

TOBACCO UNIT, APPARATUS AND METHOD FOR PRODUCING THE TOBACCO UNIT

TECHNICAL FIELD

- 5 **[0001]** The present disclosure relates to a tobacco unit, an apparatus and a method for producing the same.

BACKGROUND

- 10 **[0002]** The following discussion of the background is intended to facilitate understanding of the present disclosure. However, it should be appreciated that the discussion is not an acknowledgment or admission that any of the material referred to was published, known or a part of the common general knowledge in any jurisdiction as at the priority date of the application.

- 15 **[0003]** Current tobacco products include heated tobacco products to generate aerosols or vapors for consumption. Devices for heating such heated tobacco products include at least one heating part, typically in the form of a heating pin, shaped and dimensioned for insertion into a tobacco unit of the heated tobacco product. The heating pin contacts a surface of the tobacco unit to a suitable temperature to produce tobacco vapors or aerosol for
20 consumption by a user. Tobacco products adapted to be heated by such devices may be referred to as 'not-for-burn' or 'heat-not-burn' products.

- 25 **[0004]** However, current not-for-burn products face different drawbacks. For example, heat may not be evenly distributed within the tobacco unit, leading to increased temperature at certain portions of the tobacco product that can inadvertently cause injury to a consumer.

- [0005]** In addition, there exists a need to improve the tobacco units so as to reduce usage of tobacco materials without noticeable effect on the quality of aerosol produced for the consumer, and/or reduce the overall weight of the

tobacco unit. The need to reduce tobacco usage is also tied to the reduction of tobacco consumption.

5 [0006] Another potential problem faced by existing not-for-burn products or aerosol-generating product is that current not-for-burn products are not well-accommodated for insertion of heating devices. Aerosol generating materials can be displaced when one or more heating portions of a heating device are inserted, compromising the quality of consumption and/or leading to wastage of materials.

10 [0007] The disclosure seeks to mitigate the drawback and/or meet the aforementioned needs at least in part.

SUMMARY

15 [0008] In accordance with an aspect of the disclosure there is a tobacco unit comprising at least one tobacco portion arranged to form a hollow portion, the hollow portion shaped and dimensioned to receive a heating part of a heating device.

[0009] In some embodiments, the tobacco unit further comprises a wrapper to cover at least a surface of the tobacco portion.

20 [0010] In some embodiments, the hollow portion is layered with at least one of the following materials: paper, metallic foil, and combinations of the aforementioned materials.

[0011] In some embodiments, the tobacco portion comprises at least one planar sheet of tobacco.

[0012] In some embodiments, the wrapper is formed from paper.

25 [0013] In some embodiments, the wrapper comprises at least one paper arranged to wrap around the surface of the tobacco portion in a manner such that at least one portion of the paper overlaps another portion of the paper.

[0014] In some embodiments, the at least one paper is arranged in a spiral-like manner around the surface of the tobacco portion.

[0015] In some embodiments, the at least one tobacco portion comprises a plurality of tobacco sheets crimped together.

5 **[0016]** In some embodiments, the heating part of the heating device comprises a pin.

[0017] According to another aspect of the disclosure there is an apparatus for forming a tobacco unit comprising a tobacco sheet dispenser for dispensing at least one tobacco sheet; a hollow former arranged to receive
10 the at least one tobacco sheet to be rolled thereon to form a rolled tobacco sheet having a hollow centre; wherein the hollow centre is shaped and dimensioned to receive a heating part of a heating device; a shape former arranged to receive the rolled tobacco sheet to form a tobacco portion; and a cover dispenser to dispense a cover on the tobacco portion to form the
15 tobacco unit.

[0018] In some embodiments, the apparatus further comprises at least one first cutter arranged upstream the hollow former to cut the at least one tobacco sheet to a desired dimension.

[0019] In some embodiments, the apparatus further comprises a second
20 cutter arranged to cut the tobacco unit to a desired dimension.

[0020] In some embodiments, the apparatus further comprises a roller arranged to receive the cover from the cover dispenser to wrap the cover around a surface of the tobacco portion in a manner such that at least one portion of the cover overlaps another portion of the cover.

25 **[0021]** In some embodiments, the apparatus further comprises a plurality of tobacco sheet dispensers for dispensing a plurality of tobacco sheets, and a crimper arranged to crimp the plurality of tobacco sheets.

[0022] According to another aspect of the disclosure there is a tobacco unit

comprising at least one tobacco portion comprising a plurality of non-planar tobacco strips, the plurality of non-planar tobacco strips arranged such that there comprises a plurality of air pockets within the tobacco portion, wherein the plurality of air pockets are shaped and dimensioned to receive a heating part of a heating device.

[0023] According to another aspect of the disclosure there is an apparatus for forming a tobacco unit comprising a plurality of tobacco sheet dispensers for dispensing a plurality of tobacco sheets; a plurality of rollers for receiving each of the plurality of tobacco sheets to form a plurality of non-planar tobacco strips; a shape former arranged to receive the non-planar tobacco strips and conform the non-planar tobacco strips into a tobacco portion; and a cover dispenser to dispense a cover on the tobacco portion to form the tobacco unit; wherein the tobacco portion comprises a plurality of air pockets.

[0024] Other aspects of the disclosure will be apparent to those of ordinary skill in the art upon review of the following description of specific embodiments of the disclosure in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Various embodiments are described, by way of example only, with reference to the accompanying drawings, in which:

[0026] Fig. 1a and Fig. 1b illustrate a tobacco unit and a method for producing the same according to an embodiment;

[0027] Fig. 2a and Fig. 2b illustrate a tobacco unit and a method for producing the same according to another embodiment;

[0028] Fig. 3a and Fig. 3b illustrate a tobacco unit and a method for producing the same according to another embodiment;

[0029] Fig. 4 illustrates a tobacco unit and according to another embodiment;

[0030] Fig. 5a and Fig. 5b illustrate a tobacco unit and a method for producing the same according to another embodiment; and

[0031] Fig. 6a to Fig. 6d illustrates various embodiments of vapour or aerosol generating units.

5 **[0032]** Other arrangements are possible and it is appreciable that the accompanying drawings are not to be understood as superseding the generality of the preceding description of the disclosure.

DETAILED DESCRIPTION

10 **[0033]** Particular embodiments are described with reference to the accompany drawings. The terminology used herein is for the purpose of describing particular embodiments only and is not intended to limit the scope of the present disclosure. Other definitions for selected terms used herein may be found within the detailed description of the disclosure and apply throughout the description. Additionally, unless defined otherwise, all technical and
15 scientific terms used herein have the same meanings as commonly understood by one ordinary skilled in the art to which the present disclosure belongs. Where possible, the same reference numerals are used throughout the figures for clarity and consistency.

[0034] Throughout the specification, unless the context requires otherwise,
20 the word “comprise” or variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0035] Throughout the specification, unless the context requires otherwise, the word “include” or variations such as “includes” or “including”, will be
25 understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0036] Throughout the specification, unless the context requires otherwise, the word “have” or variations such as “has” or “having”, will be understood to

imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0037] Throughout the specification, unless the context requires otherwise, the term “tobacco” will be understood to include raw or processed materials prepared from a part of the tobacco plant, such as leaves, through the process of drying or curing, and further optional processes of aging, fermenting, flavouring etc., and can include any other materials derived from any forms of tobacco leaves such as ground and reconstituted tobacco material.

[0038] Throughout the specification, unless the context requires otherwise, the term “tobacco unit” will be understood to be a portion of a tobacco product formed substantially from/of tobacco. The tobacco unit may include other non-tobacco based material such as paper, fibers, artificial flavorings and/or aerosol generating materials.

[0039] Throughout the specification, unless the context requires otherwise, the term “tobacco product” will be understood to include a tobacco unit. The tobacco product may include other portions such as one or more filter units, one or more tobacco units, and/or one or more heat dissipation units etc.

[0040] Throughout the specification, unless the context requires otherwise, the term “fiber” will be understood to depict a slender and substantially elongated shape.

[0041] Throughout the specification, unless the context requires otherwise, the term “sheet” will be understood to depict a planar surface with a substantially higher length and/or width compared to thickness.

[0042] Throughout the specification, unless the context requires otherwise the term ‘wrapped’ or ‘unwrapped’ refers to a covering/non-covering of a tobacco unit. The cover may be for purpose of maintaining a structural integrity of the tobacco unit. Any wrapping or cover seeks to provide structural integrity to the tobacco unit.

[0043] Fig. 1a and 1b illustrate an embodiment of a tobacco unit 100 and a method 1000 for producing the same respectively.

[0044] Referring to Fig. 1a, the tobacco unit 100 comprises a hollow portion 102, the hollow portion shaped and dimensioned to receive a heating portion (e.g. in the form of an elongated rod or pin) of a heating device such as an aerosol generating device. The aerosol generating device may include, but is not limited to, a device for heating the tobacco unit 100 to generate aerosol without combusting the tobacco unit 100; a tobacco portion 104 arranged adjacent the hollow portion 102, the tobacco portion 104 surrounds at least part of the hollow portion 102; and an outer cover 106 arranged to at least provide structural integrity to the tobacco unit.

[0045] The hollow portion 102 is shaped and dimensioned for a heating pin of a heating device (not shown) to insert therethrough.

[0046] In some embodiments the hollow portion 102 may be formed when the tobacco portion 104 is rolled on a shape former to form a rod as part of a manufacturing process/step.

[0047] In some embodiments, the hollow portion comprises at least one material that facilitates heat transfer via conduction, convection and/or radiation across a dimension of the tobacco unit 100. The dimension may be the length of the tobacco unit 100. Suitable materials include metallic foils (such as copper, aluminum or silver foils). The at least one material may surround a perimeter, such as a circumference of the hollow portion. The at least one material may be positioned on a hollow former for forming the hollow portion 102 as part of a manufacturing process such that when the tobacco portion 104 is rolled about the hollow former as a centre, the at least one materials forms an inner surface of the tobacco portion 104 such that in use the at least one material can contact a heating part of the heating device. The inner surface may correspond to a perimeter or circumference.

[0048] In some embodiments, the inner surface forming the hollow portion can be coated with one or more layers of cast-leaf tobacco sheets. In some embodiments, the inner surface may be sprayed with tobacco powder.

5 **[0049]** In some embodiments, the at least one material forming the hollow portion 102 includes heat conducting materials such as paper, paper yarn, metallic foil such as aluminum foil, natural fiber, any combinations or derivatives thereof.

10 **[0050]** The hollow portion 102 is arranged or configured such that in use, a surface (comprising the heat conductive material) of the hollow portion 102 is exposed, adjacent to, within proximity of, or in contact with the heating pin.

[0051] The tobacco portion 104 may be formed from at least one planar sheet 108. In some embodiments, the at least one planar sheet 108 may comprise a pre-cut tobacco sheet or pre-dimensioned tobacco sheet 110. In other embodiments, the at least one planar sheet 108 may comprise a full
15 sheet 112 without the need for cutting or dimensioning.

[0052] Referring to Fig. 1b, the apparatus and method 1000 for producing the tobacco unit 100 includes using a manufacturing apparatus. The manufacturing apparatus for forming a tobacco unit comprises a tobacco sheet dispenser for dispensing at least one tobacco sheet; a hollow former
20 arranged to receive the at least one tobacco sheet to be rolled thereon to form a rolled tobacco sheet having a hollow centre; wherein the hollow centre is shaped and dimensioned to receive a heating part of a heating device; a shape former arranged to receive the rolled tobacco sheet to form a tobacco portion; and a cover dispenser to dispense a cover on the tobacco portion to
25 form the tobacco unit.

[0053] The method 1000 comprises the steps of (a.) feeding a tobacco roll into a plurality of cutters to form a plurality of pre-cut tobacco sheets (step s1002); (b.) layering at least one pre-cut tobacco sheet on a hollow core (step s1004); (c.) shaping the resulting layered tobacco unit into tobacco portion

having a hollow portion (step s1006); and (d.) covering the tobacco portion with an outer cover (step s1008).

[0054] Fig. 2a and 2b illustrate another embodiment of a tobacco unit 200 and a method 2000 for producing the same respectively.

5 **[0055]** Referring to Fig. 2a, the tobacco unit 200 comprises a hollow portion 202, the hollow portion 202 shaped and dimensioned to receive a heating pin of a heating device such as a heat-not-burn device; a tobacco portion 204 arranged adjacent the hollow portion 202, the tobacco portion 204 surrounds at least part of the hollow portion 202; and an outer cover 206 arranged to at
10 least provide structural integrity to the tobacco unit.

[0056] The hollow portion 202 is shaped and dimensioned for a heating pin of a heating device (not shown) to insert therethrough.

[0057] The hollow portion 202, tobacco portion 204 may be similar in material(s) and arrangement as the hollow portion 102 and tobacco portion
15 104.

[0058] The outer cover 206 may be suitably formed from paper or any materials capable of holding the tobacco portion 204 and maintaining the structural integrity of the tobacco portion 204. Non-limiting examples of the outer cover 206 include paper or other cellulose-based materials. The outer
20 cover 206 may be similar to the outer cover 106. Alternatively, the outer cover 206 may be arranged in a spiral-like manner around the surface of the tobacco portion 204. Such an arrangement provides overlapping layers on the outer surface of the tobacco unit 200 which can further enhance the structural integrity of the unit 200.

25 **[0059]** Referring to Fig. 2b, the manufacturing apparatus is used to produce the tobacco unit 200 according to the following method steps: (a.) feeding a tobacco roll into a plurality of cutters to form a plurality of pre-cut tobacco sheets (step s2002); (b.) layering a pre-cut tobacco sheet on a hollow core (step s2004); (c.) shaping the resulting layered tobacco unit into an tobacco

portion (step s2006); and (d.) layering the tobacco portion with an outer cover, wherein the step of layering the outer cover on the tobacco portion includes rolling the outer cover around the tobacco portion in a manner such that at least one portion of the cover overlaps another portion of the cover (step
5 s2008).

[0060] In some embodiments, as an alternative or in addition to layering the tobacco portion with an outer cover, another tobacco sheet may be layered on the tobacco portion and rolling the another tobacco sheet around the tobacco portion in a manner such that at least one portion of the another tobacco
10 sheet overlaps another portion of the another tobacco sheet.

[0061] In yet another embodiment, the pre-cut tobacco sheet may be shaped in step s2006 in a manner such that at least one portion of the pre-cut tobacco sheet overlaps another portion of the pre-cut tobacco sheet.

[0062] Fig. 3a and 3b illustrate another embodiment of a tobacco unit 300
15 and a method 3000 for producing the same respectively.

[0063] Referring to Fig. 3a, the tobacco unit 300 comprises a hollow portion 302, the hollow portion 302 shaped and dimensioned to receive a heating pin of a heating device such as a heat-not-burn device; a tobacco portion 304 arranged adjacent the hollow portion 302, the tobacco portion 304 surrounds
20 at least part of the hollow portion 302; and an outer cover 306 arranged to at least provide structural integrity to the tobacco unit.

[0064] The hollow portion 302 is shaped and dimensioned for a heating pin of a heating device (not shown) to insert therethrough.

[0065] The hollow portion 302, outer cover 306 may be similar in material(s)
25 and arrangement as the hollow portion 102 and cover portion 106.

[0066] The tobacco portion 304 is formed from multiple tobacco sheets being combined together via adhesion, crimping, or embossing. It is contemplated that each of the multiple tobacco sheets may be of different

dimensions (e.g. different thickness) in relation to at least one other tobacco sheets. It is contemplated that each of the tobacco sheets may be different in tobacco composition and structure compared to at least one other tobacco sheet.

- 5 **[0067]** The tobacco portion 304 may comprise an opening such that when viewed from an angle, the tobacco portion 304 forms a 'C' or 'U' shape.

[0068] The hollow portion 302 may be formed when the tobacco portion 304 is rolled on a shape former to form a rod as part of a manufacturing process/step.

- 10 **[0069]** Referring to Fig. 3b, the manufacturing apparatus is used to produce the tobacco unit 300 according to the following method steps: (a.) feeding multiple tobacco rolls into a plurality of cutters to form a plurality of pre-cut tobacco sheets (step s3002), each tobacco sheet may be different in dimension and/or composition from at least one other tobacco sheet; (b.)
15 layering the plurality of pre-cut tobacco sheets on a hollow core (step s3004); (c.) combining the plurality of pre-cut tobacco sheets into an tobacco portion via a step of adhesion, crimping or embossing (step s3006); and (d.) layering the tobacco portion with an outer cover.

- [0070]** Fig. 4 illustrates another embodiment of a tobacco unit 400 for
20 producing the same respectively.

- [0071]** Referring to Fig. 4a, the tobacco unit 400 comprises at least one tobacco portion 404 comprising a plurality of tobacco strips 412. The tobacco strips 412 may be formed from cast leaf tobacco sheet. The tobacco sheet can include reconstituted tobacco materials and may also include different
25 varying percentages non-tobacco materials. The tobacco portion 404 may be wrapped with an outer cover 406. The outer cover 406 may be formed from/of cellulose fiber based material such as paper and/or acetate tow, or any natural materials. Such an arrangement of tobacco strips 412 wrapped with acetate tow 406 was found to produce a synergistic effect wherein the

resultant tobacco unit 400 requires less tobacco for generating an acceptable level of quality for consumption. The acetate tow 406 further enhances any filtration effect of any heated tobacco vapor for a user's consumption. As an alternative or in addition to acetate tow, other materials such as natural fiber,
5 and /or carbon based material such as charcoal may be contemplated.

[0072] In some embodiments, the at least one tobacco portion 404 may include a hollow portion 402. The hollow portion 402 may not be a through hollow but is dimensioned so as to receive a portion of a heating device. In use, the heating part (which may be shaped as a pin) may contact a surface
10 of the at least one tobacco portion 404 or may be inserted into part of the tobacco portion 404 such that when heat is applied, the tobacco portion 404 generates a vapour for consumption without combusting.

[0073] In some embodiments, the hollow portion 402 may be layered with a one or more heat transmitting material such that when the heating part or part
15 thereof is inserted into the hollow portion 402, the heating part does not directly contact the at least one tobacco portion 404 but heated is indirectly transmitted from the heating part to the tobacco portion 404 via the layer of heat transmitting material.

[0074] In the various embodiments describing the production or
20 manufacture of a tobacco unit 100, 200, 300, an apparatus 500 for forming a tobacco unit may include the following:

[0075] a tobacco sheet dispenser 502 for dispensing at least one tobacco sheet;

[0076] a hollow former 504 arranged to receive the at least one tobacco
25 sheet to be rolled thereon to form a rolled tobacco sheet having a hollow centre; wherein the hollow centre is shaped and dimensioned to receive a heating part of a heating device; a shape former 506 arranged to receive the rolled tobacco sheet to form a tobacco portion; and a cover dispenser 508 to dispense a cover on the tobacco portion to form the tobacco unit.

[0077] In some embodiments there is at least one first cutter 510 arranged upstream the hollow former to cut the at least one tobacco sheet to a desired dimension.

5 **[0078]** In some embodiments there is a second cutter 512 arranged to cut the tobacco unit 100, 200, 300 to a desired dimension.

[0079] In some embodiments there is a roller 514 arranged to receive the cover from the cover dispenser to wrap the cover around a surface of the tobacco portion in a manner such that at least one portion of the cover overlaps another portion of the cover.

10 **[0080]** In some embodiments where there comprises a plurality of tobacco sheet dispensers for dispensing a plurality of tobacco sheets, there comprises a crimper or embosser 516 arranged crimp/emboss the plurality of tobacco sheets.

15 **[0081]** It is envisaged that the tobacco unit of the present disclosure may include multiple hollow portions shaped in various dimensions, sizes and shapes. Referring to Fig. 5a, various embodiments 900a, 900b, 900c and 900d of a tobacco unit 900 formed from an extrusion method can include a circular hollow (see 900a), a rectangular hollow (see 900b), four hollow portions defined by a T-shaped tobacco centre and a perimeter of the tobacco unit (see 900c), and nine-hollow portions defined by criss-cross tobacco portions and the perimeter of the tobacco unit (see 900d). The tobacco units 900a to 900d may be formed from a cool extrusion method.

20 **[0082]** To be suitable for extrusion, the tobacco unit 900 may preferably have enough moisture/liquid to produce a slurry to be fed into an extruder. To produce a slurry in a form suitable for extrusion, tobacco in powdered form and other ingredient(s) including powdered flavourings, powdered heat conductive materials (e.g. metallic power or strips), and/or powdered binding agents such as Carboxymethyl cellulose (CMC), cellulose gum, or cellulose fiber may be mixed with an aqueous solution comprising water as the main constituent. The

resultant tobacco unit 900 may comprise water content in a range of 3% to 50%. In some embodiments, the tobacco units 900a to 900d may be covered with any one of the outer covers 106, 206 and 306. In some embodiments, the tobacco units 900a to 900d may not require any outer cover, provided the binding agent in combination of water content is sufficient to maintain a structural integrity of the tobacco unit 900.

[0083] In some embodiments, oil may be added to the slurry as another binding agent.

[0084] Referring to Fig. 5b, a system or apparatus 5000 for producing tobacco products may be used to produce the tobacco units 900a to 900d. The system comprises a mixer 5020 for forming the slurry, an extruder 5040 for forming any one of the tobacco units 900a to 900d, and a dryer 5060 for drying the formed tobacco unit 900a to 900d to having a moisture level of at least 5% achieved with a heat drying method, a freeze drying method, or one or more combinations of the aforementioned drying methods. In some embodiments, multiple dryers 5060 may be used alternating with different permutations of heat and freeze drying mechanisms/methods. If desired, the dried tobacco units 900a to 900d can be sized to desired dimensions. This may be achieved via a cutter 5080.

[0085] The extruder 5040 may be an extrusion machine operating at a temperature of less than 300 degrees Celsius.

[0086] The various described embodiments of the tobacco units 100, 200, 300, 400, 900 may form part of a tobacco product (not shown). The tobacco product may include other elements such as one or more filter units and one or more heat dissipation units. The filter unit(s) may be in a segmented form and include filter elements such as mono filter acetate segments or hollow filter non-wrap acetate segments.

[0087] In some embodiments, the tobacco product may be dimensioned via cutting into a plurality of segments. In one example, the tobacco product may

be in the form of a rod and cut into two to twenty parts.

[0088] It is contemplated that the tobacco portion 104, 304, 404 may be replaced by non-tobacco portions to form other consumable units that may produce vapor or aerosol when used with a heating device.

5 **[0089]** Fig. 6a to Fig. 6d illustrates various embodiments of a consumable unit in the form of an aerosol-generating unit 600. Each consumable unit 600 may comprise a first portion 604. The first portion 604 may comprise tobacco or may not comprise tobacco. The first portion 604 may be formed from non-tobacco base materials including fibers, and/or and may be coated,
10 embedded or mixed with aerosol generating substrate or substance 606. The first portion 604 may be formed from an aerosol generating substance or substrate 606 in itself, and the first portion 604 can become another type or source of aerosol generating substance.

[0090] The aerosol generating substance 606 may be in the form of
15 powder, liquid, particulates, sheet etc. In the embodiments as shown in Fig. 6a to Fig. 6d, the aerosol generating substance 606 may include natural and/or an artificial flavouring such as mint, cinnamon, menthol, licorice, chocolate in various concentrations and proportions so as to produce the desired flavour or aerosol when used.

20 **[0091]** In some embodiments, the non-tobacco first portions 604 may be sprayed or coated with aerosol generating substance 606 in the form of liquid nicotine or nicotine in other form. The liquid nicotine may be extracted from tobacco or may be artificially manufactured.

[0092] It is contemplated that when the aerosol-generating substance 606
25 is heated to a predetermined temperature that is below (or well below) the combustion temperature of the respective tobacco or non-tobacco first portions 604, the aerosol-generated substance 606 produces vapour for consumption by a user.

[0093] Fig. 6a illustrates the first portion 604 in the form of a hollow rod-

shaped segment having the aerosol generating substance 606 coated in an inner surface of the hollow rod. Preferably, the hollow rod-shaped segment in Fig. 6a is a non-tobacco segment having paper and/or natural fibers as base material. The aerosol generating substance 606 coated in the inner surface
5 can be a tobacco sheet, such as a CLT sheet with or without added flavourings, nicotine.

[0094] Fig. 6b(i) illustrates a first portion in the form of a hollow rod-shaped segment 604 having the aerosol generating substance 606 dispersed throughout the same. Preferably, the hollow rod-shaped segment in Fig. 6a is
10 a non-tobacco segment having paper and/or natural fibers as base material. The dispersion may be homogenously achieved via spraying, coating, embossing and/or other manufacturing methods before or after the rod-shaped segment 604 is formed into shape. Tobacco powder may form at least part of the aerosol generating substance 606.

[0095] Fig. 6b(ii) illustrates a first portion in the form of a non-hollow rod-shaped segment 604 having the aerosol generating substance 606 dispersed throughout the same. The dispersion may be homogenously achieved via spraying and/or coating. The aerosol generating substrate 606 may be pre-mixed with the first portion 604 before being formed into shape.

[0096] Fig. 6b(iii) and Fig. 6b(iv) illustrate the aerosol generating substance 606 embedded in the first portion 604 before it is formed into the rod-shaped segment of 6b(i) or 6b(ii). The first portion 604 in its pre-formed shape may be a rectangle or oval.

[0097] Fig. 6c(i) illustrates the first portion 604 in the form of a hollow rod-shaped segment having the aerosol generating substance 606 coated on an
25 outer surface of the hollow rod-shaped segment. Preferably, the hollow rod-shaped segment in Fig. 6c(i) is a non-tobacco segment having paper and/or natural fibers as base material. The aerosol generating substance 606 coated in the outer surface can be a tobacco paper, or a paper coated with nicotine.

[0098] Fig. 6c(ii) illustrates the first portion 604 having different possible hollow-shapes. The shapes may include circle, rectangle, triangle, cross. Multiple hollow portions may be formed in the first portion 604.

5 **[0099]** Fig. 6c(iii) illustrates the first portion 604 having its surface coated with the aerosol generating substance 606. The aerosol generating substance 606 may be coated on the surface of the first portion 604 in a grid-like configuration. Other criss-cross configuration of coating the surface of the first portion 604 is contemplated.

10 **[00100]** Fig. 6d illustrates the first portion 604 in the form of a non-hollow rod-shaped segment having the aerosol generating substance 606 coated on an outer surface of the hollow rod-shaped segment.

15 **[00101]** It is contemplated that the aerosol generating substrate 606 of the embodiments of Fig. 6a to Fig. 6d may be combined to form further embodiments. For example, the inner surface and outer surface of the first portion 604 in the form of a non-hollow rod-shaped segment may be coated with the aerosol generating substrate 606.

20 **[00102]** In some embodiments, the aerosol-generating substance 606 may also include Propylene Glycol (PG), Vegetable Glycerin (VG). The aerosol-generating substance may also include nicotine, water, artificial or natural flavourings in various proportions.

[00103] In some embodiments, the first portion 604 may include at least one of the following: cloves, kemenyan incense, natural resin, flowers, herbs, tea, and fruits.

25 **[00104]** In some embodiments, one or more filter portions (not shown) may be arranged adjacent or adjoining the first portion 604. The filter portion is positioned such that in use, the filter portion is between the point of consumption (e.g. a person's mouth) and the first portion 604.

[00105] In some embodiments, the filter portion may include an elongate

filter body having a recess formed on a surface of the elongate filter body, the recess shaped and dimensioned to accommodate a protruding portion of a heating element, such that when the heating element is inserted through the first portion, at least one gap is formed between the protruding portion of the
5 heating element and the filter body.

[00106] It is contemplated that one or more first portions 604 and one or more filter portions may be arranged in various combinations to produce additional embodiments.

[00107] It is contemplated that the aerosol-generating substance 606 in
10 the various embodiments shown in Fig. 6a to 6d may be combined to form further embodiments.

[00108] In general, the embodiments of Figs. 6a to 6d are suited for use with a heating device to produce aerosol or vapour for consumption. Where the first portion 604 comprises non-tobacco materials, the overall tobacco
15 content of the final product is reduced while providing a similar consumption pleasure to a user via the aerosol generating substance 606, minimizing the harmful effects associated with tobacco.

[00109] The embodiments as described may form part of a kit comprising a consumable unit or aerosol-generating unit, one or more filter
20 portions, and/or one or more aerosol generating devices. In some embodiments, the one or more filter portions may be incorporated with the one or more aerosol generating devices. The one or more aerosol generating devices may be electrically powered and may comprise one or more heatable portions for contact with the consumable unit. The one or more heatable
25 portions may be in the form of a rod-like heating pin or in the form of one or more heating plates.

[00110] It should be appreciated by the person skilled in the art that variations and combinations of features described above, not being alternatives or substitutes, may be combined to form yet further embodiments

falling within the intended scope of the invention. As examples:

- The tobacco portion 304 may be combined with the cover portion 206 to form another embodiment;
- 5 • The tobacco portion 104, 304, 404 may be combined with the cover portion 206 to form another embodiment.
- A tobacco sheet forming part of the tobacco portion 204 may be used as the cover 206, where the tobacco sheet is rolled around the tobacco portion 204 in a manner such that at least one portion of the tobacco sheet overlaps another portion of the tobacco sheet.
- 10 • The tobacco material illustrated in the embodiment of Fig. 4 may include cast leaf tobacco and be incorporated into the tobacco portions of other embodiments.
- The hollow portions 102, 202, 302, 402 may have a diameter that range from 3mm to 6mm.
- 15 • In the various embodiments, it is contemplated that the tobacco portion comprises at least one planar sheet of tobacco or a plurality of sheets comprising at least one of the following: tobacco, natural fiber, carbon based compound (for example charcoal), glycerol, propylene glycol, natural or artificial flavoring, binding agent (for example gum and/or
- 20 Carboxymethyl cellulose, commonly referred to as CMC).
- Although the disclosure has been described in the context of tobacco units, it is appreciable that a hollow portion may be formed on other aerosol generating units, such as flavored consumables units. The hollow portion may be shaped and dimensioned to receive a heating
- 25 part of an aerosol generating device (e.g. a heating device).

CLAIMS

1. A tobacco unit comprising
at least one tobacco portion arranged to or moulded to form a hollow
5 portion, the hollow portion shaped and dimensioned to receive a heating part
of a heating device, wherein the tobacco portion comprises at least 5%
tobacco.
2. The tobacco unit of claim 1, further comprises a wrapper to cover at least a
10 surface of the tobacco portion.
3. The tobacco unit of claim 1 or 2, wherein the hollow portion is layered with
at least one of the following materials: paper, metallic foil, and combinations of
the aforementioned materials.
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4. The tobacco unit of any one of claims 1 to 3, wherein the tobacco portion
comprises at least one planar sheet of tobacco or a plurality of sheets
comprising at least one of the following: tobacco, natural fiber, carbon based
compound, glycerol, propylene glycol, natural or artificial flavoring, binding
20 agent.
5. The tobacco unit of any one of claims 2 to 4, wherein the wrapper is formed
from paper or acetate tow or natural fiber or any combination of the
aforementioned.
25
6. The tobacco unit of claim 1, wherein the at least one tobacco portion is
formed in a manner such that at least one tobacco portion overlaps another
portion of the tobacco portion.
- 30 7. The tobacco unit of claim 6, wherein the at least one tobacco portion is
overlapped in a spiral-like manner around the surface of the hollow.

8. The tobacco unit of claim 1, wherein the at least one tobacco portion comprises a plurality of tobacco sheets crimped together.

5 9. The tobacco unit of claim 1, wherein the at least one tobacco portion comprises a plurality of cast-leaf tobacco (CLT) sheets.

10. The tobacco unit of any one of the preceding claims, wherein the heating part of the heating device comprises a pin.

10 11. An apparatus for forming a tobacco unit comprising
a tobacco sheet dispenser for dispensing at least one tobacco sheet;
a hollow former arranged to receive the at least one tobacco sheet to
be rolled thereon to form a rolled tobacco sheet having a hollow centre;
wherein the hollow centre is shaped and dimensioned to receive a heating
15 part of a heating device;
a shape former arranged to receive the rolled tobacco sheet to form a
tobacco portion; and
a cover dispenser to dispense a cover on the tobacco portion to form
the tobacco unit.

20 12. The apparatus of claim 11, further comprises at least one first cutter
arranged upstream the hollow former to cut the at least one tobacco sheet to
a desired dimension.

25 13. The apparatus of claim 11 or 12, further comprises a second cutter
arranged to cut the tobacco unit to a desired dimension.

14. The apparatus of any one of claims 11 to 13, further comprises a roller
arranged to receive the cover from the cover dispenser to wrap the cover
30 around a surface of the tobacco portion in a manner such that at least one
portion of the cover overlaps another portion of the cover.

15. The apparatus of any one of claims 11 to 14, further comprises a plurality of tobacco sheet dispensers for dispensing a plurality of tobacco sheets, and a crimper arranged to crimp the plurality of tobacco sheets.

5 16. An apparatus for forming a tobacco unit comprising
a plurality of tobacco sheet dispensers for dispensing a plurality of tobacco sheets;

a plurality of rollers for receiving each of the plurality of tobacco sheets to form a plurality of non-planar tobacco strips;

10 a shape former arranged to receive the non-planar tobacco strips and conform the non-planar tobacco strips into a tobacco portion; and

a cover dispenser to dispense a cover on the tobacco portion to form the tobacco unit;

wherein the tobacco portion comprises a plurality of air pockets.

15

17. A tobacco unit comprising

at least one tobacco portion comprising a plurality of planar or non-planar tobacco strips, the plurality of planar or non-planar tobacco strips comprises at least one of: tobacco sheets, natural fiber, carbon based compound, glycerol, propylene glycol, natural or artificial flavorings, and/or
20 binding agent; wherein the tobacco portion is wrapped by at least one layer of acetate tow, and/or natural fiber, and /or charcoal, and wherein the tobacco unit has a diameter having a range from 5 millimetres (mm) to 20 millimetres.

25 18. A tobacco unit comprising at least one tobacco portion arranged to form a hollow portion, the hollow portion shaped and dimensioned to receive a heating part of a heating device, wherein the at least one tobacco portion comprises a tobacco content of having a range of 5% to 95%, and wherein the hollow portion has a diameter of 0.1mm and above.

30

19. An apparatus for manufacturing a tobacco unit comprising

a mixer configured to mix powered tobacco with at least one of a powdered binding agent, a powdered flavouring, a powdered heat conductive material, and water to form a slurry;

an extrusion device to receive the slurry to form an intermediate tobacco product;

a dryer to dry to intermediate tobacco product to form the tobacco unit.

20. A tobacco product comprising the tobacco unit of any one of claims 1 to 10, claim 17 or 18, wherein the tobacco product includes at least one of a mono filter acetate, a hollow filter non-wrap acetate, and wherein the tobacco unit is formed from extrusion and/or comprises a reconstituted tobacco portion.

21. The tobacco product according to claim 20, wherein the tobacco product is cut into a number from two to more than 2 pieces, and preferably up to 20 pieces.

22. A consumable unit comprising a first portion having a base material formed from a non-tobacco substance;

an aerosol-generating substrate comprising at least one of the following: tobacco powder, cast leaf tobacco compound, nicotine, and flavouring;

wherein the first portion is configured to be heated by an aerosol-generating device in such a manner that the first portion is not combusted, and the aerosol-generated substrate produces a vapour for consumption when heated.

23. The consumable unit according to claim 22, wherein the aerosol-generating substrate comprises at least one of Propylene Glycol (PG) and Vegetable Glycerin (VG).

24. The consumable unit according to claim 22 or 23, wherein the base material comprises paper or cellulose fiber, and the aerosol-generating substrate comprises nicotine.

25. The consumable unit according to any one of claims 22 to 24,
5 further comprises at least one filter portion arranged to adjoin the first portion, in a manner such that in use, the filter portion is between the point of consumption and the first portion.

26. The consumable unit according to claim 25, wherein the filter
10 portion comprises an elongate filter body having a recess formed on a surface of the elongate filter body, the recess shaped and dimensioned to accommodate a protruding portion of a heating element, wherein when the heating element is inserted through the first portion, at least one gap is formed between the protruding portion of the heating element and the filter body.

15 27. The consumable unit according to claim 26, wherein the first portion may be shaped and dimensioned to include a hollow portion, the hollow portion adapted shaped and dimensioned to accommodate the protruding portion of the heating element, wherein when the heating element is inserted through the first portion, at least one gap is formed between the protruding
20 portion of the heating element and the first portion.

28. A kit comprising
a consumable unit according to any one of claims 22 to 28;
an aerosol-generating device configured to receive the consumable
25 unit; and
at least one filter unit.