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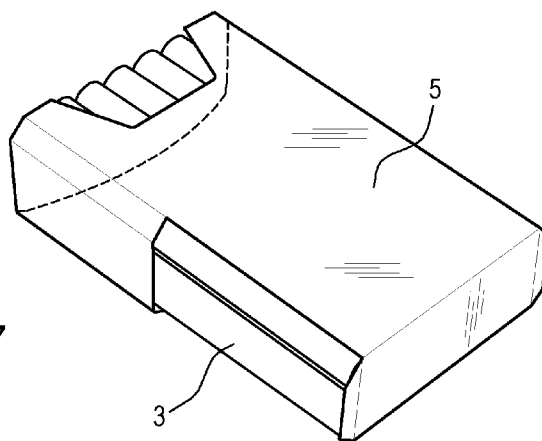
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- (54) **Title:** CIGARETTE PACKET AND METHOD FOR MAKING IT

FIG. 7



- (57) **Abstract:** A packet (1) of cigarettes (2) or other smokable articles, each having a first and a second end (201, 202), elongate in shape and extending along a longitudinal direction, comprises: a group (3) of cigarettes having a first zone (303), facing towards the first end of the cigarettes (2), and a second zone (304), longitudinally spaced from the first zone (303) and facing towards the second end of the cigarettes (2); a sealed wrapper (4) enclosing the group (3) of cigarettes, made from a film (401) of thermoplastic material and having an extraction opening through which the cigarettes (2) can be taken out; a sealing panel (402) applied to the opening of the sealed wrapper (4); a reinforcing element (5), made of thin cardboard, located inside the sealed wrapper (4) in contact with the group (3) of cigarettes to surround it at least partly, and having a front wall (501), a rear wall (502), two side walls (503) and a bottom wall (504) in contact with the first end (201) of the cigarettes (2). The reinforcing element (5), in the second zone (304) of the group (3) of cigarettes, annularly surrounds the group (3) of cigarettes and, in the first zone (303) of the group (3) of cigarettes, defines side openings (509).

DESCRIPTION

CIGARETTE PACKET AND METHOD FOR MAKING IT

Technical field

This invention relates to a packet of cigarettes or other smokable articles, each having a first and a second end, elongate in shape and extending
5 along a longitudinal direction. The invention also relates to a method for making the packet.

Background art

A packet of cigarettes contains a plurality of cigarettes placed side by side
10 to form a group. It also comprises an outer case or wrapper, which may be rigid or soft, and an inner wrapper made, for example, of foil paper wrapped around the group of cigarettes. Rigid outer cases come in several alternative kinds, which differ according to their edges, which may be sharp, bevelled (in which case the packet is referred to as "octagonal")
15 or rounded.

As regards the inner wrapper, known in the prior art is the use of a sealed wrapper made from a thermoplastic film and provided with a reclosable opening for taking out the cigarettes.

Examples of this type of solution are provided in the following patent
20 documents, in the name of the same Applicant as this invention: WO2014013478, WO2014013479, and WO2014013479; other examples are described in the following patent documents: WO9849072, WO2015062681, WO2013053408, WO2011110272, WO2011069575 and WO2011032625.

25 To wrap the group of cigarettes with the thermoplastic film, it is necessary to handle the group of cigarettes in a specific machine or machine section, for example of the flow-pack type.

This creates the risk of disarranging the cigarettes making up the group. Thus, a reinforcement element or collar is applied to the group of cigarettes. The reinforcing element is made of thin paperboard, at least partly surrounds the group of cigarettes and, in the finished packet, is located inside the sealed wrapper.

To properly fulfil its function of holding the cigarettes in the group together, the reinforcing element must be wrapped snugly around the group of cigarettes. In this respect, the solutions described in documents WO2014013478, WO2014013479, WO2014013479, WO2013053408, WO9849072 and WO2011069575 are disadvantageous because the reinforcing element is too loose and does not guarantee that the cigarettes in the group are held together while the sealed wrapper is being made.

Another problem that prevents the reinforcing element from effectively holding the cigarettes in the group in place is linked to the mechanical stability of the reinforcing element itself. In this regard, it is noted that the solutions of patent documents WO2011110272 and WO2011032625 are disadvantageous because the reinforcing element is relatively unstable. In particular, the reinforcing element of WO2011110272 is in the shape of a case and tends to sag, whilst the reinforcing element of WO2011032625 is relatively weak, especially at the top end zone of the group of cigarettes.

Another problem connected with making the sealed wrapper is that the cigarettes are subjected to considerable mechanical stress, with the risk of being damaged, especially at the filter end. In light of this, it is noted that the solution of document WO2015062681, as well as those of documents WO2014013478, WO2014013479, WO2014013479, WO2013053408, WO9849072 and WO2011069575 is limited because it does not effectively protect both ends of the group of cigarettes, especially the zone near the opening from which the cigarettes are taken

out, where the cigarette filters are.

Disclosure of the invention

This invention has for an aim to provide a packet of cigarettes (or other
5 smokable articles having a first and a second end, being elongate in
shape along a longitudinal direction) and a method for making the packet
and which overcome the abovementioned disadvantages of the prior art.

More specifically, the aim of this invention is to provide a packet of
cigarettes and a method for making it which is particularly precise and
10 easy to implement.

A further aim of the invention is to provide a packet of cigarettes and a
method for making it wherein the reinforcing element is particularly robust
and snugly wrapped.

Another aim is to provide a packet of cigarettes and a method for making
15 it wherein the reinforcing element, besides being snugly wrapped,
protects the cigarettes in the zone where the packet is opened.

A further aim of the invention is to provide a packet of cigarettes and a
method for making it wherein the reinforcing element is particularly easy
to make and requires only a very small quantity of glue.

20 These aims are fully achieved by the packet and the method forming the
object of this invention and as characterized in the appended claims.

More specifically, the invention relates to a packet of cigarettes, in
particular smokable articles having a first and a second end and being
elongate in shape along a longitudinal direction. For convenience of
25 description, specific reference is hereinafter made to cigarettes without
thereby limiting the scope of the patent to cigarettes only.

The packet contains a group of cigarettes placed side by side and
aligned. The group of cigarettes has a first zone facing towards the first
end of the cigarettes, and a second zone facing towards the second end
30 of the cigarettes The first and second zones of the group of cigarettes are

positioned one after the other in succession along the longitudinal direction defined by the group of cigarettes from the first to the second end; in other words, the first and second zones of the packet are longitudinally spaced.

5 The packet comprises a sealed wrapper which encloses the group of cigarettes. The sealed wrapper is made from a film of thermoplastic material. The sealed wrapper has an opening through which the cigarettes can be taken out. The packet also has a sealing panel, applied to the opening of the sealed wrapper, to allow it to be opened and closed
10 repeatedly.

The packet further comprises a reinforcing element which is operatively in contact with the group of cigarettes to at least partly surround it. The reinforcing element is made of thin cardboard, paperboard or paper. In the finished packet, the reinforcing element is positioned inside the sealed
15 wrapper.

The reinforcing element has a front wall, a rear wall, two side walls and a bottom wall. The bottom wall of the reinforcing element is operatively in contact with the first end of the cigarettes. It should be noted that the opening of the packet for taking out the cigarettes is located at the second
20 end of the cigarettes; the cigarette filters are also located at the second ends of the cigarettes.

In the second zone of the group of cigarettes, the reinforcing element annularly surrounds the group of cigarettes; in other words, it is in contact with all four sides of the group of cigarettes defined by lateral surfaces of
25 the cigarettes themselves. In the first zone of the group of cigarettes, on the other hand, the reinforcing element defines side openings, so that the side walls of the reinforcing element are present in a second portion of the reinforcing element but absent, that is, interrupted in a first zone of the reinforcing element (thus creating corresponding side openings). The first
30 zone of the reinforcing element is operatively coupled (or superposed, or

fitted over) the first zone of the group of cigarettes and the second zone of the reinforcing element is operatively coupled (or superposed, or fitted over) the second zone of the group of cigarettes.

In other words, in a zone of the group of cigarettes distal from the bottom wall (that is, the second zone of the group of cigarettes) the reinforcing element annularly surrounds the group of cigarettes, and in a zone of the group of cigarettes proximal to the bottom wall (that is, the first zone of the group of cigarettes) the reinforcing element defines the side openings.

The fact that the reinforcing element annularly surrounds the second zone of the group of cigarettes and, on the opposite side of the group of cigarettes, closes the first ends of the cigarettes with the bottom wall allows the reinforcing element itself to be stable and to be snugly wrapped around the group of cigarettes. It also means the filter zone is well protected.

The bottom wall of the reinforcing element is joined to the front wall and to the rear wall of the reinforcing element itself. The bottom wall, however, is not joined (directly) to the side walls because these are interrupted and replaced by the side openings, in the first portion of the reinforcing element, facing towards the bottom wall.

That means it is easier to make the reinforcing element from a flat blank.

The front wall of the reinforcing element has a tapered indentation to facilitate taking out the cigarettes. The tapered indentation is located in the second portion of the reinforcing element (distal from the bottom wall).

Preferably, the front wall and the rear wall of the reinforcing element extend for the full longitudinal extension of the cigarettes (that is, of the packet). This makes the reinforcing element even more stable and snugly wrapped without complicating its production.

Preferably, the side openings of the reinforcing element extend for at least half (preferably from 50% to 60%) of the total longitudinal extension of the reinforcing element. This makes it easier to securely join the reinforcing

element, reducing the use of adhesive material.

In effect, the reinforcing element is preferably closed by applying adhesive material (for example, hot-melt glue) to corresponding and at least partially overlapping flaps at joining (or junction) points.

5 In particular, these joining points are located in the second portion of the reinforcing element, that is, in the second zone of the group of cigarettes, distal from the bottom wall of the reinforcing element itself.

Preferably, the joining points are located on the side walls of the reinforcing element. This simplifies the forming of the reinforcing element
10 itself. It also allows reducing the quantity of paper or thin cardboard used to make the reinforcing element.

Alternatively, or in addition, the joining points are located on the front wall or on the rear wall.

It should be noted that the functional characteristics of the reinforcing
15 element must be such as to make the reinforcing element particularly suitable for a packet of one particular type, with reference in particular to packets with rigid outer case having sharp or bevelled edges.

In an example embodiment (designed in particular, but not exclusively, for octagonal packets), each of the two side walls of the reinforcing element
20 has a main side, positioned perpendicularly to the front and rear walls, and a first and a second connecting side, inclined to the main side. Each of the first and second connecting sides is joined along longitudinal edges to the corresponding main side and to the front or rear wall. This configuration allows the reinforcing element to be snugly wrapped around
25 the group of cigarettes and in turn wrapped in an outer case with bevelled edges.

This invention also provides a method for making a packet of cigarettes or other smokable articles having a first and a second end, and being elongate in shape along a longitudinal direction.

30 The method comprises a step of preparing a reinforcing blank made of

thin, flexible cardboard, or similar material, to form the reinforcing element.

The method comprises a step of coupling the reinforcing element to the group of cigarettes to surround it at least partly, in such a way that a
5 bottom wall of the reinforcing element is in contact with the first end of the cigarettes.

The method also comprises a step of making, by means of a film of thermoplastic material having an extraction opening for taking out the cigarettes and closed by a sealing panel, a sealed wrapper containing the
10 group of cigarettes and the reinforcing element coupled thereto.

The reinforcing element is coupled to the group of cigarettes in such a way as to surround it annularly in a second zone of the group of cigarettes, facing towards the second end of the cigarettes; in particular, in the second zone of the group of cigarettes, the reinforcing element
15 leaves the second ends of the cigarettes uncovered but surrounds the group of cigarettes on all four sides since, in that zone, it is in contact on all four sides with a lateral surface of the group of cigarettes adjoining the second ends of the cigarettes.

Further, the reinforcing element is coupled to the group of cigarettes in
20 such a way that the reinforcing element leaves it uncovered at the side openings of the self-same reinforcing element, in a first zone of the group of cigarettes facing towards the first ends of the cigarettes.

The reinforcing blank has a base with two short sides and two long sides. The reinforcing panel also has a front panel and a rear panel joined to
25 respective long sides of the base along fold lines and defining lateral edges. The reinforcing blank also has a first and a second lateral wing joined to the front panel or to the rear panel along corresponding longitudinal fold lines. More specifically, the fold lines (along which the first and the second lateral wing are joined to the front panel or to the rear
30 panel) are located in a part of the lateral edges of the front or rear panel

which is spaced longitudinally from the base; preferably, it is spaced longitudinally from the base by approximately (at least) half the longitudinal extension of the front panel or of the rear panel (which determine the total longitudinal extension of the reinforcing element itself).

5 Operatively, when coupling the reinforcing element to the group of cigarettes, the base of the blank is placed in contact with the first ends (first tip zones) of the cigarettes to form the bottom wall of the reinforcing element.

The front and rear panels are placed in contact with the group of cigarettes on opposite, parallel surfaces thereof to form the front wall and
10 the rear wall of the reinforcing element, respectively;

Next, the lateral wings (the at least one first and one second lateral wing) are folded along the respective fold lines to form the side walls of the reinforcing element and thus to surround the group of cigarettes annularly
15 in the second zone of the group of cigarettes (distal from the bottom wall of the reinforcing element).

To close the reinforcing element, the method preferably comprises a step of applying adhesive material (for example, hot-melt glue) to the lateral wings.

20 In this regard, it should be noted that both the front panel and the rear panel of the reinforcing blank are preferably provided with a respective pair of lateral wings.

More specifically, the first and second lateral wings of the reinforcing blank are preferably joined to the front panel (along corresponding
25 longitudinal fold lines located in a part of the lateral edges which is spaced from the base) and the reinforcing blank has a third and fourth lateral wing which are joined to the rear panel along corresponding longitudinal fold lines also located in a part of the lateral edges which is spaced from the base.

30 Operatively, the first and third lateral wings at least partially overlap (in a

longitudinally elongate overlap surface) and contribute to forming a corresponding side wall of the reinforcing element; similarly, the second and fourth lateral wings at least partially overlap (in a longitudinally elongate overlap surface) and contribute to forming the other side wall of the side walls of the reinforcing element.

These overlap surfaces extend longitudinally for a length less than (approximately half of) the total longitudinal extension of the reinforcing element because the side walls of the reinforcing element are interrupted in a stretch where the openings are defined.

This allows reducing the quantity of glue used. It also allows limiting the transverse extension of the lateral wings, thus reducing the amount of material wasted when making the reinforcing blanks.

In an example embodiment (designed in particular, but not exclusively, for octagonal packets), each of the two side walls of the reinforcing blank has at least a first and a second segment which are joined to each other along a longitudinal fold line; of these, the first segment is a main segment and at least a second segment is a connecting segment.

Operatively, when the reinforcing blank is folded and closed to form the reinforcing element, the main segment of each lateral wing of the reinforcing blank defines a main side of a corresponding side wall of the reinforcing element. The connecting segment of each lateral wing of the reinforcing blank defines a connecting side of a corresponding side wall of the reinforcing element, inclined to the respective main side. That way, the side walls of the reinforcing element include respective main sides which are parallel to each other and perpendicular to the front and rear walls of the reinforcing element and respective connecting sides which are inclined both to the main sides and to the front and rear walls.

The invention also provides a packing machine for packing in a packet a group of cigarettes or other smokable articles having a first and a second end, and being elongate in shape along a longitudinal direction.

The machine comprises a first wrapping section designed to be fed with reinforcing blanks and with (loose) cigarettes. The first wrapping section is configured to form groups of cigarettes from the loose cigarettes and to form reinforcing elements from the reinforcing blanks. The first wrapping
5 section couples the reinforcing elements to corresponding groups of cigarettes to at least partly surround them.

The machine also comprises a second wrapping section, of the flow-pack type. The second wrapping section is designed to be fed with a succession of articles, where each article consists of a group of cigarettes
10 and a corresponding reinforcing element coupled thereto. The second wrapping section is configured to enclose the individual articles in a sealed wrapper made from a film of thermoplastic material. The sealed wrapper is also provided with an opening for taking out the cigarettes and with a sealing panel applied to the opening.

The machine also comprises a third wrapping section configured to make an outer case for the sealed wrapper. More specifically, the third wrapping
15 section is preferably configured to make a rigid, box-shaped body containing the sealed wrapper and provided with a lid hinged to the shaped body.

The first wrapping section comprises a centring device configured to position a base of the reinforcing blank in alignment with the first end of
20 the cigarettes of the group of cigarettes.

The first wrapping section also comprises a folding unit for folding the reinforcing blank around the group of cigarettes to make the reinforcing
25 element coupled to the group of cigarettes itself.

The folding unit of the first wrapping section has first folder elements configured to fold the front panel and the rear panel of the reinforcing blank into contact with the group of cigarettes; the folding unit also has
30 second folder elements for folding the lateral wings of the reinforcing blank about corresponding longitudinal fold lines.

The first wrapping section also comprises gluer elements configured to apply adhesive material to at least one surface of the lateral wings in order to stably join the front panel and the rear panel of the reinforcing blank through the lateral wings in a zone of the group of cigarettes which is spaced longitudinally from the base of the reinforcing blank and facing
5 towards the second end of the cigarettes of the group of cigarettes.

First of all, the group of cigarettes is formed in the first wrapping section by a plurality of hoppers. The groups of cigarettes are housed in respective pockets which are movable as one with a conveyor.

10 Preferably, each group of cigarettes is transferred (by an extractor element) from the pocket to a corresponding sleeve. Each sleeve is longitudinally elongate and, at its longitudinal ends, has an inlet opening and an outlet opening to allow inserting the group of cigarettes into it through the inlet opening and pushed out through the outlet opening.

15 The sleeve is shaped in such a way as to surround the group of cigarettes on four sides. Preferably, the group of cigarettes, when it is inserted into the sleeve, is compressed transversely (the single cigarettes are compressed radially) and fits snugly in the sleeve, so that a transverse cross section of the internal passage defined by the sleeve is (slightly)
20 smaller in area than the transverse cross section of the group of cigarettes.

Preferably, the reinforcing blank is folded onto the sleeve in such a way that the bottom wall of the blank is placed on, and closes, the outlet opening of the sleeve.

25 Preferably, therefore, the reinforcing blank is formed on the sleeve in such a way that the inside surface of the reinforcing blank is in contact with the outside surface of the sleeve.

Preferably, the reinforcing blank is pre-formed on the sleeve, that is to say, it is formed before the sleeve receives the group of cigarettes. This
30 speeds up production.

Thus, in an example embodiment, a plurality of sleeves move in succession along a respective feed path. Simultaneously, a corresponding plurality of pockets move along a respective feed path (defined by the conveyor the pockets are fixed to).

5 As they move, the pockets receive inside them the groups of cigarettes (more specifically, the cigarettes are progressively withdrawn from the hoppers and inserted into the pockets).

As the sleeves move, a reinforcing element is placed round the outside of each; in effect, each reinforcing blank is progressively folded using the
10 outside surface of the sleeve as a form.

In a possible example embodiment, in a transfer station along the feed path, the pocket is aligned with a corresponding sleeve; in a corresponding transfer step, the group of cigarettes is transferred from the pocket to the corresponding sleeve aligned therewith; the transfer is
15 carried out by means of an extractor which acts on the first end of the group of cigarettes.

In an extracting step, the group of cigarettes is moved along the inside of the sleeve until it comes out through the outlet opening of the sleeve itself, thus intercepting the inside surface of the bottom wall of the
20 reinforcing element (more specifically, the bottom wall of the reinforcing element is intercepted by the second end of the group of cigarettes).

Thus, by coming out of the sleeve longitudinally, the group of cigarettes drags the reinforcing element along with it away from the sleeve in such a way that the reinforcing element remains coupled round the outside of the
25 group of cigarettes, forming an article made up of the group of cigarettes and the respective reinforcing element coupled thereto.

Preferably, the step of extracting the group of cigarettes from the sleeve occurs after the step of transferring the group from the pocket to the sleeve; preferably, an interval of time elapses between the step of
30 transferring the group from the pocket to the sleeve and the step of

extracting the group of cigarettes from the sleeve.

Preferably, the step of transferring the group from the pocket to the sleeve and the step of extracting the group of cigarettes from the sleeve are carried out in two different stations.

5 Preferably, the step of extracting the group of cigarettes from the sleeve is carried out using a pusher element different from the extractor element used to transfer the group from the pocket to the sleeve. This avoids having to make the stroke of the extractor element excessively long, which would slow down the production process. Preferably, the pusher element
10 is a plunger-like pusher element; preferably, the pusher element acts on the first end of the group of cigarettes and moves longitudinally (with reciprocating motion).

In one possible example embodiment, the sleeves are defined by an end portion of the pockets themselves at the end opposite the end where the
15 cigarettes are transferred from the hoppers to form the group.

Thus, the sleeves and the pockets might be defined by the same elements, with the advantage of simplifying the machine; or they might be distinct elements; the second solution allows defining a path for the sleeves which is independent of, and distinct from, the path of the
20 pockets.

Brief description of the drawings

This and other features of the invention will become more apparent from the following description of a preferred embodiment of it, illustrated by
25 way of non-limiting example in the accompanying drawings, in which:

- Figure 1 schematically illustrates a packing machine according to this description;
- Figure 2A shows a part of the machine 100 comprising a first and a second wrapping section;
- 30 - Figure 2AA is an enlarged view of a detail from Figure 2A;

- Figure 2B shows a variant embodiment of a part of the machine 100 of Figure 2A;
- Figure 2BB is an enlarged view of a detail from Figure 2B;
- Figure 3A shows a packet of the type with sharp edges, according to this description;
- Figure 3B shows an octagonal packet, according to this description;
- Figure 4 shows a group of cigarettes;
- Figure 5 shows a sealed wrapper round the group of cigarettes of Figure 4, for the packet of Figure 3A;
- Figure 6 shows a reinforcing element contained in the packet of Figure 3B;
- Figure 7 shows the reinforcing element of Figure 6 applied to the group cigarettes of Figure 4;
- Figure 8 shows a reinforcing blank used to make a reinforcing element for the packet of Figure 3A;
- Figure 9 shows a reinforcing blank used to make a reinforcing element for the packet of Figure 3B;
- Figure 10A shows a variant embodiment of the reinforcing blank of Figure 8;
- Figure 10B shows a variant embodiment of the reinforcing blank of Figure 9.

Detailed description of preferred embodiments of the invention

The numeral 1 in the accompanying drawings denotes a packet of smokable articles. More specifically, but not exclusively, the packet 1 is a packet of cigarettes 2.

Each cigarette 2 is elongate along a longitudinal axis and has a first end 201 and a second end 202. At the first and second ends 201 and 202, the cigarette 2 has surfaces which are transverse to the longitudinal axis. In an example embodiment, the cigarette 2 has a filter 203 at the second

end.

It should be noted that this description refers to cigarettes 2 but, more generally, applies to any smokable article which is elongate in shape along a longitudinal axis and which has a first and a second end (for example, a cigar).

For each packet 1, the cigarettes 2 are organized in a group 3 of cigarettes 2 aligned and oriented in the same way, which means the first ends 201 of all the cigarettes 2 of the group 3 are on the same side and all the second ends 202 are on the same side. Thus, a first end 301 of the group 3 of cigarettes and a second end of the group 3 of cigarettes 2 are defined.

The group 3 of cigarettes has a first zone 303 facing towards the first end 201 of the cigarettes 2, that is to say, facing towards the first end 301 of the group 3 of cigarettes 2; similarly, the group 3 of cigarettes has a second zone 304 facing towards the second end 202 of the cigarettes 2, that is to say, facing towards the second end 302 of the group 3 of cigarettes 2.

The first zone 303 and the second zone 304 of the group 3 of cigarettes 2 are offset, that is, longitudinally spaced from each other (along the longitudinal direction in which the cigarettes 2 are oriented).

The packet 1 has a sealed wrapper 4 which encloses the group 3 of cigarettes 2.

The sealed wrapper 4 is made from a film 401. The film 401 is made of thermoplastic material; the film 401 is odour impermeable (that is, it constitutes a barrier preventing aromas and flavours from passing through).

The sealed wrapper 4 has an opening through which the cigarettes 2 can be taken out. The sealed wrapper 4 also has a sealing panel 402, applied to the opening of the sealed wrapper 4. The sealing panel 402 can be moved from a closed position to an open position and vice versa

repeatedly over time. A tab 403 having a portion without adhesive on it is fixed to a free end of the sealing panel 402 to facilitate gripping between the fingers.

The packet 1 also comprises a reinforcing element 5 made of thin cardboard or other similar material. The reinforcing element 5 is substantially a box-shaped body shaped in such a way as to fit round the group 3 of cigarettes 2.

The reinforcing element 5 is made from a reinforcing blank 6; the reinforcing blank 6 is planar in shape and is obtained from a sheet of paper or paperboard by blanking.

The reinforcing element 5 is positioned inside the sealed wrapper 4. The reinforcing element 5 (with an inside surface of it) is in contact with the group 3 of cigarettes. The reinforcing element 5 is placed around the group 3 of cigarettes 2 to at least partly surround it.

The reinforcing element 5 has a front wall 501, a rear wall 502, two side walls 503 and a bottom wall 504. The bottom wall 504 is in contact with the first end 301 of the group 3 of cigarettes 2, that is, with the first end 201 of the cigarettes 2.

The reinforcing element 5 is elongate along the longitudinal direction; in other words, the reinforcing element 5 is elongate along a direction which, operatively (when the reinforcing element 5 is coupled to the group 3 of cigarettes 2) is the same as the longitudinal direction along which the group 3 of cigarettes 2 extends.

Relative to the longitudinal direction, the reinforcing element 5 has a first end and a second end. The bottom wall 504 is located at the first end of the reinforcing element 5. At the second end of the reinforcing element, there is an opening 505 for taking out the cigarettes 2. To facilitate taking out the cigarettes 2, the front wall 501 of the reinforcing element is provided with a tapered indentation 506.

The reinforcing element 5 can be divided into a first portion 507 and a

second portion 508 which are offset along the longitudinal direction. The first portion 507 of the reinforcing element 5 is directed towards the first end of it, that is to say, towards the bottom wall 504; the second portion 508 of the reinforcing element 5 is directed towards the second end of it, that is to say, towards the opening 505.

The side walls 503 of the reinforcing element 5 are located in the second portion 508 of the reinforcing element 5; in the first portion 507, the reinforcing element 5 defines at least one side opening 509. Preferably, the reinforcing element 5 defines two side openings 509 in its first portion 508. In the embodiment (not illustrated) with only one side opening 509, the corresponding side wall 503 extends on the side opposite the side opening.

In the second portion 508 of the reinforcing element 5, the side walls 503 act in conjunction with the front wall 501 and with the rear wall 502 to form a section which is closed annularly on four sides to surround the second zone 304 of the group 3 of cigarettes 2, leaving uncovered the first end 301 of the self-same group 3 of cigarettes 2.

The bottom wall 504 of the reinforcing element 5 is joined to the front wall 501 and to the rear wall 502. In the example illustrated, the bottom wall 504 of the reinforcing element 5 is joined only to the front wall 501 and to the rear wall 502 because laterally it has two side openings 509.

Preferably, the front wall 501 of the reinforcing element 5 extends for the full longitudinal length of the cigarettes 2. Preferably, the rear wall 502 of the reinforcing element 5 extends for the full longitudinal length of the cigarettes 2.

Preferably, the side walls 503 of the reinforcing element 5 have the same longitudinal extension; consequently, the side openings 509 preferably have the same longitudinal extension.

Preferably, the ratio between the extension of the side walls 503 (or of the at least one side wall 503) and the total longitudinal extension of the

reinforcing element 5 is in the interval [0.3 - 0.6]; more preferably, this ratio is in the interval [0.4 - 0.5]; in the example illustrated, the ratio is approximately 0.47.

Each side wall 503 (or the at least one side wall 503) of the reinforcing
5 element 5 has a plurality of sides which are joined to each other along longitudinal fold lines 510. Of these sides, which make up the side wall 503, at least one is a main side 511A and at least one is a connecting side 511B. In the example illustrated, each side wall 503 has a main side 511A and a first and a second connecting side 511B, located on opposite
10 flanks of the main side 511A, which is thus interposed between the first and the second connecting side 511B.

In an example embodiment, the main side 511A is perpendicular to the front and rear walls 501, 502.

The connecting sides 511B are inclined to the main side 511A.

15 In an example embodiment, each connecting side 511B is joined along longitudinal edges, that is, along respective longitudinal fold lines 510, to the corresponding main side 511A and to the front wall 501 or to the rear wall 502.

Preferably, the main sides 511A of the opposite side walls 503 are
20 parallel to each other and are at a distance which defines the maximum (transverse) distance between the side walls 503 of the reinforcing element 5. It should be noted that this distance, that is to say, the maximum mutual distance between the side walls 503, is preferably greater than the maximum transverse extension of the front wall 501 and
25 of the rear wall 502.

The perimeter of the bottom wall 504 has two long sides 512A and two short sides 512B. The front wall 501 and the rear wall 502 are joined to the long sides 512A. The short sides 512B are perpendicular to the long sides 512A.

30 Preferably, the mutual distance between the short sides 512B is greater

than the maximum transverse extension of the front wall 501 and of the rear wall 502; that is to say, the mutual distance between the short sides 512B is greater than the length of the long sides 512A of the base wall 504 of the reinforcing element 5. Preferably, the mutual distance between the short sides 512B is equal to the maximum distance between the side walls 503 (that is, between the main sides 511A of the side walls 503).

In the example illustrated, the perimeter of the base wall 504 is octagonal. The rear wall 502 of the reinforcing element 5 has a transverse edge 513 which contributes to delimiting the opening 505 used to take out the cigarettes 2. Preferably, the transverse edge 513 of the rear wall 502 has the shape of an arc whose concavity faces towards the outside of the reinforcing element 5.

In the second zone 304 of the group of cigarettes, that is, in the second portion 508 of the reinforcing element 5, the reinforcing element 5 has joining points made by means of adhesive material, for example hot-melt glue.

The joining points, not illustrated in the drawings, are located on overlapping flaps of the reinforcing element 5.

In an example embodiment, the joining points are located on the side walls 503. Preferably, the joining points are located only on the side walls 503. Alternatively or in addition to the joining points on the side walls 503, joining points might also be located on the front wall 501 or on the rear wall 502.

The joining points may be located at distinct positions, spaced from each other, in succession (for example along a longitudinal trajectory) or along uninterrupted strips (for example oriented longitudinally).

To better understand how different flaps of the reinforcing element 5 are joined to each other, it is useful, to describe the method for making the reinforcing element 5, in the context of a method for making a packet 1 of cigarettes 2 (or other smokable articles having a first and a second end

and being elongate along a longitudinal direction).

The reinforcing element 5 is made by folding and closing the reinforcing blank 6.

5 The reinforcing blank 6 has a front panel 601 and a rear panel 602. The reinforcing blank 6 also has at least a first lateral wing 603A and a second lateral wing 603B joined to the front panel 601 along corresponding longitudinal fold lines 602.

The reinforcing blank 6 also has a base 604. The base 604 has two long sides 605A and two short sides 605B.

10 The front panel 601 and the rear panel 602 are joined to respective long sides 605A of the base 604 along fold lines 606.

The lateral wings 603A, 603B are joined to the front panel 601 or to the rear panel 602 along corresponding longitudinal fold lines 607. The front panel 601 and the rear panel 602 are substantially rectangular in shape
15 and each has lateral edges.

The longitudinal fold lines 607 are located along a stretch of the lateral edges of the front panel 601, or of the rear panel 602, which is longitudinally spaced from the base 604. More specifically, the longitudinal fold lines 607 are located along a stretch of the lateral edges
20 of the front panel 601, or of the rear panel 602, which is situated at the end of the front panel 601 or rear panel 602 opposite to the base 604.

Operatively, the base 604 of the reinforcing blank 6 is in contact with the first end 301 of the group of cigarettes 2 to form the bottom wall 504 of the reinforcing element 5. The front panel 601 and the rear panel 602 are
25 placed in contact with the group 3 of cigarettes on opposite, parallel surfaces thereof to form the front wall 501 and the rear wall 502 of the reinforcing element, respectively.

The first and second lateral wings 603A, 603B are folded along the respective longitudinal fold lines 607 to form the side walls 503 of the
30 reinforcing element 5.

In an example embodiment, the reinforcing blank 6 also has a third lateral wing 603C and a fourth lateral wing 603D. The first and second lateral wings 603A, 603B are joined to the front panel 601, whilst the third and fourth lateral wings 603C, 603D are joined to the front panel 601.

5 All the lateral wings 603A, 603B, 603C, 603D are joined to the respective front or rear panel 601, 602 along a corresponding longitudinal fold line 607 located along a stretch of the corresponding lateral edge of the panel which is longitudinally spaced from the base 604, that is to say, which is distal from the base 604.

10 Operatively, the first and third lateral wings 603A, 603C at least partially overlap and contribute to forming a corresponding side wall 503 of the reinforcing element 5; similarly, the second and fourth lateral wings 603B, 603D at least partially overlap and contribute to forming the other corresponding side wall 503 of the reinforcing element 5.

15 In this case, to close the reinforcing blank 6 to form the reinforcing element 5, adhesive material (hot-melt glue) is applied at joining points located in the overlapping zone between the first and third wings 603A, 603C and in the corresponding overlapping zone between the second and fourth wings 603B, 603D.

20 In another example embodiment, only the first and the second lateral wings 603A, 603B are present and are joined to the front panel 601 or to the rear panel 602 on opposite sides; in such case, the transverse extension of the lateral wings 603A, 603B is greater than the length of the small side 604B of the base 604, so as to enable the lateral wing, joined
25 to one of either the front panel 601 or the rear panel 602 to overlap the other of either the front panel 601 or the rear panel 602 in an overlapping zone; in such case, the joining points where the adhesive material is applied are located in this overlapping surface.

It should be noted that in the case where there are only two lateral wings,
30 these are preferably joined to the same panel, that is, both of the lateral

wings are joined either to the front panel 601 or to the rear panel 602; in a possible variant embodiment not illustrated, one of either the first or the second lateral wing 603A, 603B might, however, be joined to the front panel 601 and the other to the rear panel 602, on opposite sides.

5 In an example embodiment (irrespective of the number of lateral wings, in particular in the case of octagonal packets), each lateral wing 603A, 603B, 603C, 603D of the reinforcing blank 6 has at least a first segment and a second segment joined to each other along a longitudinal fold line 608. In other words, each lateral wing 603A, 603B, 603C, 603D is broken
10 by, that is to say, intersected by, one or more longitudinal fold lines 608, which divide the lateral wing into two or more segments which can be inclined to each other by folding.

In another example embodiment relating in particular to octagonal packets (irrespective of the number of lateral wings), the short sides 605B of the
15 base 604 of the reinforcing blank 6 are preferably spaced by a quantity greater than the transverse width of the front and rear panels 601, 602; the base 604 thus has side portions which project sideways in cantilever fashion from the lateral edges defined by the stretches of the front and rear panels 601, 602 directed towards the base 604.

20 In the case of a packet with sharp-edges, the short sides 605B are spaced by a quantity equal to the transverse width of the front and rear panels 601, 602.

Operatively, these segments of the lateral wings 603A, 603B, 603C, 603D define, for each side wall 503 of the reinforcing element 5, the main side
25 511A (positioned perpendicularly to the front and rear walls) and the connecting sides 511B which are inclined to the main side 511A and to the corresponding front wall 501 or rear wall 502 of the reinforcing element 5.

It should also be noted that the front panel 601 has, at the end of it
30 opposite the base 604, a tapered indentation 609 (trapezoidal in shape) to

define the tapered indentation 506 of the front wall 501 of the reinforcing element 5.

It should also be noted that the rear panel 602 has, at the end of it opposite the base 604, an arcuate (sunken) profile 610 whose concavity
5 faces outwards in the direction opposite to the base 604 to define the arcuate transverse edge 513 of the front wall 501 of the reinforcing element 5.

This description also relates to a packing machine 100. The packing machine 100 is designed to pack in the packet 1 the group 3 of cigarettes
10 2 or other smokable articles having a first and a second end, and being elongate in shape along a longitudinal direction.

The packing machine 100 has a first wrapping section 7 and a second wrapping section 8; the packing machine 100 preferably also has a third wrapping section 9.

15 The first wrapping section 7 receives reinforcing blanks 6 (for example piled one on top of the other in stacks) and the cigarettes 2 (for example, loose cigarettes from a machine which makes cigarettes 2).

The first wrapping section 7 is configured to form the reinforcing elements 5 from flat reinforcing blanks 6.

20 The first wrapping section 7 is configured to couple the reinforcing elements 5 to corresponding groups 3 of cigarettes 2.

The first wrapping section 7 is preferably configured to form the groups 3 of cigarettes 2, for example by means of a hopper system 701 acting in conjunction with a conveyor 702 provided with a plurality of pockets 703.

25 A plurality of cigarettes 2, equal in number to that making up the group 3 (for example, 20 cigarettes 2) is extracted from the hoppers 701 and inserted into one of the pockets 703; inside the pocket 703, the plurality of cigarettes 2 is transported into a zone where an extractor element 704 operates.

30 The first wrapping section 7 preferably comprises a plurality of sleeves

705 (mandrels) designed to receive the groups 3 of cigarettes 2 from the corresponding pockets 703 under the action of the extractor element 704. Each sleeve 705 has an inlet and an outlet. The sleeve 705 has a (side) wall which is thin, for example two millimetres. The sleeve 705 has a rectangular or substantially rectangular cross section, equal or similar in size to that of the pocket 703, so as to precisely receive the group 3 of cigarettes 2 fed longitudinally through the inlet of the sleeve 705 in the direction of the outlet of the sleeve 705 itself.

The group 3 of cigarettes is fed into the sleeve 705 until the first end 301 of the group of cigarettes 2 (that is, the first ends 201 without filters 203) is flush with the outlet of the pocket 705.

In an example embodiment, the sleeves 705 and the pockets 703 are defined, respectively, by a first and a second stretch of the same elements connected to the conveyor 702 whose longitudinal extension is greater than the total length of a cigarette 2. In this case, the cigarettes 2 are inserted into the first stretch of the element, constituting the pocket 703, whilst a reinforcing blank 6 is coupled to the second stretch of the element, constituting the sleeve 705.

In another example embodiment, the sleeves 705 are elements distinct from the pockets 703; in such case, the sleeves 705 are preferably connected to a specific conveyor of their own to be moved along a specific path.

In such case (where the sleeves 705 and the pockets 703 are distinct and each is movable along a specific feed path), the first wrapping section 7 preferably comprises one or more centring elements (not illustrated) designed to handle the reinforcing blanks 6 in such a way as to align the base 604 of the reinforcing blank 6 with the outlet of the sleeve 705 so that the outlet end of the sleeve 705 comes into abutment with the base 604 of the reinforcing blank 6.

The first wrapping section 7 preferably comprises a folding unit (not

illustrated) designed to fold the reinforcing blank 6 onto the outside surface of the sleeve 705 (or onto a portion thereof).

In an example embodiment, the folding unit has first folding elements configured to fold the front panel 601 and the rear panel 602 of the reinforcing blank 6 into direct contact with corresponding outside surfaces of the sleeve 705 and thus into indirect contact with the group 3 of cigarettes 2, which is in contact with corresponding inside surfaces of the sleeve 705.

Similarly, the folding unit has second folding elements for folding the lateral wings 603A, 603B, 603C, 603D of the reinforcing blank 6 about corresponding fold lines 607 into direct contact with corresponding outside surfaces of the sleeve 705 and thus into indirect contact with the group 3 of cigarettes 2, which is in contact with corresponding inside surfaces of the sleeve 705.

The first wrapping section 7 preferably also comprises gluing elements (not illustrated, comprising for example hot-melt glue dispensing nozzles) configured to apply adhesive material to at least one surface of the reinforcing blank 6 (for example on a surface of the lateral wings) to permanently join the front and rear panels 601, 602 of the reinforcing blank 6 by means of the lateral wings 603A, 603B, 603C, 603D in the first zone 303 of the group 3 of cigarettes 2.

Preferably, the pocket 705 has a longitudinal extension which is greater than the (longitudinal) length of the cigarettes 2, that is to say, greater than the total (longitudinal) length of the reinforcing element 5, that is, of the front and rear panels 601, 602 of the reinforcing blank. This allows the sleeve 705 to be held in position while the reinforcing blank 6 is folded onto a stretch (which occupies all four sides and surrounds the group 3 of cigarettes 2) of the outside surface of the sleeve itself.

The first wrapping section 7 preferably also comprises pusher elements (not illustrated) configured to push the group 3 of cigarettes longitudinally

in a direction from the second end 302 to the first end 301 of the group 3 of cigarettes 2 by pressing against the second end 302. During the pushing action, the sleeve 705 is held longitudinally in place or is moved in the opposite direction relative to the group 3 of cigarettes 2.

5 That way, the group 3 of cigarettes is extracted from the sleeve 705 remaining with its first end 301 in contact with the base 604 of the reinforcing blank 6, that is, with the bottom wall 504 of the reinforcing element 5 and coming progressively into contact with the front and rear panels 601, 602 and with the lateral wings 603 of the reinforcing blank 6,
10 that is, with the front and rear walls 501, 502 and the side walls 503 of the reinforcing element 5.

Thus, at its outfeed end, the first wrapping section 7 delivers a succession of (individual) articles, each made up of a group 3 of cigarettes with a corresponding reinforcing element 5 coupled to the outside of it.

15 The second wrapping section 8 is preferably of the flow-pack type, based on technology which is known to experts in the trade and which is therefore not described in detail and is illustrated only schematically.

The second wrapping section 8 receives the succession of articles made up of groups of cigarettes with the reinforcing elements coupled thereto
20 and is configured to enclose the individual articles in respective sealed wrappers 4 made from a film 801 of thermoplastic material.

At its outfeed end, the second wrapping section 8 delivers the cigarette groups 3 individually wrapped in a sealed wrapper 4 containing the reinforcing element 5 inside it.

25 The third wrapping section 9 is configured to make an outer case 11 around the sealed wrapper. For example, the third wrapping section 9 is configured to make a rigid, box-shaped body containing the sealed wrapper 4 and provided with a lid 12 hinged to the box-shaped body itself. The third wrapping section 9 uses technology known in the trade and is
30 not described further.

This description also provides a method for making a packet 1 of cigarettes 2 or other smokable articles having a first and a second end, and being elongate in shape along a longitudinal direction.

5 The method comprises a step of preparing a reinforcing blank 6, preferably made according to one or more of the features described above, and forming the reinforcing element 5 from the reinforcing blank 6.

The method also comprises coupling the reinforcing element 5 (already formed or after or during its formation) to the cigarette group 3 in order to completely surround a second zone 303 of its lateral surface and to cover
10 at least its first end 301 (and preferably also the large rectangular outside surfaces of the group 3 of cigarettes 2).

The method also comprises making a sealed wrapper 4 containing the group 3 of cigarettes and the reinforcing element 5 coupled thereto by means of the film 801 of thermoplastic material having the extraction
15 opening for taking out the cigarettes and closed by a the sealing panel 402.

CLAIMS

1. A packet (1) of cigarettes (2) or other smokable articles, each having a first and a second end (201, 202), elongate in shape and extending along a longitudinal direction, comprising:
- a group (3) of cigarettes having a first zone (303), facing towards the first end of the cigarettes (2), and a second zone (304), longitudinally spaced from the first zone (303) and facing towards the second end of the cigarettes (2);
 - a sealed wrapper (4) enclosing the group (3) of cigarettes, made from a film (401) of thermoplastic material and having an extraction opening through which the cigarettes (2) can be taken out;
 - a sealing panel (402) applied to the opening of the sealed wrapper (4);
- a reinforcing element (5), made of thin cardboard, located inside the sealed wrapper (4) in contact with the group (3) of cigarettes to surround it at least partly, and having a front wall (501), a rear wall (502), two side walls (503) and a bottom wall (504) in contact with the first end (201) of the cigarettes (2),
- characterized in that the reinforcing element (5), in the second zone (304) of the group (3) of cigarettes, annularly surrounds the group (3) of cigarettes and, in the first zone (303) of the group (3) of cigarettes, defines side openings (509).
2. The packet (1) according to claim 1, wherein the bottom wall (504) of the reinforcing element (5) is joined only to the front wall (501) and to the rear wall (502) of the reinforcing element (5) itself.
3. The packet (1) according to claim 1 or 2, wherein the front wall (501) and the rear wall (502) of the reinforcing element (5) extend for the full longitudinal extension of the cigarettes (2), wherein the front wall (501) has a tapered indentation (506) to facilitate taking out the cigarettes (2) and positioned in the second zone (304) of the group (3) of cigarettes.

4. The packet (1) according to any one of the preceding claims, wherein the side openings (509) of the reinforcing element (5) extend for at least half of a total longitudinal extension of the reinforcing element (5).

5. The packet (1) according to any one of the preceding claims, wherein the reinforcing element (5), in the second zone (304) of the group (3) of cigarettes has joining points made by means of adhesive material.

6. The packet (1) according to claim 5, wherein the joining points are located on the side walls (503).

7. The packet (1) according to claim 5 or 6, wherein the joining points are located on the front wall (501) or on the rear wall (502).

8. The packet (1) according to any one of the preceding claims, wherein each side wall (503) of the reinforcing element (5) has a main face (511A), positioned perpendicularly to the front wall (501) and to the rear wall (502), and a first and a second connecting face (511B) inclined at an angle to the main face (511A), wherein the first and second connecting faces (511B) are each joined along longitudinal edges to the corresponding main face (511A) and to the front wall (501) or to the rear wall (502).

9. The packet (1) according to any one of the preceding claims, wherein the side walls (503) of the reinforcing element (5) are positioned at a maximum distance from each other which is greater than a maximum transverse extension of the front wall (501) and of the rear wall (502).

10. A method for making a packet (1) of cigarettes (2) or other smokable articles, each having a first and a second end (201, 202), being elongate in shape and extending along a longitudinal direction, comprising the following steps:

- preparing a reinforcing blank (6) made of thin, flexible cardboard to form a reinforcing element (5);

- coupling the reinforcing element (5) to a group (3) of cigarettes to surround it at least partly, where a bottom wall (504) of the reinforcing element (5) is in contact with the first end (201) of the cigarettes (2);

5 - making, by means of a film (401) of thermoplastic material having an extraction opening for taking out the cigarettes (2) and closed by a sealing panel (402), a sealed wrapper (4) containing the group (3) of cigarettes and the reinforcing element (5) coupled thereto,

characterized in that the reinforcing element (5) is coupled to the group (3) of cigarettes in such a way as to surround it annularly in a second zone (304) of the group (3) of cigarettes, facing towards the second end (202) of the cigarettes (2), and so as to leave it uncovered at the side openings (509) of the reinforcing element (5) itself in a first zone (303) of the group (3) of cigarettes, facing towards the first end (201) of the cigarettes (2).

10 11. The method according to claim 10, wherein the reinforcing blank (6) has:

- a base (604) having two short sides (605B) and two long sides (605A);
- a front panel (601) and a rear panel (602) joined to respective long sides (605A) of the base (604) along fold lines (606);

20 - at least a first and a second lateral wing (603A, 603B) joined to the front panel (601) or to the rear panel (602) along corresponding longitudinal fold lines (607) positioned on the front panel (601) or rear panel (602) in a stretch of lateral edges thereof which is spaced longitudinally from the base (604),

25 and wherein, in coupling the reinforcing element (5) to the group (3) of cigarettes:

- the base (604) of the blank (6) is placed in contact with the first ends (201) of the cigarettes (2) to form a bottom wall (504) of the reinforcing element (5);

- the front panel (601) and the rear panel (602) are placed in contact with the group (3) of cigarettes on opposite, parallel surfaces thereof to form a front wall (501) and a rear wall (502) of the reinforcing element (5), respectively;

- 5 - the at least one first and second lateral wing (603A, 603B) are folded along the respective longitudinal fold lines (607) to form side walls (503) of the reinforcing element (5) and to surround the group (3) of cigarettes annularly in the second zone (304) of the group (3) of cigarettes.

12. The method according to claim 11, comprising a step of applying
10 hot-melt glue to the at least one first and second lateral wings (603A, 603B) in order to close the reinforcing element (5) annularly around the second zone (304) of the group (3) of cigarettes.

13. The method according to claim 11 or 12, wherein the reinforcing blank (6) has:

- 15 - a first and a second lateral wing (603A, 603B) joined to the front panel (601) along corresponding longitudinal fold lines (607) positioned on the front panel (601) in a stretch of lateral edges thereof which is spaced longitudinally from the base (604);

- a third and a fourth lateral wing (603C, 603D) joined to the rear panel
20 (602) along corresponding longitudinal fold lines (607) positioned on the rear panel (602) in a stretch of lateral edges thereof which is spaced longitudinally from the base (604),

wherein the first and third wings (603A, 603C) are at least partly overlapped and together form a corresponding side wall of the side walls
25 (503) of the reinforcing element (5), and the second and fourth wings (603B, 603D) are at least partly overlapped and together form the other corresponding side wall of the side walls (503) of the reinforcing element (5).

14. The method according to any one of claims 11 to 13, wherein each
30 lateral wing of the reinforcing blank (6) has at least a first and a second

segment which are joined to each other along a longitudinal fold line (608) to define, for each side wall (503) of the reinforcing element (5), a main face (511A) of the reinforcing element (5), positioned perpendicularly to the front wall (501) and to the rear wall (502), and at least a first
5 connecting face (511B) inclined at an angle to the main face and joined along longitudinal edges to the corresponding main face (511A) and to the front wall (501) or to the rear wall (502) of the reinforcing element (5).

15. A packing machine (100) for packing in a packet (1) a group (3) of cigarettes (2) or other smokable articles, each having a first and a second
10 end (201, 202), being elongate in shape and extending along a longitudinal direction, comprising:

- a first wrapping section (7) designed to be fed with reinforcing blanks (6) made of thin cardboard and with cigarettes (2) and configured to form reinforcing elements (5) coupled to corresponding groups (3) of cigarettes
15 to at least partly surround them;

- a second wrapping section (8), of the flow-pack type, designed to be fed with a succession of articles consisting of the groups (3) of cigarettes coupled to the reinforcing elements (5) and configured to enclose the single articles in a sealed wrapper (4) made from a film (801) of
20 thermoplastic material and provided with an extraction opening through which the cigarettes (2) can be taken out and with sealing panel (402) applied to the sealed wrapper (4) itself;

- a third wrapping section (9) configured to make a rigid, box-shaped body (11) containing the sealed wrapper (4) and provided with a lid (12)
25 hinged to the box-shaped body (11) itself,

characterized in that the first wrapping section (7) comprises:

- a centring device configured to position a base of the reinforcing blank (6) in alignment with the first end (201) of the cigarettes (2) of the group (3) of cigarettes;

- a folding unit having first folder elements configured to fold a front panel (601) and a rear panel (602) of the reinforcing blank (6) into contact with the group (3) of cigarettes and second folder elements to fold at least a first and a second lateral wing (603A, 603B) of the reinforcing blank (6) about corresponding longitudinal fold lines (607);
- gluer elements configured to apply adhesive material to at least one surface of the lateral wings (603A, 603B) in order to stably join the front panel (601) and the rear panel (602) of the reinforcing blank (6) through the lateral wings (603A, 603B) in a second zone (304) of the group (3) of cigarettes, the second zone being spaced longitudinally from the base (604) of the reinforcing blank (6) and facing towards the second end (202) of the cigarettes (2) of the group (3) of cigarettes.

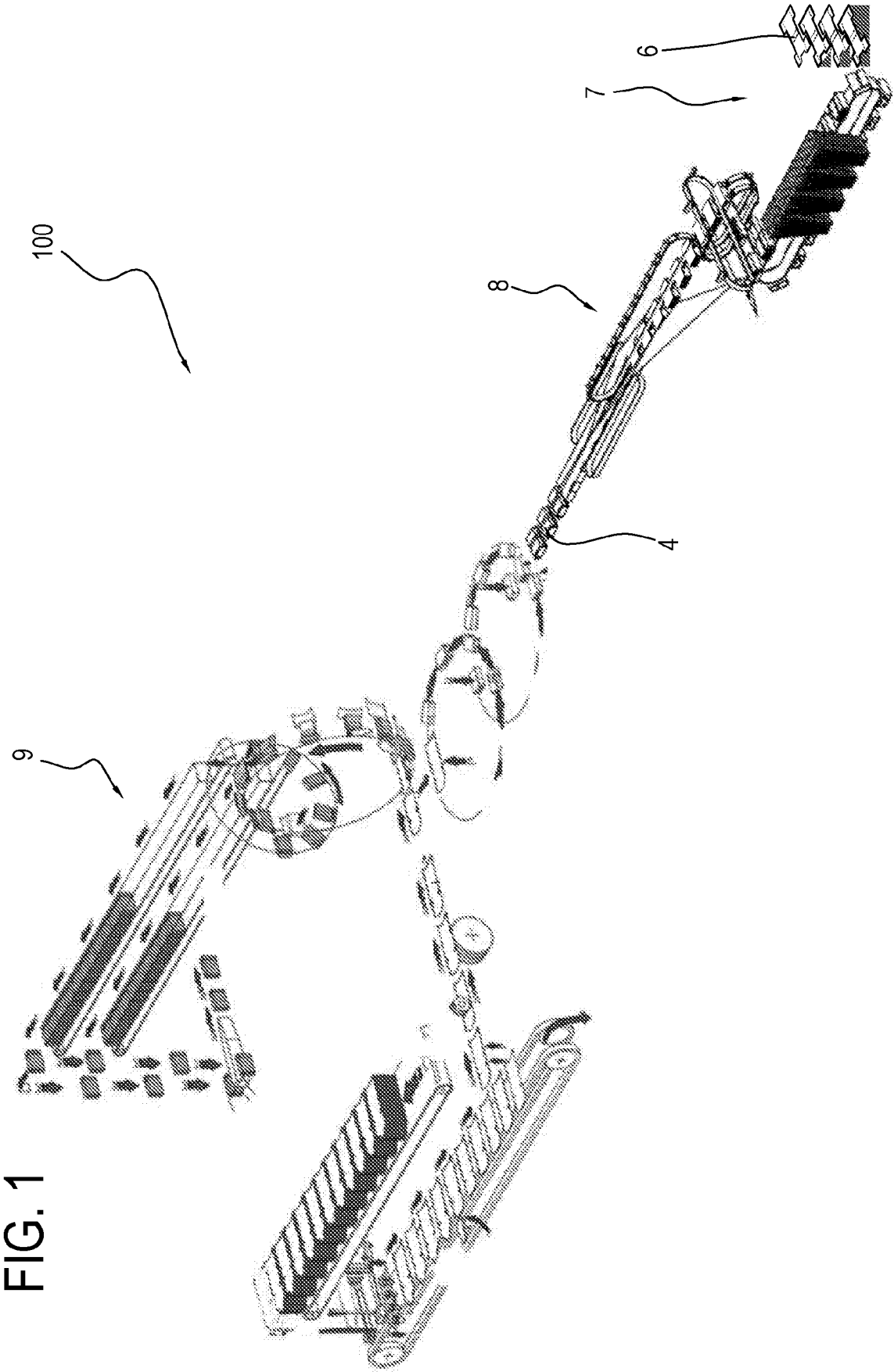


FIG. 2A

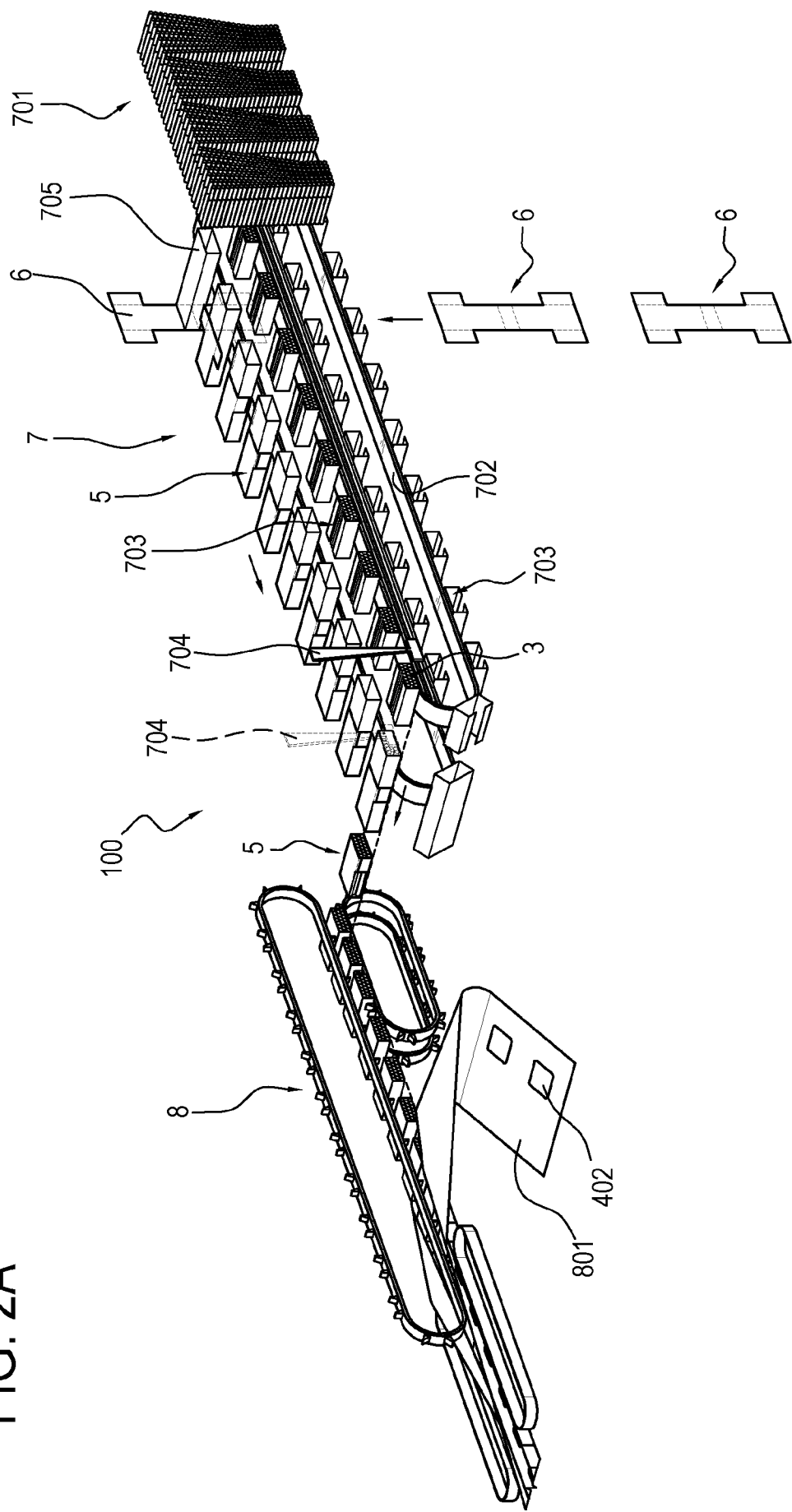


FIG. 2AA

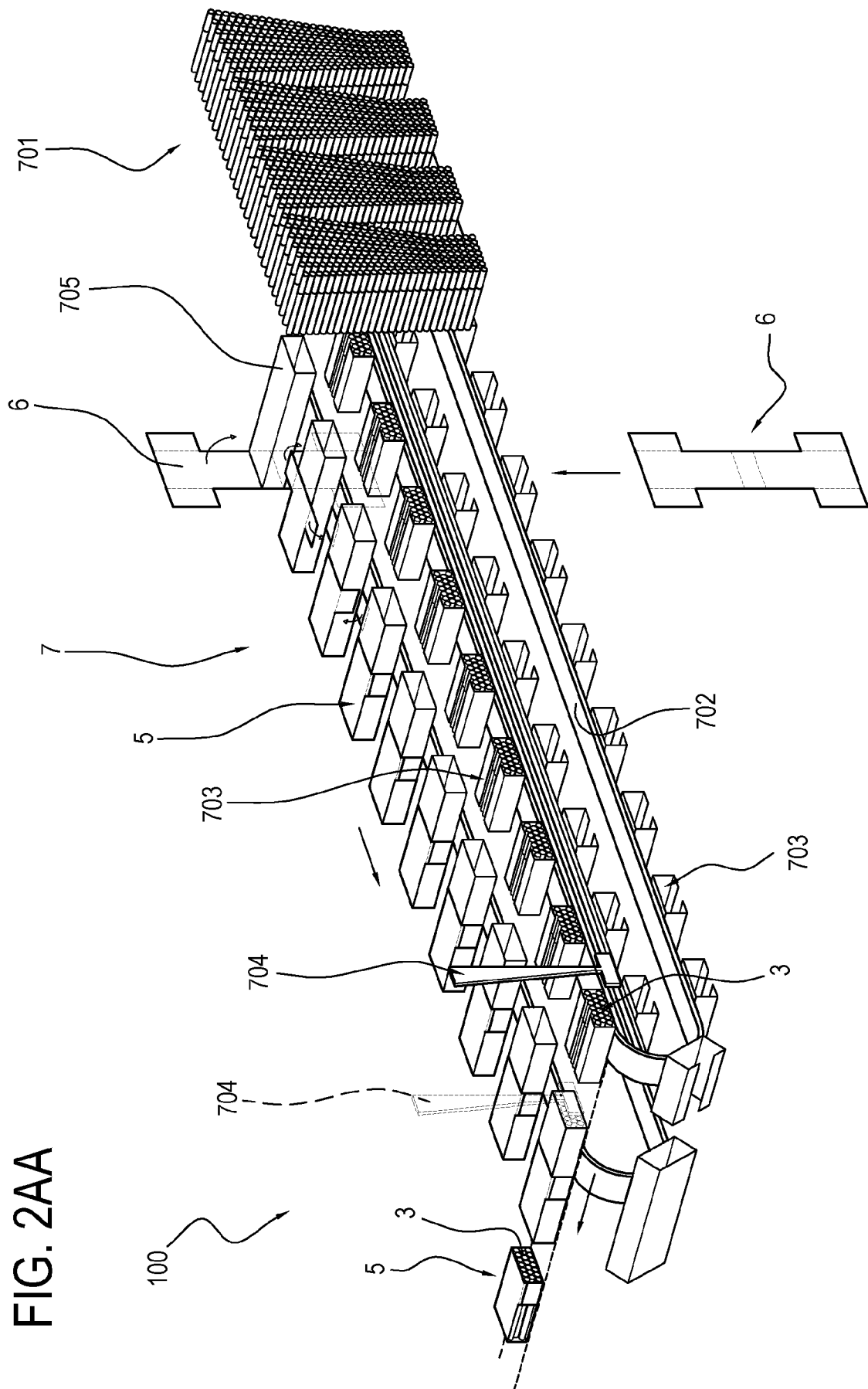


FIG. 2B

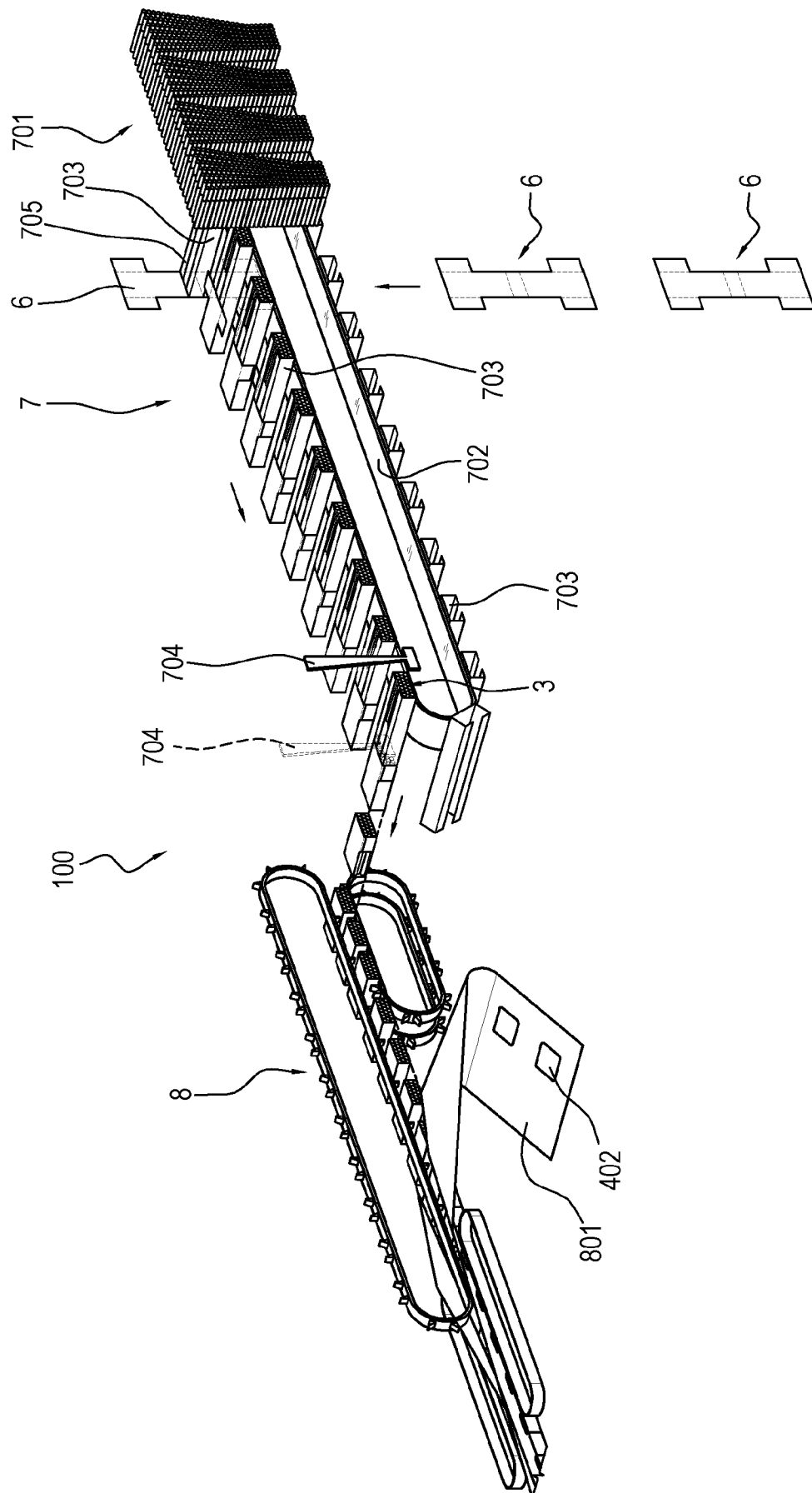


FIG. 2BB

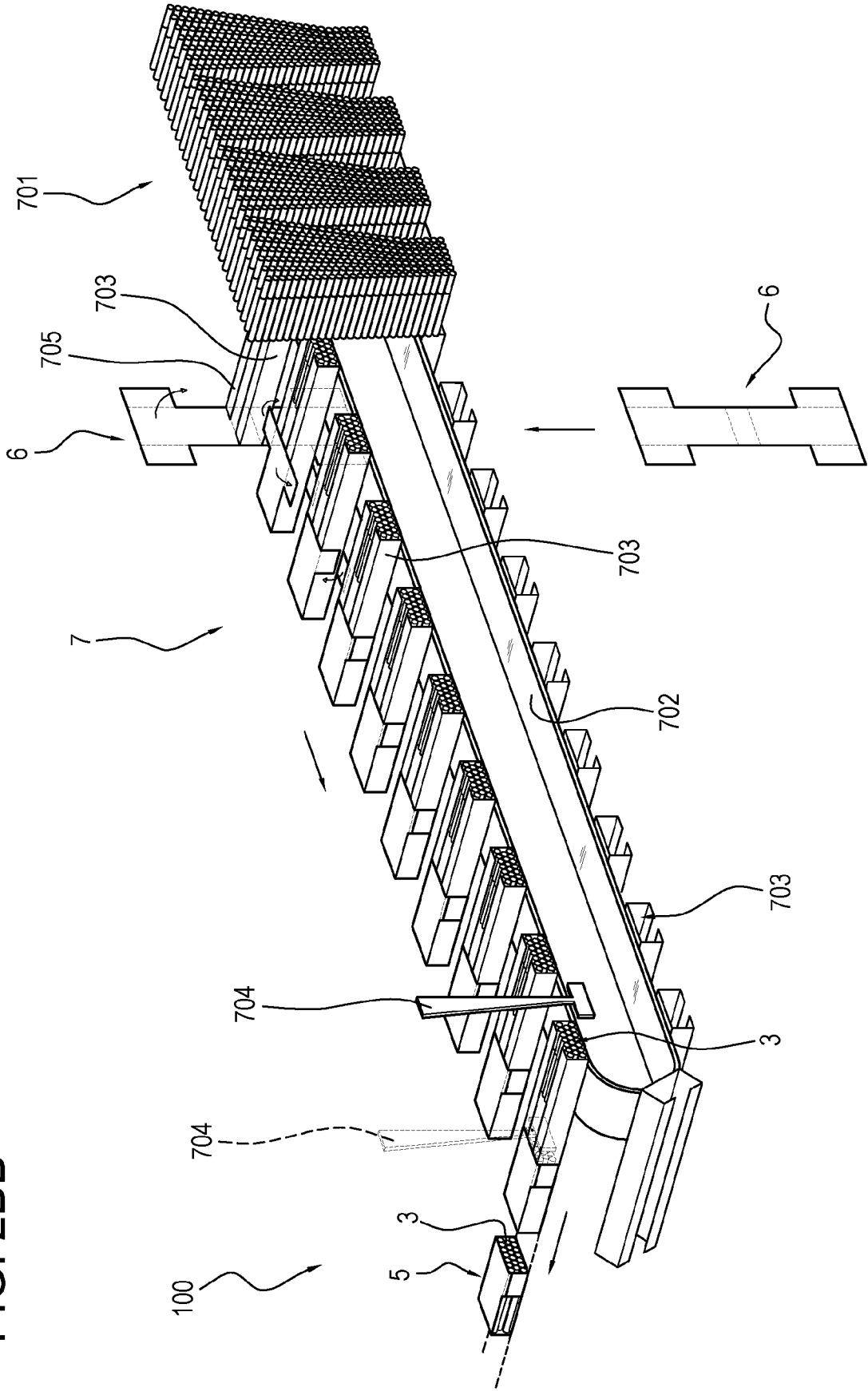


FIG. 3B

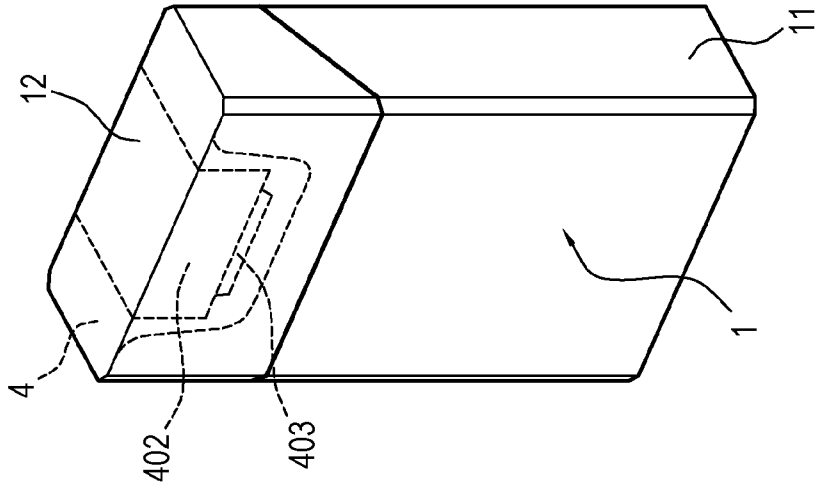


FIG. 3A

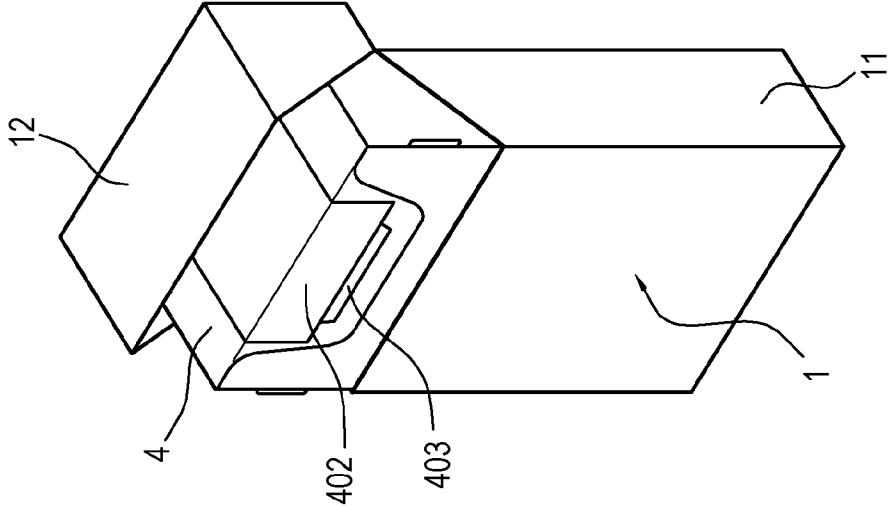


FIG. 4

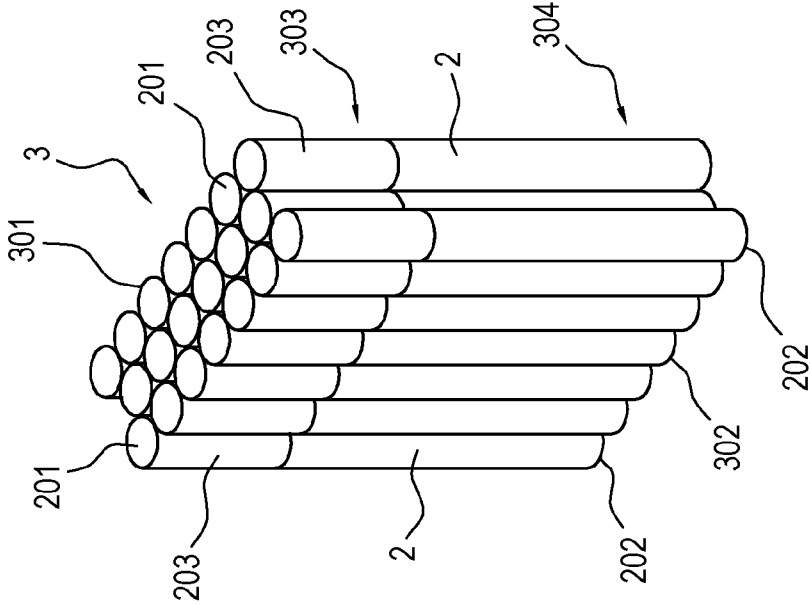


FIG. 5

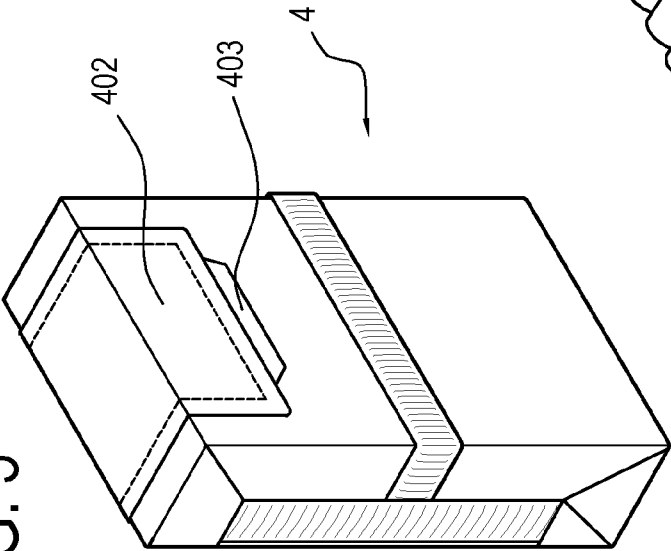


FIG. 6

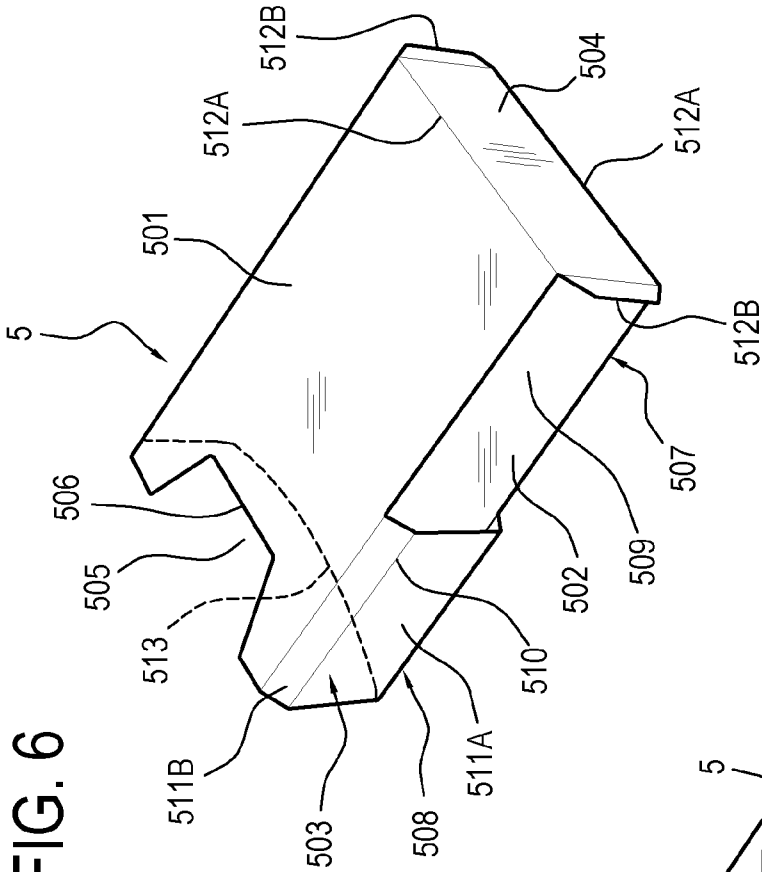
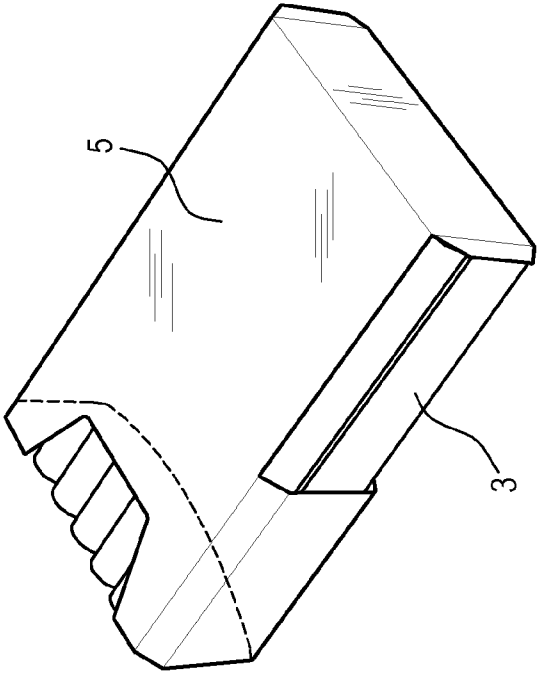


FIG. 7



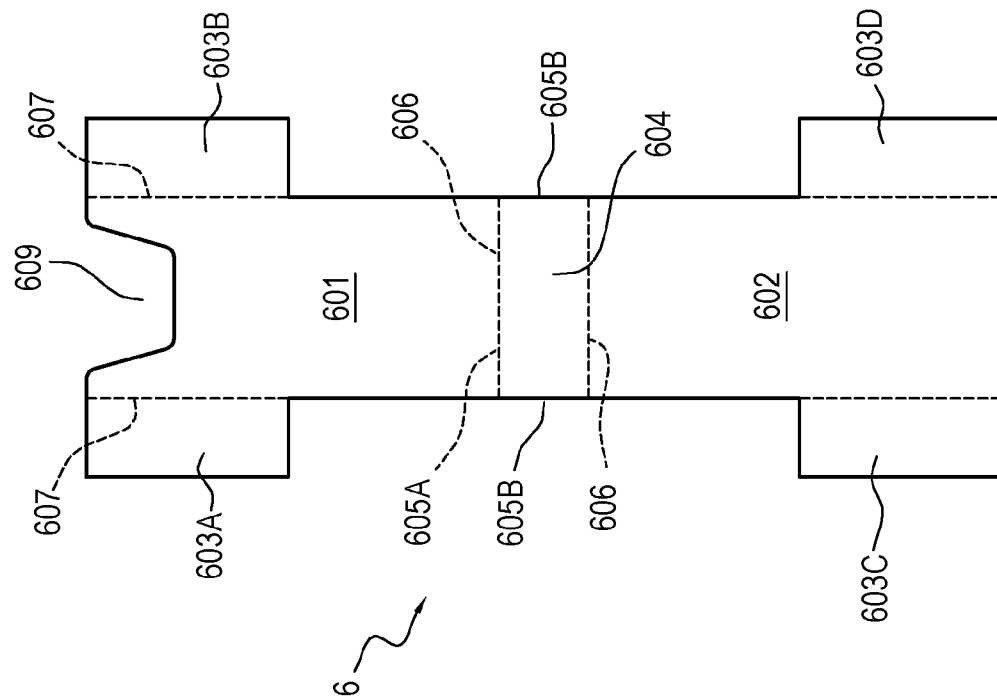
$$\frac{\infty}{F|G}$$


FIG. 9

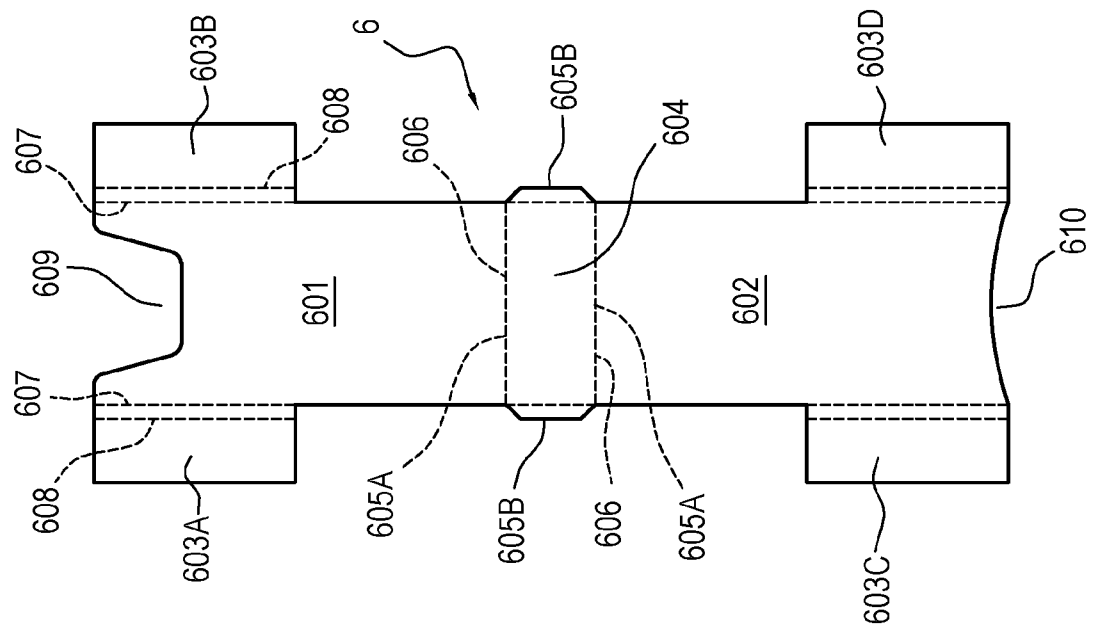


FIG. 10A

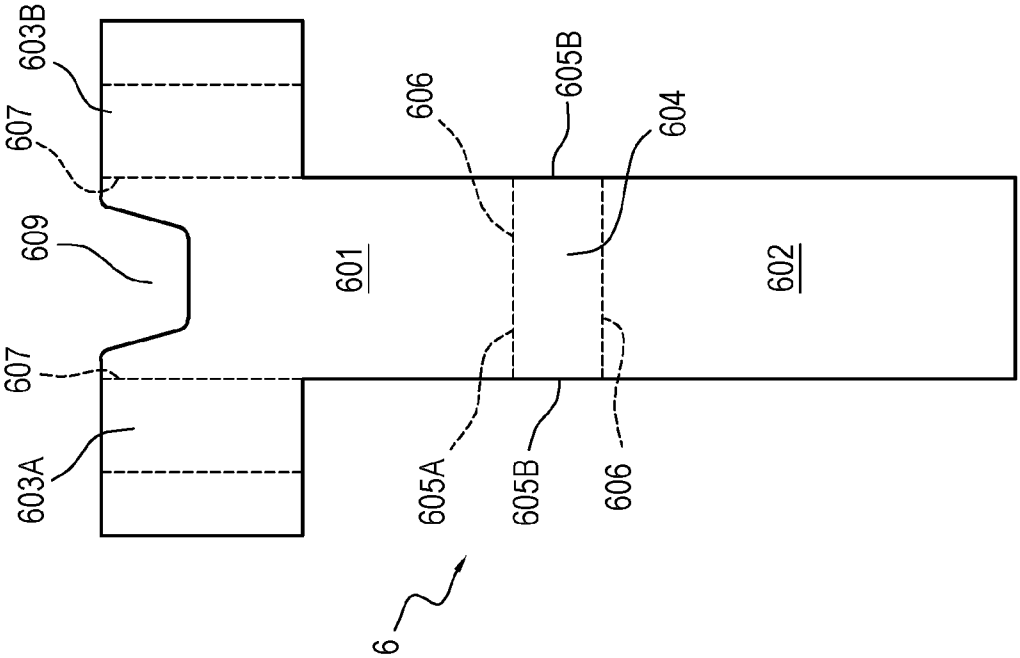
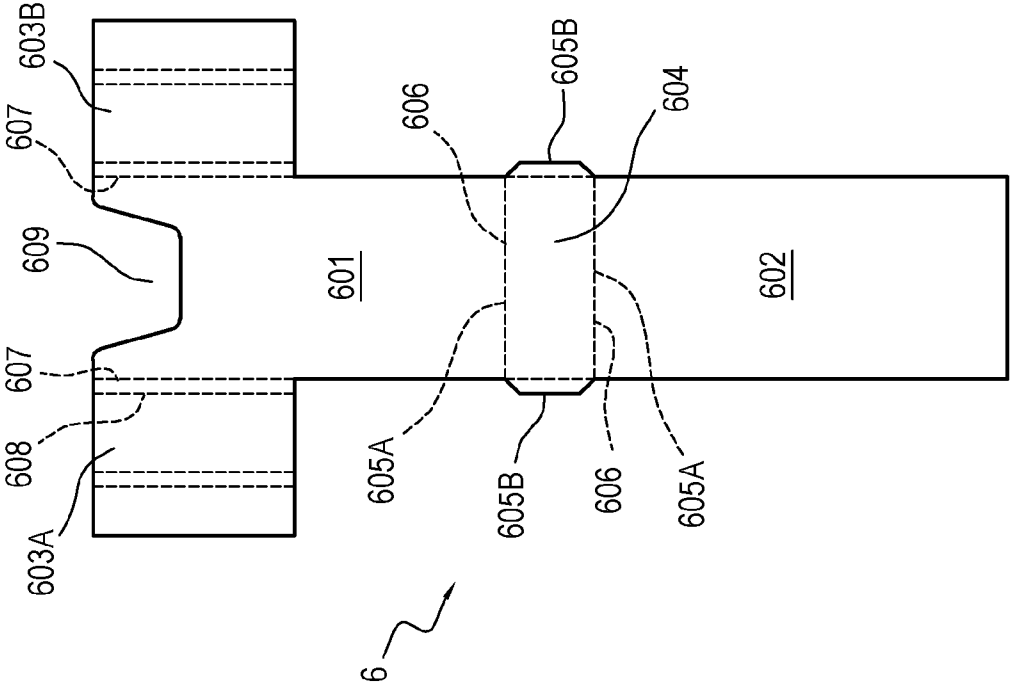


FIG. 10B



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2016/054504

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/10 B65D77/26 B65B19/02
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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2015/015399 A1 (GD SPA [IT]) 5 February 2015 (2015-02-05) page 3, line 12 - page 7, line 14 page 17, line 15 - line 17; figures 1,5,6 -----	1-14
Y	WO 2011/009520 A1 (FOCKE & CO [DE]; SCHOENBERGER HANS [DE]; BUSE HENRY [DE]) 27 January 2011 (2011-01-27) page 4, line 27 - page 5, line 9; figures 5,6 -----	1-14
Y	EP 2 138 411 A1 (GD SPA [IT]) 30 December 2009 (2009-12-30) paragraph [0034]; figure 5 -----	1-15
Y	EP 2 832 663 A1 (FOCKE & CO [DE]) 4 February 2015 (2015-02-04) paragraph [0023]; figure 11 ----- -/--	3,12



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

30 November 2016

Date of mailing of the international search report

12/12/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
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Authorized officer

Vesterholm, Mika

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2016/054504

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.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2016/054504

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	W0 2014/013479 A2 (GD SPA [IT]) 23 January 2014 (2014-01-23) cited in the application page 13, line 19 - page 14, line 9; figure 32 -----	15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2016/054504

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015015399 A1	05-02-2015	NONE	

WO 2011009520 A1	27-01-2011	DE 102009034705 A1	27-01-2011
		EP 2456685 A1	30-05-2012
		EP 2993143 A1	09-03-2016
		WO 2011009520 A1	27-01-2011

EP 2138411 A1	30-12-2009	AT 541789 T	15-02-2012
		CN 201580702 U	15-09-2010
		EP 2138411 A1	30-12-2009
		JP 5607318 B2	15-10-2014
		JP 2010006476 A	14-01-2010
		US 2009321437 A1	31-12-2009

EP 2832663 A1	04-02-2015	DE 102013012715 A1	05-02-2015
		EP 2832663 A1	04-02-2015

WO 2014013479 A2	23-01-2014	EP 2874909 A2	27-05-2015
		JP 2015523289 A	13-08-2015
		KR 20150031416 A	24-03-2015
		WO 2014013479 A2	23-01-2014

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, 2, 4, 8-11, 13, 14

How to support cigarettes sideways in a reinforcing element

2. claim: 3

How to facilitate taking out of the cigarettes from the packet

3. claims: 5-7, 12

How to join parts of a reinforcing element together

4. claim: 15

How to form a packet of a group of cigarettes
