embodiments, the stabilization members 16 extend in opposite symmetrical directions in continuity with a first face, or lateral base wall 40 of the filling body 14. Advantageously, in this way, it is possible to define a strong filling insert 10, with stabilization members 16 and lateral base face 40 which can therefore lie essentially on an entire side of the cigarette packet.

In possible solutions, advantageously the filling body 14 can be essentially similar to a prism with a polygonal base or cross section, for example with three sides, four sides, five sides, six sides, seven sides, eight sides or even more than eight sides. The first base lateral face 40 is, therefore, a base lateral face that defines one side of said prism with the polygonal base.

In particular, the filling insert 10 is able to be inserted into a containing compartment 129 of a drawer 128 for the formation of organized groups 12 of smoking articles 13.

In some embodiments, the filling insert 10 can have the shape and sizes suitable to be inserted into the containing compartment 129. In particular, the transverse length of the stabilization members 16 can be correlated to the

transverse size of the containing compartment 129 to prevent transverse movements of the filling insert 10 inside the containing compartment 129.

According to some embodiments, the transverse length of the stabilization members 16 protruding from the filling body 14 is correlated to the transverse size of the containing compartment 129, so that the stabilization members 16 cooperate with the containing compartment 129 to stabilize the filling insert 10 therein.

According to some embodiments, described for example with reference to figs. 2 and 14-16, the filling body 14 has a prismatic shape, having a lateral surface defined by at least two lateral faces.

According to possible variant embodiments described for example with reference to fig. 17, the filling body 14 can have a round or oval section.

According to further possible variants, the filling body 14 can have a trapezoidal section, or a rhomboidal, pentagonal, hexagonal, or other polygonal section.

According to some embodiments, the filling body 14 can have a regular or irregular polygon section.

According to some embodiments, the filling insert 10 can have a plurality of consecutive lateral faces two by two, suitable to be positioned at least partly in interference with the lateral walls of the containing compartment 129 and/or the walls 32, 34, 36 of a packet 20.

According to some embodiments, the lateral faces of the filling body 14 can be flat, or can be concave, or convex.

According to other embodiments, the edges defined by consecutive lateral faces can be sharp edged or rounded.

According to preferred embodiments, described for example with reference to fig. 3, the filling body 14 can have a prismatic shape with a triangular section, defined by three lateral faces 40, 42, 44, one of which is the first lateral face 40 serving as a base, a second face, or lateral wall 42 and a third face, or lateral wall 44, which function as sides.

According to possible solutions, the second lateral face 42 and the third lateral face 44 are joined to each other along a vertex edge 46 and to the first lateral face 40 along respective lateral edges 43, 45.

According to some embodiments, the stabilization members 16 protrude from an edge 43, 45, 46 defined by two adjacent lateral faces 40, 42, 44 of the lateral surface of the filling body 14.

According to some embodiments, the stabilization members 16 comprise at least one fin 50, or a claw.

According to possible solutions, described with reference to fig. 3, a pair of fins 50 are provided extending in a symmetrical position from each lateral edge 43, 45 defined by the first base lateral face 40 and by a respective one of either the second lateral face 42 or the third lateral face 44.

According to possible solutions, the fins 50 extend in continuity with the first base lateral face 40.

According to possible solutions, two or more pairs of fins 50 can be provided, distanced along the longitudinal extension of the filling insert 10 to clamp its transverse position along the entire longitudinal development in the containing compartment 129 and/or in the packet 20.

The one or more pairs of fins 50 can be associated with a single lateral face 40, 42, 44 of the filling insert 10 or fins 50 can be provided associated with each edge 43, 45, 46 between two adjacent lateral faces 40 , 42, 44.

According to some embodiments, the fins 50 and the vertex line 46 cooperate with the containing compartment 129 of a drawer 128 and/or with the external containing casing 22 of a packet 20 so as to clamp the position of the filling insert 10, preventing any possible transverse displacements thereof.

According to possible solutions, the overall width given by the base lateral face 40 and by a pair of opposite fins 50 can be substantially equal to the width of the rear larger lateral wall 34 of a packet 20. In this way, in a finished packet 20, the lateral face 40, wrapped in the wrapping sheet 28, can be positioned adjacent to the larger rear lateral wall 34 with the fins 50 each facing toward a smaller lateral wall 36.

According to other embodiments, it can be provided that the filling insert 10 has a length of the base lateral face 40 bigger than that of the vertex edge 46, providing a rounded connection between them by means of a perimeter line that is rounded to define a neck 52 of rounded shape, segmented, or with mixed linear and segmented sections. The different lengths and the rounded neck 52 allow,

when the filling insert 10 is positioned inside a packet 20, to more easily reach the smoking articles 13 positioned around it inside the wrapping sheet 28.

According to possible solutions, the filling body 14 can be made as a solid body, for example in a plastic or polymeric material.

According to preferred embodiments, described with reference to figs. 2 and 3, the filling body 14 can have a box-like structure, that is, it can be empty inside.

According to a possible solution, the filling insert 10 can be made starting from a blank 100, or from a sheet material such as paperboard, cardboard, paper or suchlike, suitably shaped and worked, shown by way of example in fig. 4.

The blank 100 of the type used in the embodiments described here can be typically a flat sheet of cardboard, paperboard or paper, provided with pre-weakened folding lines or pre-creasing lines, which define panels and flaps to be folded to make the lateral faces of the filling insert 10. Hereafter, we will indicate, where possible, the flaps and panels of the blank 100 with a similar reference number, followed by an inverted comma (’), to that of the respective lateral faces of the filling insert 10 formed by said panels and flaps.

According to some embodiments, the blank 100 comprises a plurality of longitudinal panels 140’, 141’, 142’, 144’, connected to each other by longitudinal folding lines 143’, 145’ and by one or more intermediate folding lines 146’.

In particular, the blank comprises two external longitudinal folding lines 143’, 145’ that define respective external longitudinal panels 140’, 141' and at least one main central panel 149’.

According to some embodiments, the main central panel 149’ comprises at least one intermediate longitudinal folding line 146’ that defines intermediate longitudinal panels 142’, 144’.

According to some embodiments, the number of longitudinal panels 140’, 141’, 142’, 144’ is equal to the number of lateral faces 40, 42, 44 of the filling body 14 to be made, plus one. In this way, it is possible to define the prismatic shape of the filling body 14, stabilizing its shape by overlapping the external longitudinal panels 140’, 141’ located at the opposite ends of the blank 100 that define the first base lateral face 40.

According to these embodiments, the first base lateral face 40 can be partly

formed by the external longitudinal panel 140', and partly by the external longitudinal panel 141' superimposed on the external longitudinal panel 140'.

The intermediate longitudinal panels 142', 144', folded one with respect to the other with respect to the intermediate longitudinal folding line 146', respectively form the second and third lateral faces 42, 44, while the intermediate longitudinal folding line 146' forms the vertex segment 46.

The bigger external longitudinal panel 140' and the smaller external longitudinal panel 141', folded with respect to the respective adjacent intermediate longitudinal panels 142', 144' along the external longitudinal folding lines 143', 145' and superimposed one above the other, form the base lateral face 40.

The bigger external longitudinal panel 140' is advantageously folded toward the inside of the filling body 14 so as to abut against the external longitudinal folding line 145' inside the edge 45. In this way, it is possible to confer on the filling insert 10 a generally stable shape, without needing to provide the use of glues or adhesives between the overlapping external longitudinal panels 140', 141'.

The fact that the blank 100 has an asymmetrical shape with respect to the intermediate longitudinal folding line 146' is advantageous since it allows to obtain a filling insert 10 able to maintain its shape, at least in correspondence with the first base lateral face 40.

According to some embodiments, the external longitudinal folding lines 143', 145' and/or the intermediate longitudinal folding line 146' are partial folding lines, being provided with pre-creasing segments separated by cutting lines 147' that define cut out portions 150'. Advantageously, the cutting lines 147' are obtained or made on the main central panel 149'.

The cutting lines 147' have an at least in segments partly curved development that deviates from the straight line passing through the pre-creasing segments that define the external longitudinal folding lines 143', 145'.

The cut out portions 150' defined by the cutting lines 147' of the first external longitudinal folding line 143' and the second external longitudinal folding line 145' advantageously face each other. In this way, when the bigger external longitudinal panel 140' and the smaller external longitudinal panel 141' are

folded with respect to the intermediate longitudinal panels 142', 144' and superimposed, the cut out portions 150', extending continuously from the first base lateral face 40, form the fins 50.

Thanks to the fact that the cutting lines 147' are formed or made on the main central panel 149', it is possible to obtain the stabilization members 16, in particular the fins 50, that extend in opposite symmetrical directions in continuity with the first base lateral face 40 of the filling body 14.

According to further embodiments, the blank 100 can also provide that the intermediate longitudinal panels 142', 144' are symmetrically shaped with respect to the intermediate longitudinal folding line 146', providing a transverse cutting line 152' which defines, in use, the neck, or recess 52 of the filling insert 10.

Embodiments described here concern a forming apparatus 60 for the filling insert 10, comprising an incision and cutting unit 62 configured to incise and shape a blank 100 starting from a flat sheet of paperboard, paper or cardboard 64, for example wound in a coil, and a shaping unit 66 configured to shape the blank 100 and fold it as appropriate to form a filling insert 10 ready to be used.

According to some embodiments, the forming apparatus 60 also comprises a drawing device or a drawing roller 68, possibly cooperating with a conveyor plane or belt, and configured to feed the flat sheet of paperboard 64 in a direction of feed D to the incision and cutting unit 62.

According to some embodiments, the incision and cutting unit 62 comprises an incision device 70 configured to incise the flat sheet of paperboard 64 to make the external longitudinal folding lines 143', 145' and the intermediate longitudinal folding line 146' and/or cut it to make the cutting lines 147'.

In some embodiments, the incision device 70 can comprise a cylindrical roller, on whose external surface cutting elements are provided, suitable to incise and/or cut a sheet of paperboard 64 by exerting a pressure on it during the rotation of the roller around its central axis.

Downstream of the incision device 70, in the direction of feed D, the incision and cutting unit 62 comprises a cutting device 72, suitable to cut the flat sheet of paperboard 64 in a transverse direction to the direction of feed D, both to cut the blank 100 to size, and also to cut it along the transverse cutting line 152'.

According to some embodiments, at exit from the incision and cutting unit 62 a blank 100 is obtained which, in a view from above, is disposed on a substantially horizontal plane in the same position as the blank 100 in fig. 4.

According to some embodiments, the blank 100 exiting from the incision and cutting unit 62 is received by a removal device 76 configured to remove the blank 100 and transfer it in correspondence with the shaping unit 66.

According to embodiments described using figs. 5 and 6, the shaping unit 66 can be disposed above and offset laterally with respect to the incision and cutting unit 62. According to this embodiment, the removal device 76 can comprise holding members 78, suitable to hold a blank 100, lifting it from a support plane, and movement members, not shown. The movement members can be configured to move the holding members 78 and the blank 100 held by them from the substantially horizontal position to a substantially vertical position, rotating it by about 90° in the direction of rotation R.

In this vertical position, the external longitudinal folding lines 143', 145' and the intermediate longitudinal folding line 146' are disposed parallel to each other, in a horizontal position on a vertical lying plane, as shown by way of example with lines of dashes in fig. 5.

Embodiments described here using fig. 6 concern a shaping unit 66 configured to shape the blank 100 and obtain a filling insert 10 ready to be used.

According to some embodiments, the shaping unit 66 comprises a thruster device 80 configured to act on one side of the blank 100, and a contrast or counter-thruster device 82 configured to act on the opposite side of the blank 100, and cooperating with the thruster device 80 to fold the blank 100 at least along the intermediate longitudinal folding line 146'.

The thruster device 80 and the contrast device 82 are configured to translate in a forming direction F substantially perpendicular to the vertical lying plane of the blank 100 retained by the removal device 76, between respective inactive positions where they do not interfere with a blank 100, to cooperation positions where both are located in contact with an opposite side of the blank 100.

According to some embodiments, the thruster device 80 has a profile mating with the shape of the filling body 14, particularly the part opposite the base wall 40.

According to possible solutions, the thruster device 80 has a shaped body 84 with a shape having at least one edge 83 aligned on a horizontal plane, and suitable to act on the intermediate longitudinal folding line 146' and sides 85 with a shape mating with the intermediate longitudinal panels 142', 144' of the blank 100, and suitable to function as contrast planes to define the shape of the filling insert 10.

According to some embodiments, the shaped body 84 can have a triangular section shape with the vertex, that is, the edge 83 facing toward the contrast device 82. In this embodiment, the sides 85 can have a length corresponding to the transverse width of the intermediate longitudinal panels 142', 144', and an inclination corresponding to that of the lateral faces 42, 44.

According to some embodiments, the shaping unit 66 also comprises thrust members 86, configured to act on the cut out portions 150', to obtain the stabilization members 16 of the filling insert 10.

According to possible embodiments, the thrust members 86 can comprise protrusions or ridges associated with the shaped body 84 of the thruster device 80. For example, the thrust members 86 can be protrusions that protrude in correspondence with the edges of the sides 85, facing toward the contrast device 82, and able to act on the cut out portions 150'.

According to possible variant embodiments, the thrust members 86 can be separate members from the thruster device 80 but cooperating with the latter in the shaping steps of the blank 100.

According to some embodiments, the contrast device 82 has a contrast body 88 having a profile mating with the shape of the shaped body 84.

According to some embodiments, the shaping unit 66 also comprises a shaping drawer 90, having at least two shaping walls 92 mating in shape with the intermediate longitudinal panels 142', 144' and suitable to function as abutment elements for the latter during the folding steps along the respective external longitudinal folding lines 143', 145'.

According to some embodiments, the shaping drawer 90 is associated with suction members 94 configured to take in and hold the intermediate longitudinal panels 142', 144' of the blank 100 in contact with the shaping walls 92.

According to possible solutions, the thruster device 80, the contrast device 82,

and the shaping drawer 90 cooperate with each other to define both the final shape of the filling body 14 and also the stabilization members 16.

According to some embodiments, the shaping unit 66 also comprises a folding device 96 cooperating with the shaping drawer 90 and configured to fold the external longitudinal panels 140', 141' and define the base wall 40.

According to possible solutions, the folding device 96 comprises two folding members 97, 98 able to act respectively on the bigger external longitudinal panel 140' and on the smaller external longitudinal panel 141' so as to close the blank 100 and define the filling body 14.

According to some embodiments, the folding members 97, 98 can be connected to respective arms 102, pivoted to each other at a rotation pin 106, able to rotate with respect to the pin 106 in the rotation directions G1, G3, between a condition of non-interference and a condition of interference with the blank 100.

According to some embodiments, in the condition of interference, the folding members 97, 98 press on the bigger external longitudinal panel 140' and on the smaller external longitudinal panel 141', folding them along the respective external longitudinal folding lines 143', 145' and superimposing them one on the other.

Figs 7-11 refer to the shaping unit 66 according to some embodiments described here in different shaping steps of the filling insert 10.

A first shaping step, described with reference to fig. 7, provides to translate the blank 100 by means of the removal device 76 in the direction of rotation R, from the substantially horizontal position to the substantially vertical position.

A second shaping step, described with reference to fig. 8, provides to feed the contrast device 82 in the forming direction F until it is brought into contact with a surface of the blank 100.

A third shaping step, described with reference to fig. 9, provides to feed the thruster device 80 in the forming direction F until it is brought into contact with the opposite surface of the blank 100.

In particular, the thruster device 80 and the contrast device 82 cooperate to hold the blank 100 between them, releasing the removal device 76 which can go back and pick up a new blank 100.

The thruster device 80 and contrast device 82 then cooperate to translate the

blank 100 in the forming direction F until the blank 100 is at least partly inserted inside the shaping drawer 90.

According to some embodiments, the contrast body 88 of the contrast device 82 in this step can cooperate with the shaping walls 92 to define the shape of the filling insert 10.

A fourth shaping step, described with reference to fig. 10, provides to make the thruster device 80 retreat in the forming direction F and to retain the blank 100 in the shaping drawer by means of the suction members 94.

Finally, a fifth shaping step, described with reference to fig. 11, provides to take the folding members 97, 98 respectively into contact with the bigger external longitudinal panel 140' and with the smaller external longitudinal panel 141' of the blank 100 and fold them along the respective external longitudinal folding lines 143', 145' so as to superimpose them one above the other and define the base wall 40.

In particular, the bigger external longitudinal panel 140' is folded inside with respect to the smaller external longitudinal panel 141', so that the edge of the bigger external longitudinal panel 140' abuts against the external longitudinal folding line 145' of the smaller external longitudinal panel 141' and stably defines the shape of the filling insert 10.

In this way, at the end of the fifth step, inside the shaping drawer 90, a filling insert 10 is obtained which can be used in subsequent steps of making a packet 20 of smoking articles 13.

According to some embodiments, a thruster device 104 can be associated with the forming apparatus 60 of the insert, configured to translate the filling insert 10 from the shaping drawer 90 to a drawer 128 for forming organized groups 12 of smoking articles 13.

According to possible embodiments, the thruster device 104 can comprise one or more actuation members and/or motion transmission mechanisms, such as for example an intrinsically linear movement actuator, or configured to convert a circular movement or even a tilting movement into a linear movement.

Embodiments described here with reference to figs. 12 and 13 also concern a machine 120 for forming organized groups 12 of smoking articles 13.

According to some embodiments, a machine 120 comprises a feed unit 122,

for example a loading hopper, configured to receive a stream of smoking articles 13 to be arranged in organized groups 12, a transfer unit 124 to transfer the organized groups 12 of smoking articles 13, and an introduction unit 126 to introduce organized groups 12 of smoking articles 13 into suitable receiver members or drawers 128 on the transfer unit 124.

The drawers 128 comprise lateral walls that define a housing compartment 129 suitable to contain inside it one or more organized groups 12 of smoking articles 13 and at least one filling insert 10.

According to some embodiments, the feed unit 122 is advantageously vertical with respect to a horizontal support plane of the machine 120 and can be positioned downstream of the introduction unit 126 and upstream of the transfer unit 124 where there are the drawers 128, in an alignment direction T parallel to the alignment direction of the smoking articles 13 in the feed unit 122.

In this way, the introduction unit 126 can, on each occasion, translate the organized groups 12 of smoking articles 13 fed by the feed unit 122 and introduce them into the respective drawers 128 of the transfer unit 124.

According to some embodiments, the introduction unit 126 comprises a plurality of thruster elements 130, equal in number to the number of drawers 128 to be filled on each occasion.

According to some embodiments, the introduction unit 126 comprises one or more actuation members, not shown in the drawings, configured to drive in the desired manner the translation of the thruster elements 130 between a condition of non-interference with the organized groups 12 of smoking articles 13 and a condition of transfer into the respective drawers 128 of the transfer unit 124.

According to some embodiments, the transfer unit 124 can rotate around a central axis X along a transfer path P to take the drawers 128 from at least one entrance station 132 for the smoking articles, into which the organized groups 12 of smoking articles 13 are introduced, to an exit station 134, in which the organized groups 12 are picked up and sent to subsequent packaging steps.

According to some embodiments of the present invention, upstream of the entrance station 132 of the smoking articles, along the transfer path P, an entrance station 136 for the inserts is disposed, in which the filling inserts 10 are introduced.

According to these embodiments, the filling insert 10 is inserted into a drawer 128 before the introduction of the organized groups 12 of smoking articles 13.

According to possible solutions, it can be provided that the thruster elements 130 are configured so as to introduce the organized groups 12 of smoking articles 13 into the space outside the volume defined and/or occupied by the filling body 14.

According to possible variant solutions, for example where the filling body 14 has a box-like shape, the thruster elements 130 can be configured to introduce the organized groups 12 of smoking articles 13 into the space outside the volume defined by the filling body 14, or in the internal space.

According to some embodiments, described with reference to figs. 12 and 13, in correspondence with the insert entrance station 136, the forming apparatus 60 of the insert can be disposed, positioned so that the shaping unit 66 is disposed aligned with a drawer 128.

In particular, according to these embodiments, in the insert entrance station 136, the shaping drawer 90 and the housing compartment 129 of a drawer 128 are perfectly aligned with each other in the axial direction L of the filling insert 10.

According to these embodiments, the filling insert 10 can be formed in line starting from the flat sheet of paperboard 64, it can be cut and shaped by the insert forming apparatus 60 and inserted directly into the housing compartment 129 of a drawer 128, translating it in the axial direction L by the thruster device 104.

According to this embodiment, it can be provided that the folding device 96 is associated with the transfer unit 124 so that the movements of the latter are correlated to each other.

For example, it can be provided that the connection pin 106 between the two arms 102 of the folding device 96 is centered on the central axis X of the transfer unit 124.

In particular, according to some embodiments, the insert forming apparatus 60 can be disposed in an alignment direction T, on the opposite side of the transfer unit 124 with respect to the feed hopper 122 and the introduction unit 126.

In this way, the filling insert 10 and the organized groups 12 of smoking articles 13 are inserted into a respective drawer 128 in parallel directions but in

opposite senses.

Thanks to the presence of the stabilization members 16, the filling insert 10 according to the present invention, once inserted in a drawer 128, remains stably positioned inside the housing compartment 129 thanks to the stabilization members 16 which abut against opposite lateral walls of the housing compartment 129 and prevent any displacement of the filling insert 10 in the transverse direction.

The use of a filling insert 10 suitable for self-positioning and self-stabilization in a drawer 128 advantageously allows to reduce the complexity of the packaging machine 120 and to speed up the process of forming and packing the organized groups 12 of smoking articles 13, since it is not necessary to provide further additional stabilizing elements.

According to some embodiments, downstream of the exit station 134 a wrapping device can be provided, not shown in the drawings, configured to wrap the organized groups 12 of smoking articles 13, associated with the respective filling insert 10, in a wrapping sheet 28, before sending them to the next steps of packaging a packet 20.

It is clear that modifications and/or additions of parts can be made to the filling insert and the respective forming apparatus and method as described heretofore, without departing from the field and scope of the present invention.

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 shall certainly be able to achieve many other equivalent forms of filling insert and the respective forming apparatus and method, having the characteristics as set forth in the claims and hence all coming inside the field of protection defined thereby.

In the following claims, the sole purpose of the references in brackets is to facilitate reading: they must not be considered as restrictive factors with regard to the field of protection claimed in the specific claims.

CLAIMS

1. Filling insert for a packet (20) of smoking articles (13) organized in one or more groups (12), **characterized in that** said filling insert comprises a filling body (14) and stabilization members (16) defined by appendixes protruding toward the outside from the lateral surface of said filling body (14), wherein said stabilization members (16) extend in opposite symmetrical directions continuously with a first base lateral face (40) of said filling body (14).

2. Filling insert as in claim 1, **characterized in that** said filling insert has a shape and sizes suitable to be inserted into a containing compartment (129) of a drawer (128) for forming organized groups (12) of smoking articles (13), wherein the transverse length of said stabilization members (16) is correlated to the transverse size of the containing compartment (129) in order to prevent transverse movements of said filling insert inside said containing compartment (129).

3. Filling insert as in claim 1 or 2, **characterized in that** said filling body (14) has a prismatic shape with a lateral surface defined by said first base lateral face (40) and at least two lateral faces (40, 42, 44).

4. Filling insert as in claim 3, **characterized in that** said stabilization members (16) protrude from an edge defined by two of said adjacent lateral faces (40, 42, 44).

5. Filling insert as in any claim hereinbefore, **characterized in that** said filling body (14) has a triangular section shape, comprising said first lateral face (40) that functions as a base and a second and a third lateral face (42, 44) that function as sides.

6. Filling insert as in any of the claims from 1 to 5, **characterized in that** said filling body (14) has a box-like shape, being empty inside.

7. Filling insert as in any of the claims from 1 to 5, **characterized in that** said filling body (14) is made as a solid body.

8. Combination of a drawer (128) for forming organized groups (12) of smoking articles (13) and a filling insert (10)as in any of the claims from 1 to 7, suitable to self-position itself in a containing compartment (129) of said drawer (128), wherein said filling insert (10) has a shape and sizes suitable to be inserted into said containing compartment (129) of said drawer (128), wherein the transverse

length of said stabilization members (16) is correlated to the transverse size of the containing compartment (129) in order to prevent transverse movements of said filling insert (10) inside the containing compartment (129).

9. Apparatus to form a filling insert (10) for a packet (20) of smoking articles (13) organized in one or more groups (12), **characterized in that** it comprises:

- means to supply a flat blank (100), which has two external longitudinal folding lines (143', 145') which define respective external longitudinal panels (140', 141'), and at least a main central panel (149'), wherein the main central panel (149') comprises at least an intermediate longitudinal folding line (146') that defines intermediate longitudinal panels (142', 144') and wherein at least one of the longitudinal folding lines (143', 145', 146') comprises pre-creasing segments separated by cutting lines (147') that define cut out portions (150'), wherein said cutting lines (147') are made on said main central panel (149'); and
- a shaping unit (66) configured to shape said flat blank (100) and form a filling insert (10), as in any of the claims from 1 to 7, said shaping unit (66) comprising:
- a thruster device (80), able to act, on one lateral of said blank (100), at least on said intermediate folding line (146'), to define said intermediate longitudinal panels (142', 144');
- a contrast device, or counter-thruster (82), cooperating with said thruster device (80) and configured to act on the opposite lateral of said blank (100) with respect to said thruster device (80);
- a folding device (96) configured to fold said external longitudinal panels (140', 141'), overlapping them one over the other to close said blank (100) and define a filling body (14) of said filling insert (10); and
- thrust members (86), configured to act on said cut out sections (150') to make stabilization members (16) of said filling insert (10) defined by appendixes protruding toward the outside from the lateral surface of said filling body (14), wherein said stabilization members (16) extend in opposite symmetrical directions continuously with a first base lateral face (40) of said filling body (14).

10. Apparatus to form an insert as in claim 9, **characterized in that** said means to supply a blank (100) comprise an incision and cutting unit (62) provided with:

- an incision device (70), configured to make, on a flat sheet of paperboard, paper or cardboard (64), said external longitudinal folding lines (143', 145'), and said

at least one intermediate folding line (146'), wherein at least one of the longitudinal folding lines (143', 145', 146') comprises pre-creasing segments separated by cutting lines (147') that define cut out sections (150'); and

- a cutting device (72), configured to cut said flat sheet (64) in a direction transverse to a direction of feed (D) of said flat sheet (64), at least to cut said blank (100) to size.

11. Apparatus to form an insert as in claim 10, **characterized in that** it comprises a removal device (76), configured to remove said blank (100) exiting from said incision and cutting unit (62) and transfer it in correspondence to said shaping unit (66), said removal device (76) being provided with holding members (78) to hold said blank (100), and with movement members configured to move said holding members (78) and said blank (100) from a substantially horizontal position, aligned with said incision and cutting unit (62), to a substantially vertical position, aligned with said shaping unit (66).

12. Method to form a filling insert (10) for a packet (20) of smoking articles (13) organized in one or more groups (12), **characterized in that** it comprises:

- a step of feeding a flat blank (100) that has two external longitudinal folding lines (143', 145'), which define respective external longitudinal panels (140', 141'), and at least a main central panel (149)', wherein the main central panel (149') comprises at least an intermediate longitudinal folding line (146'), which defines intermediate longitudinal panels (142', 144'), and wherein at least one of the longitudinal folding lines (143', 145', 146') comprises pre-creasing segments separated by cutting lines (147') that define cut out portions (150'), wherein said cutting lines (147') are made on said main central panel (149');

- a step of shaping said blank (100) to form a filling insert (10) as in any of the claims from 1 to 7, during which said main central panel (149') is folded along the at least one intermediate longitudinal folding line (146') to define said intermediate panels (142', 144') and of inclining them with respect to each other as a function of the shape of the section of a filling body (14) of said filling insert (10);

- a closing step, during which the external longitudinal panels (140', 141') are folded along the respective external longitudinal folding lines (143', 145'), and are positioned one on top of the other to define said filling body (14),

wherein during the shaping and/or closing step, in correspondence with said cutting lines (147') the formation of stabilization members (16) of said filling insert (10) is determined, defined by appendixes protruding toward the outside from the lateral surface of said filling body (14), wherein said stabilization members (16) extend in opposite symmetrical directions continuously with a first base lateral face (40) of said filling body (14).

13. Method to form an insert as in claim 12, **characterized in that**, upstream of the feed step, said method to form an insert comprises:

- making, on a flat sheet of paperboard, paper or cardboard (64), external longitudinal folding lines (143', 145') and/or intermediate longitudinal folding lines (146'), defining said external longitudinal panels (140', 141') and said intermediate longitudinal panels (142', 144');
- cutting said flat sheet (64) along said cutting lines (147') in correspondence with at least one of said longitudinal folding lines (143', 145', 146') to define cut out portions (150');
- cutting said flat sheet (64) transversely to obtain said blank (100).

14. Method to form an insert as in claim 12 or 13, **characterized in that** said method comprises:

- removing a blank (100) exiting from an incision and cutting unit (62) with a removal device (76) provided with holding members (78);
- translating said blank (100) held by said holding members (78) from a substantially horizontal position aligned with said incision and cutting unit (62) to a substantially vertical position in correspondence with a shaping unit (66).

15. Machine to form organized groups (12) of smoking articles (13) comprising:

- a feed unit (122), configured to receive a stream of smoking articles (13) to be arranged in organized groups (12);
- a transfer unit (124) of the organized groups (12) of smoking articles (13) provided with a plurality of forming drawers (128) and able to move said drawers (128) step-wise along a transfer path (P) between an entrance station (132) of the smoking articles and an exit station (134) of said organized groups (12);
- an introduction unit (126) configured to introduce said organized groups (12) of smoking articles (13) in said drawers (128) in correspondence with said entrance

station (132) of smoking articles,

characterized in that said machine comprises:

- an apparatus (60) to form a filling insert (10) as in any of the claims from 9 to 11 and
- a thruster device (104), configured to translate said filling insert (10) from said shaping unit (66) to a drawer (128) in correspondence with an entrance station (136) of the inserts located upstream of said entrance station (132) of the smoking articles along said transfer path (P).

16. Machine as in claim 15, **characterized in that** said apparatus (60) to form the insert is disposed in a direction of alignment (T) on the opposite lateral of said transfer unit (124) with respect to said feed unit (122) and to said introduction unit (126).

17. Method to form organized groups (12) of smoking articles (13) that provides to:

- supply a stream of smoking articles (13) in a feed unit (122);
- obtain organized groups (12) of smoking articles (13) from said feed unit (122);
- selectively introduce one or more of said organized groups (12) of smoking articles (13) into a containing compartment (129) of a drawer (128) of a transfer unit (124) when said drawer (128) is in an entrance station (132) of the smoking articles along a transfer path (P);

characterized in that, before the introduction of said organized group (12) of smoking articles (13), said method comprises:

- incising and/or cutting a blank (100) starting from a flat sheet of paperboard, paper or cardboard (64);
- shaping said blank (100) and folding it to form a filling insert (10) as in any of the claims from 1 to 7;
- inserting said filling insert (10) into said containing compartment (129) of said drawer (128) in correspondence with an entrance station (136) of the inserts located upstream of said entrance station (132) of the smoking articles along said transfer path (P), positioning said filling insert (10) in a stable manner in said containing compartment (129) by means of said stabilization members (16);
- moving said drawer (128) containing said filling insert (10) into said entrance station (132) of the smoking articles.

18. Method to form organized groups (12) of smoking articles (13) as in claim 17, **characterized in that**, after the introduction of said organized groups (12) of smoking articles (13) it provides to:

- move said drawer (128) containing said filling insert (10) and said organized groups (12) of smoking articles (13) into an exit station (134) and
- extracting said filling insert (10) and said organized groups (12) of smoking articles (13) together from said drawer (128);
- wrapping said filling insert (10) and said organized groups (12) of smoking articles (13) in a wrapping sheet (28) to form a bundle.

19. Packet of smoking articles comprising a rigid external containing casing (22) and an upper lid (24) hinged to the external containing casing (22) by means of a hinge (26), said packet (20) in the closed condition of said lid (24) having a parallelepiped rectangular shape, delimited laterally by two larger lateral walls, front (32) and rear (34), parallel and opposite to each other, and by two smaller lateral walls (36), also parallel and opposite to each other, wherein said external containing casing (22) contains inside it an internal assembly comprising one or more organized groups (12) of smoking articles (13) and at least a filling insert (10), as in any of the claims from 1 to 7, wrapped by a wrapping sheet (28), possibly partly enclosed by an internal casing (30), wherein the filling insert (10) has shape and sizes suitable to be inserted into the external containing casing (22), wherein the transverse length of the stabilization members (16) is correlated to the transverse size of a compartment defined by the larger (32, 34) and smaller (36) lateral walls to prevent transverse movements of the filling insert (10) inside said compartment.

20. Blank to make a filling insert (10), **characterized in that** said blank comprises two external longitudinal folding lines (143', 145') that define respective external longitudinal panels (140', 141'), and at least a main central panel (149'), wherein the main central panel (149') comprises at least an intermediate longitudinal folding line (146') that defines intermediate longitudinal panels (142', 144') and wherein at least one of said longitudinal folding lines (143', 145', 146') comprises pre-creasing segments separated by cutting lines (147') that define cut out portions (150'), wherein said cutting lines (147') are made on said main central panel (149').

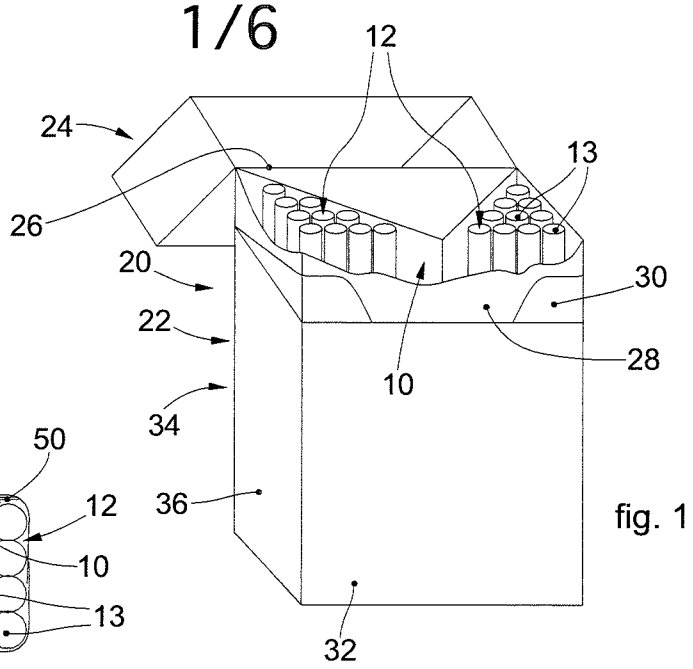


fig. 1

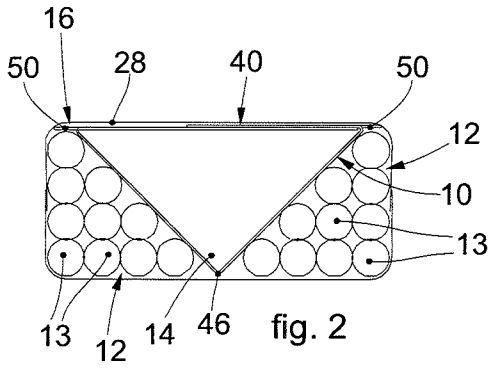


fig. 2

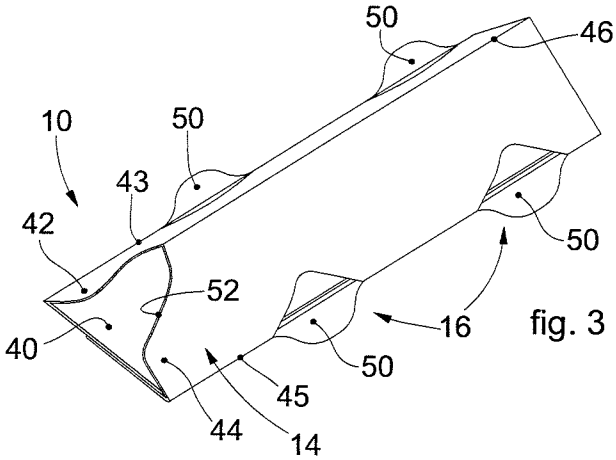


fig. 3

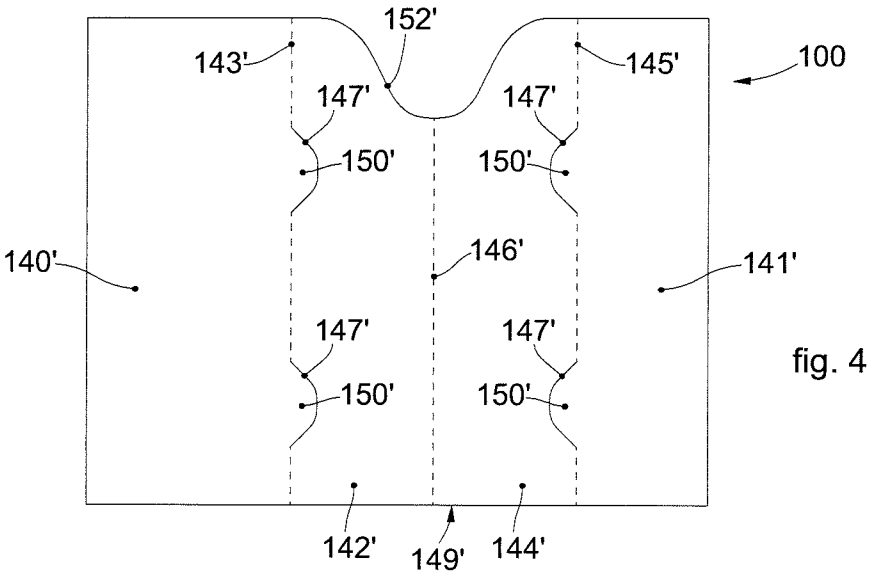


fig. 4

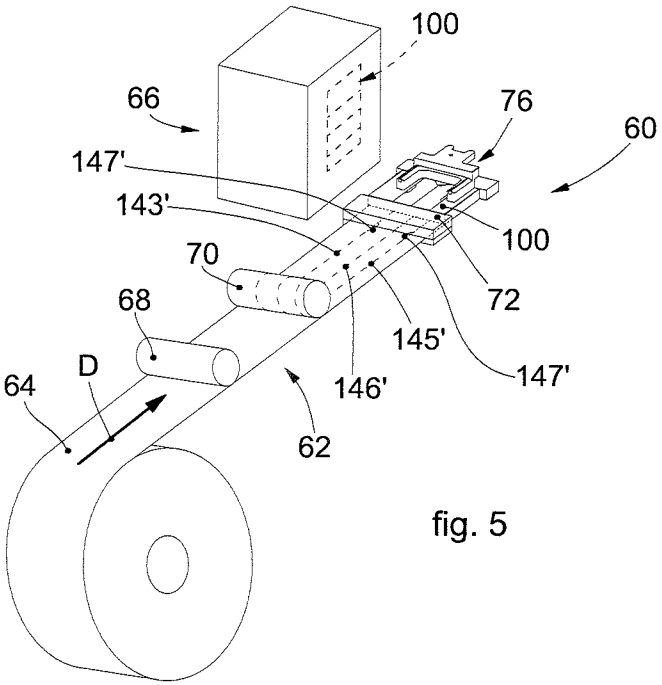
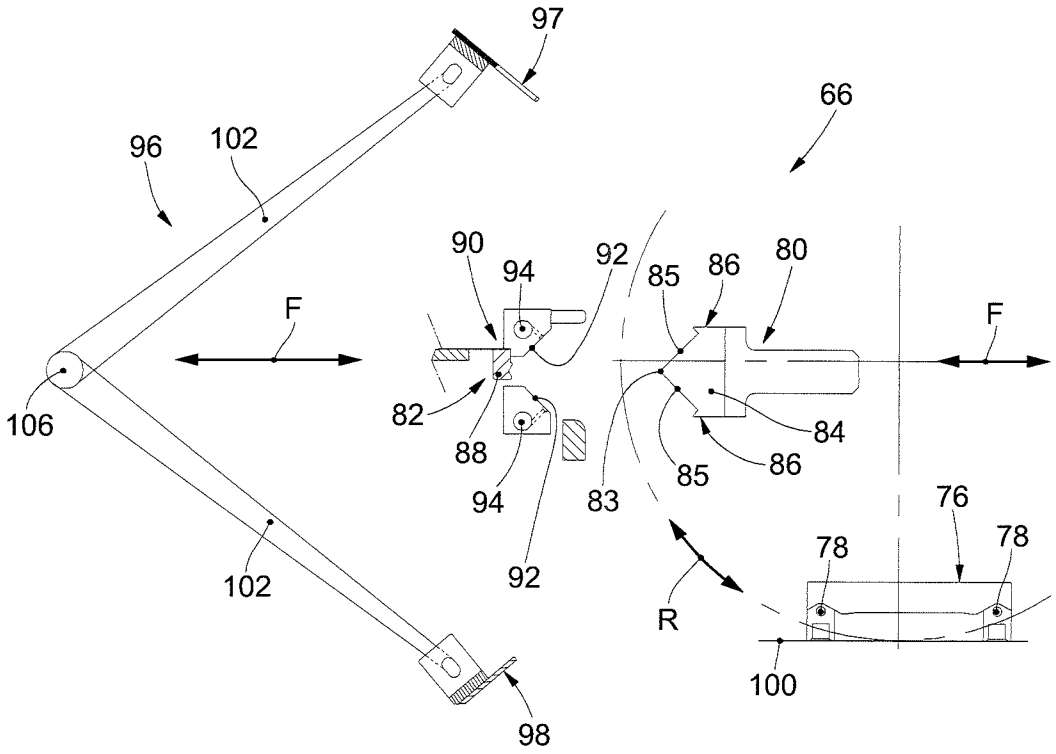

100
66
76
60
147'
143'
100
70
72
68
145'
147'
D
64
146'
62

fig. 5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94
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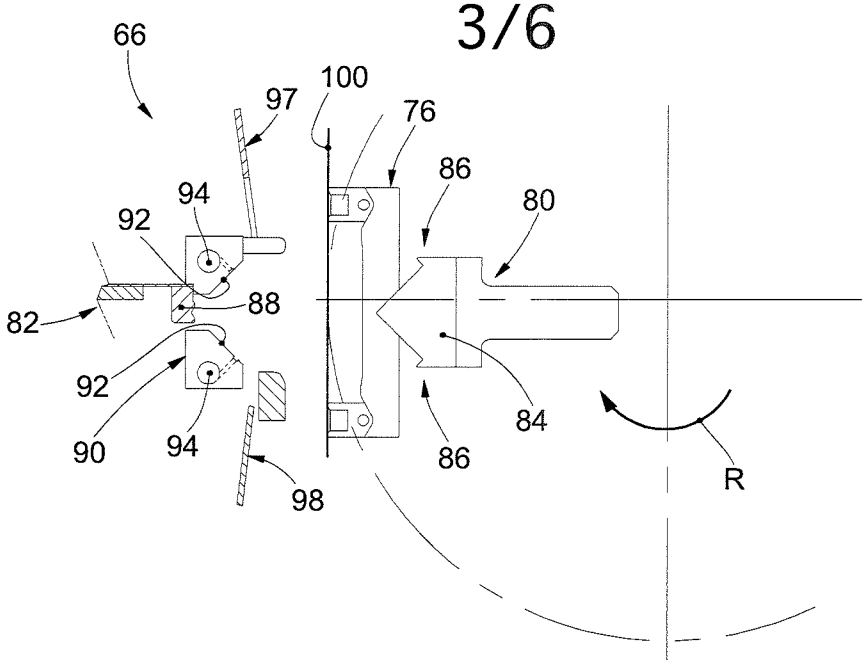
98
100

fig. 6


66
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100
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94
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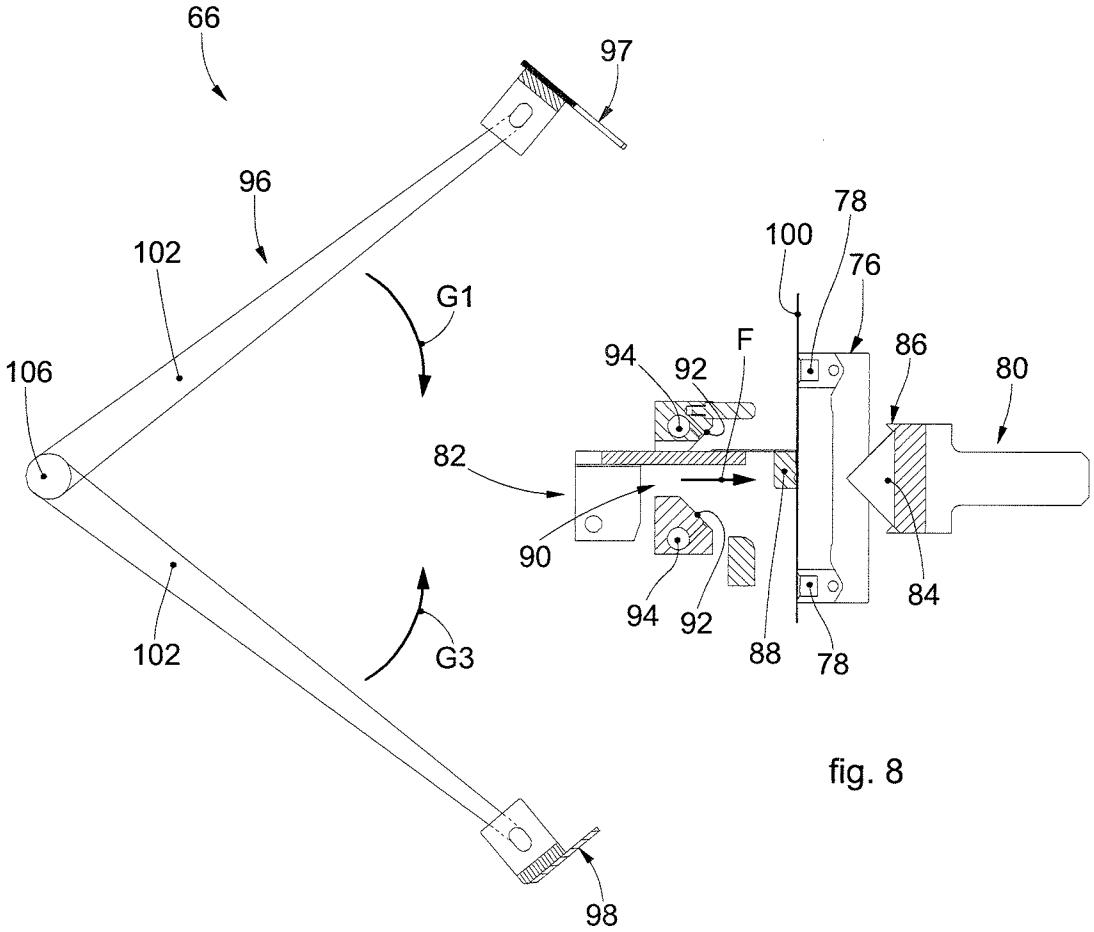
94
84
86
98
R

fig. 7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78
84
102
G3
98

fig. 8

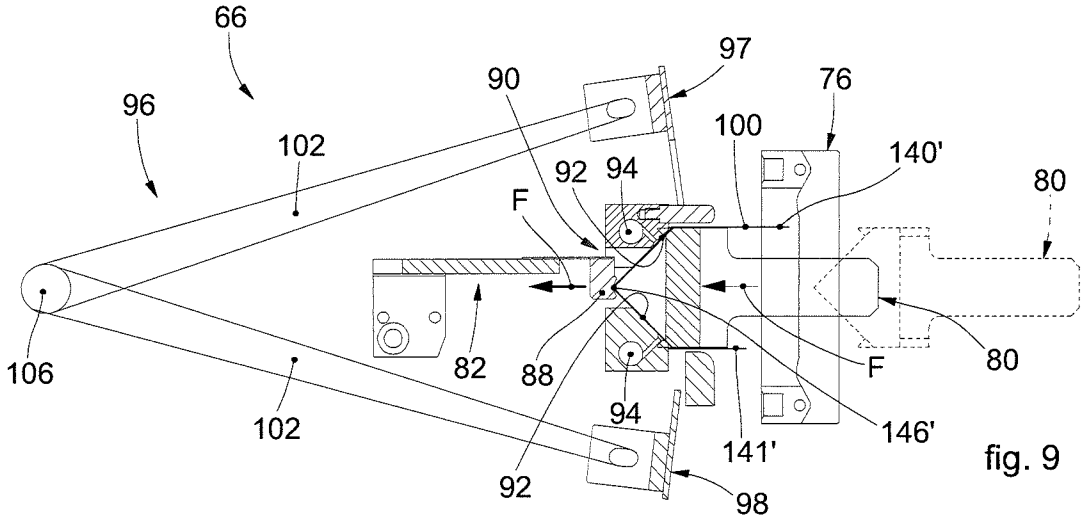


fig. 9

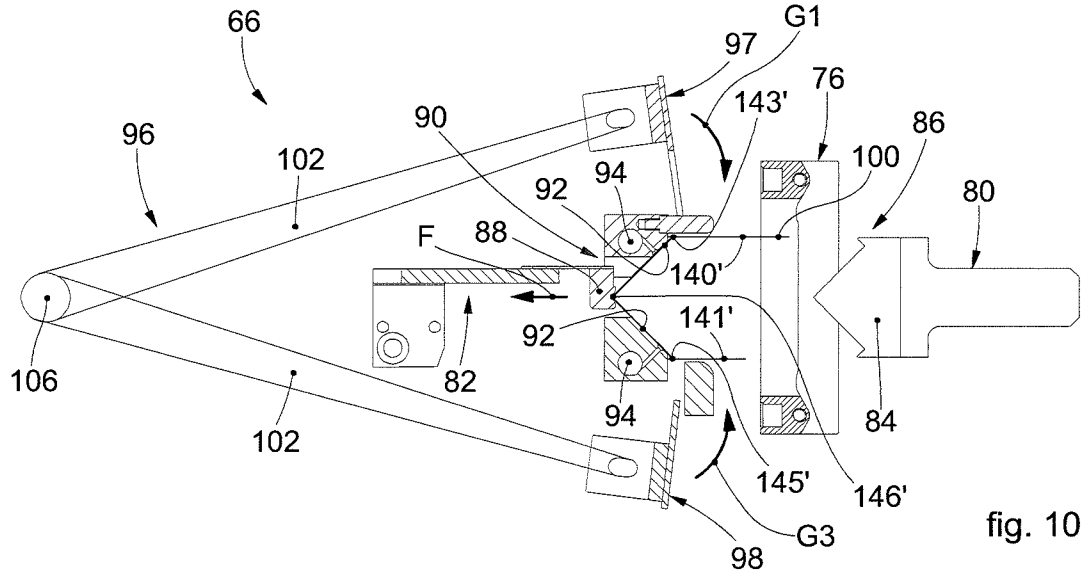


fig. 10

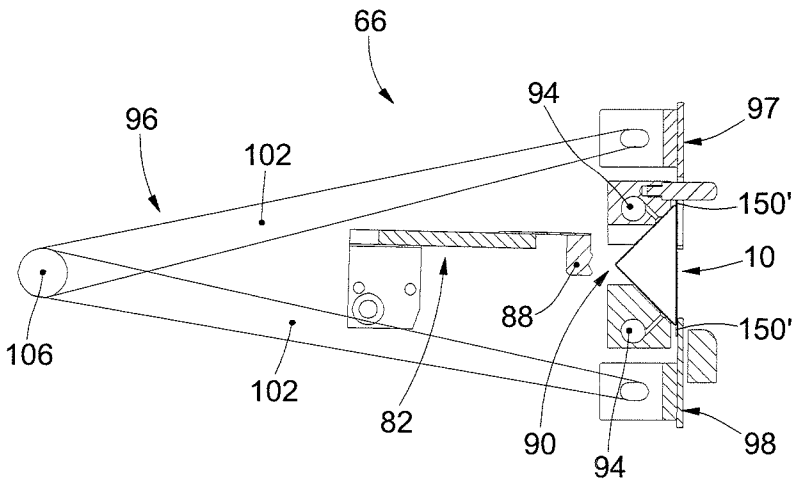
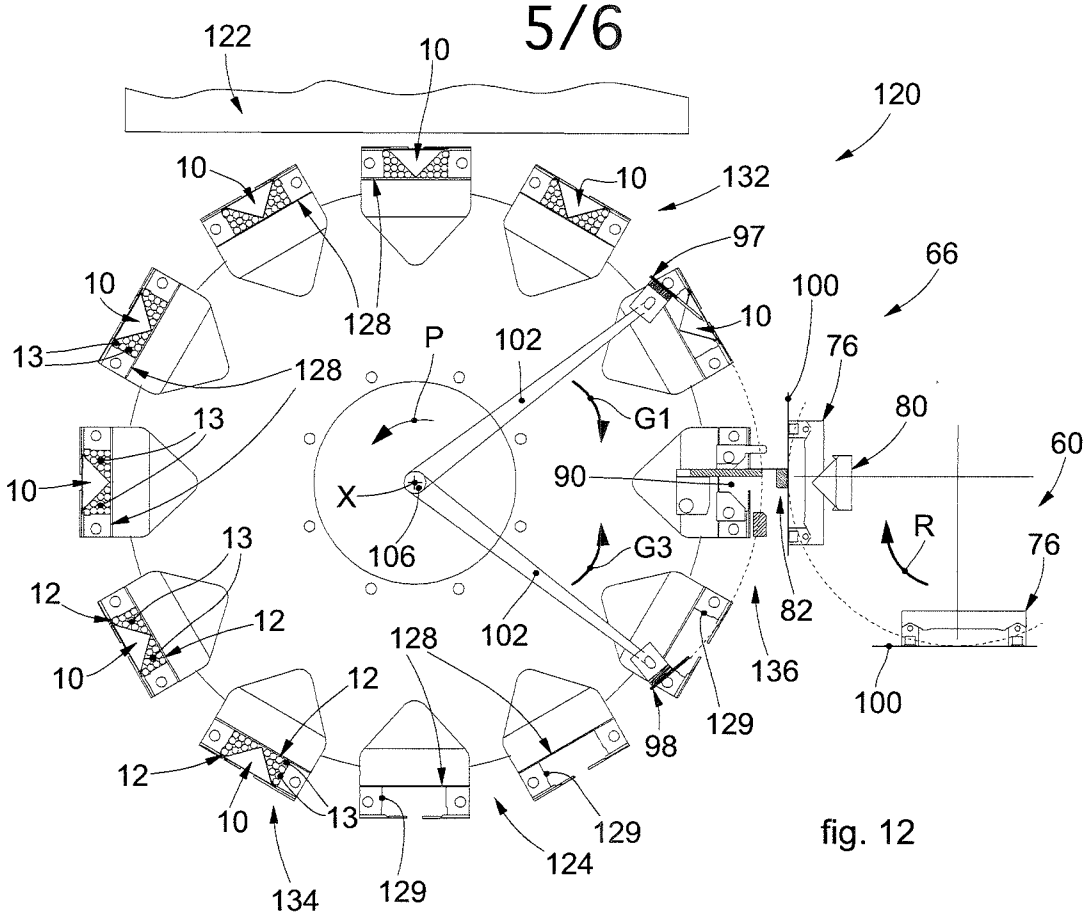


fig. 11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G3
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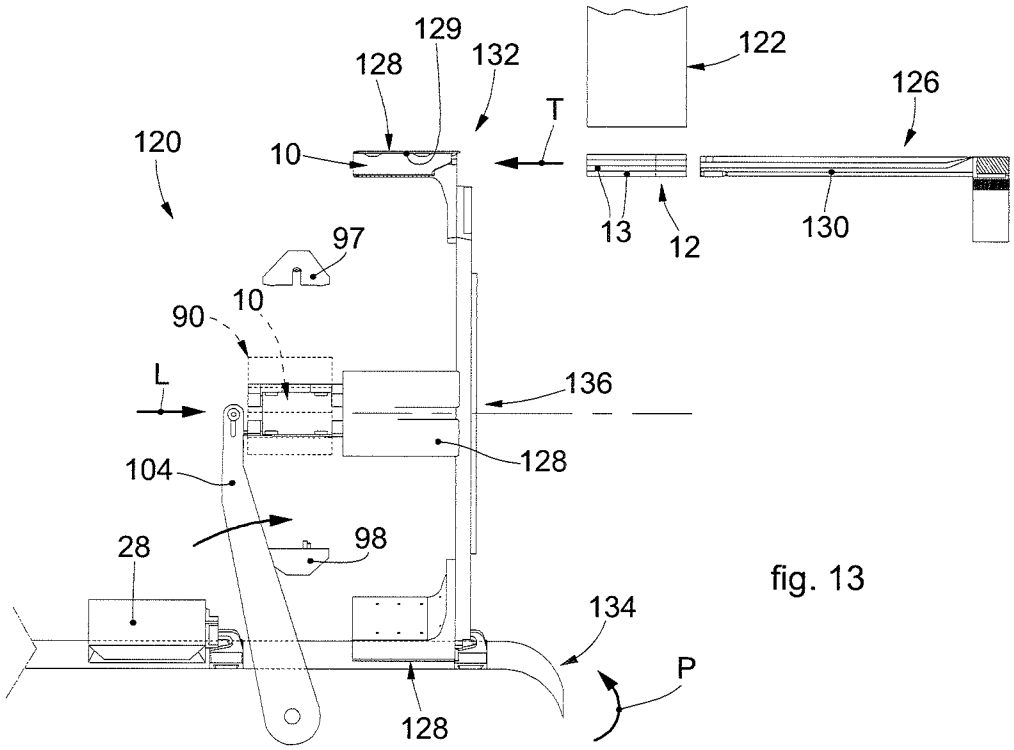
fig. 12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P
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fig. 13

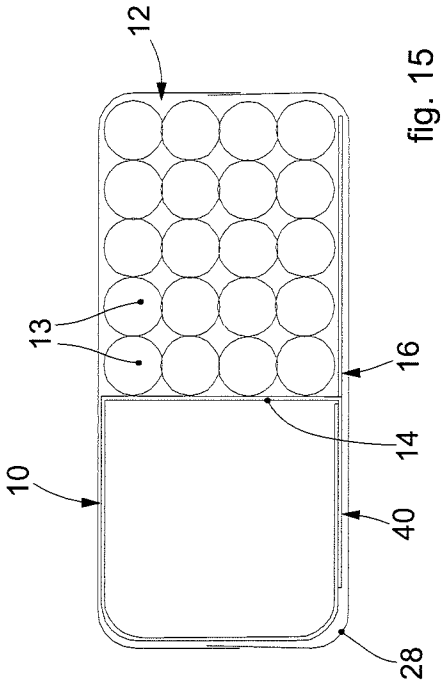

fig. 15

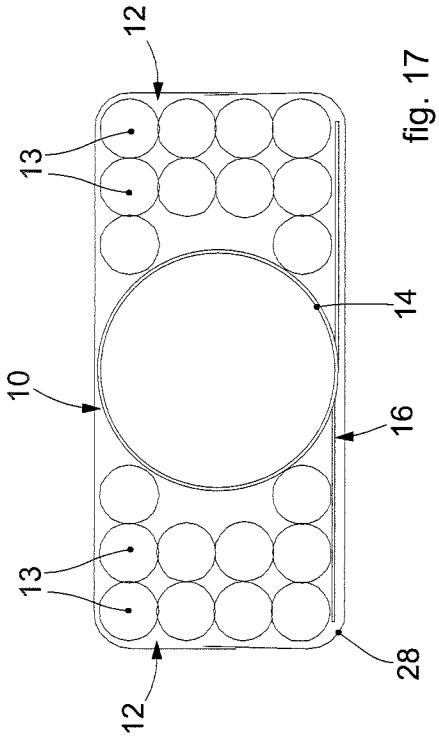

fig. 17

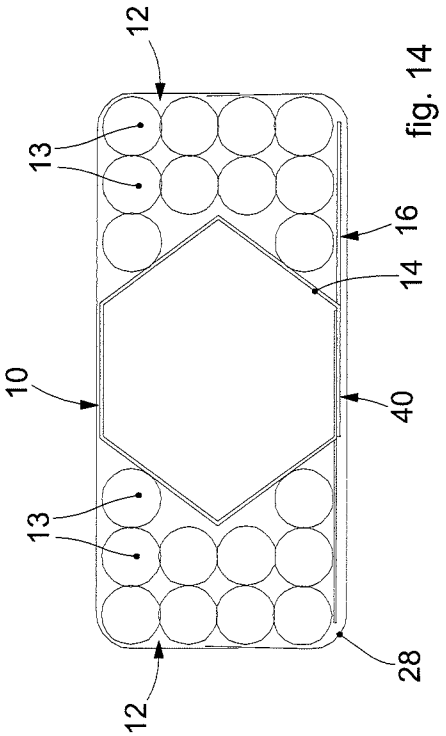

fig. 14

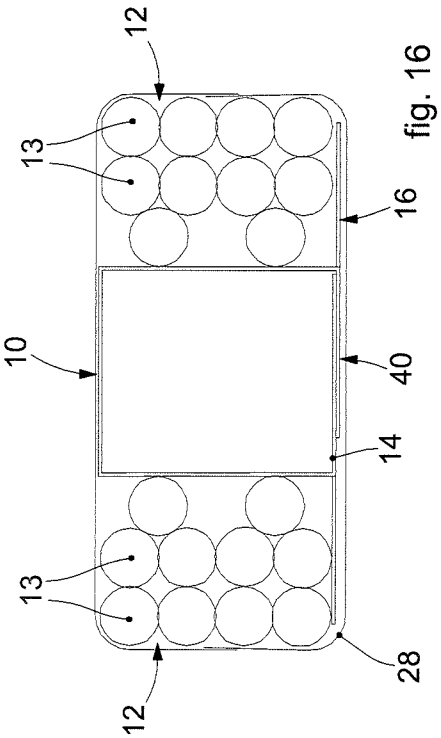

fig. 16

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/064413

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/10 B65D5/496 B65B19/04
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 B65B

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.
Y	DE 10 2015 014182 A1 (G D SOCIETÀ PER AZIONI [IT]) 4 May 2016 (2016-05-04) paragraphs [0009] - [0061] figures 7,8,28	8,17,18
A	WO 2016/083442 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 2 June 2016 (2016-06-02) pages 1-4 figures 1-4	1-20
A	DE 10 2014 116784 A1 (FOCKE & CO [DE]) 17 December 2015 (2015-12-17) paragraphs [0001] - [0116] figures 1-22	1-20
A	EP 2 982 607 A1 (GD SPA [IT]) 10 February 2016 (2016-02-10) figures 1-22	1-20

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
14 September 2017	29/09/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Duc, Emmanuel

5

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/064413

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 3 025 979 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 1 June 2016 (2016-06-01) figures 1-5	1-20
X Y	WO 2016/088063 A1 (GD SPA [IT]) 9 June 2016 (2016-06-09) pages 1-14 figures 1-12	1-4,6,7, 19 8,17,18
X	WO 2015/114588 A1 (GD SPA [IT]) 6 August 2015 (2015-08-06) pages 1-18 figures 4-6	20
Y	DE 10 2014 110440 A1 (FOCKE & CO [DE]) 3 December 2015 (2015-12-03) paragraphs [0099], [0100] figures 1, 3, 4	8,17,18
Y	DE 10 2014 007415 A1 (FOCKE & CO [DE]) 26 November 2015 (2015-11-26) paragraphs [0062], [0063] figures 1, 3, 9	8,17,18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2017/064413

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 9-14, 19, 20

Filling insert;
Method to form a filling insert;
Apparatus to form a filling insert;
Packet of smoking articles;
Blank to make a filling insert

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2. claims: 8, 15-18

Combination of a drawer for forming organized groups of smoking articles;
Machine to form organized groups of smoking articles;
Method to form organized groups of smoking articles.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2017/064413

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102015014182 A1	04-05-2016	NONE	
WO 2016083442 A1	02-06-2016	EP 3224148 A1	04-10-2017
		WO 2016083442 A1	02-06-2016
DE 102014116784 A1	17-12-2015	DE 102014116784 A1	17-12-2015
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		US 2017107047 A1	20-04-2017
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		PL 2982607 T3	30-06-2017
		RU 2015132424 A	08-02-2017
EP 3025979 A1	01-06-2016	NONE	
WO 2016088063 A1	09-06-2016	EP 3227195 A1	11-10-2017
		WO 2016088063 A1	09-06-2016
WO 2015114588 A1	06-08-2015	EP 3099586 A1	07-12-2016
		WO 2015114588 A1	06-08-2015
DE 102014110440 A1	03-12-2015	NONE	
DE 102014007415 A1	26-11-2015	DE 102014007415 A1	26-11-2015
		WO 2015176784 A1	26-11-2015