

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 February 2008 (07.02.2008)

PCT

(10) International Publication Number
WO 2008/016520 A2

(51) International Patent Classification:
A24B 13/00 (2006.01) A24F 23/00 (2006.01)

(21) International Application Number:
PCT/US2007/016658

(22) International Filing Date: 24 July 2007 (24.07.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/461,628 1 August 2006 (01.08.2006) US
11/461,633 1 August 2006 (01.08.2006) US

(71) Applicant (for all designated States except US): **R.J. REYNOLDS TOBACCO COMPANY** [US/US]; 401 North Main Street, Winston-salem, North Carolina 27101-3804 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROBINSON, John, Howard** [US/US]; 604 Antler Court, Kernersville, North Carolina 27284 (US). **PALMER, Laya, Katina** [US/US]; 2845 Atwood Road, Winston Salem, North Carolina 27103 (US). **PATEL, Pankaj** [US/US]; 3761 Squirewood Drive, Clemmons, North Carolina 27012 (US). **MUA, John-Paul** [US/US]; 152 Redmeadow Drive, Advance, North Carolina 27006 (US). **MONSALUD, Luis, Rosete, Jr.** [PH/US]; 1555 Barry Oak Court, Kernersville, North Carolina 27284 (US).

(74) Agents: **SHERMAN, Charles, I.** et al.; Middleton Reutlinger, 2500 Brown & Williamson Tower, Louisville, Kentucky 40202 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

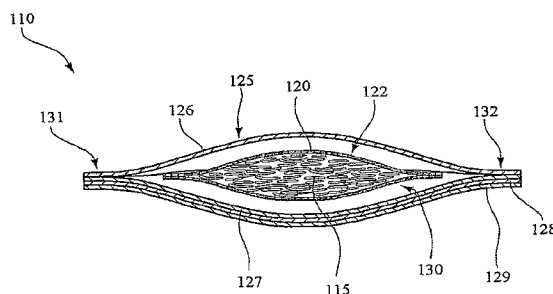
Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- without international search report and to be republished upon receipt of that report

(54) Title: SMOKELESS TOBACCO



(57) Abstract: A smokeless tobacco formulation includes particles or pieces of tobacco, and may include other ingredients, such as salts, sweeteners, binders, colorants, pH adjusters, fillers, flavoring agents, disintegration aids, antioxidants, humectants, and preservatives. Certain smokeless tobacco products have the form of tobacco compositions or formulations that result from casting or otherwise forming a slurry incorporating tobacco material and other components as a film or sheet, and some products have the form of tobacco compositions or formulations that result from pressing, extruding or otherwise forming a mixture incorporating tobacco material and other components into a desired shape. The foregoing tobacco products, as well as snus-type products, can be packaged under conditions of controlled atmosphere. Smokeless tobacco products can be sealed in outer packaging materials that are virtually impervious to oxygen and/or moisture, and those packaging materials can be vacuum sealed or sealed such that the atmosphere therewithin is essentially inert.

SMOKELESS TOBACCO

By

John Howard Robinson, a U.S. citizen, residing at 604 Antler Court, Kernersville, North Carolina 27284;

Laya Katina Palmer, a U.S. citizen, residing at 2845 Atwood Road, Winston Salem, North Carolina 27103;

Pankaj Patel, a U.S. citizen, residing at 3761 Squirewood Drive, Clemmons, North Carolina 27012.

John-Paul Mua, a U.S. citizen, residing at 152 Redmeadow Drive, Advance, North Carolina 27006; and,

Luis Rosete Monsalud, Jr., a Philippines citizen, residing at 1555 Barry Oak Court, Kernersville, North Carolina 27284.

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] This international patent application claims Paris Convention priority to and benefit from, currently pending, U.S. Patent Application Serial Number 11/461,628, filed on August 1, 2006. This international patent application claims Paris Convention priority to and benefit from, currently pending, U.S. Patent Application Serial Number 11/461,633, filed on August 1, 2006.

FIELD OF THE INVENTION

[0001] The present invention relates to tobacco, and in particular, to tobacco formulations suitable for use in a smokeless manner, and to the handling and use of tobacco that is in a smokeless form.

BACKGROUND OF THE INVENTION

[0002] Cigarettes, cigars, little cigars and pipes are popular smoking articles that employ tobacco in various forms. Smoking articles are tobacco products that are used by heating or burning tobacco, and aerosol (e.g., smoke) is inhaled by the smoker. Representative manners or methods that have been proposed for the packaging of tobacco

products, including cigarettes and cigars, are set forth in U.S. Pat. Nos. Des 368,221 to Montague; 1,886,115 to Muller; 3,371,775 to Butler; 3,967,730 to Driscoll et al.; 4,852,734 to Allen et al.; 5,139,140 to Burrows et al.; 5,333,729 to Wolfe; 5,542,529 to Hein, III et al.; 5,938,018 to Keaveney et al. and 7,014,039 to Henson et al.; each of which is incorporated herein by reference.

[0003] Tobacco also may be enjoyed in a so-called “smokeless” form. Particularly popular smokeless tobacco products are employed by inserting some form of processed tobacco or tobacco-containing formulation into the mouth of the user.

[0004] Various types of smokeless tobacco products are set forth in U.S. Pat. Nos. 1,376,586 to Schwartz; 4,513,756 to Pittman et al.; 4,528,993 to Sensabaugh, Jr. et al.; 4,624,269 to Story et al.; 4,987,907 to Townsend; 5,092,352 to Sprinkle, III et al.; 5,387,416 to White et al.; and Des. 335,934 to Howard; U.S. Pat. App. Pub. No. 2005/0244521 to Strickland et al. and 2006/0162732 to Winn et al.; PCT Application Pub. No. WO 04/095959 to Arnarp et al.; PCT Application Pub. No. WO 05/063060 to Atchley et al.; PCT Application Pub. No. WO 05/004480 to Engstrom; and PCT Application Pub. No. WO 05/041699 to Quinter et al.; each of which is incorporated herein by reference. One type of smokeless tobacco product is referred to as “snuff.” Snuff typically is formulated in “moist” or “dry” forms. Representative types of snuff products, commonly referred to as “snus,” are manufactured in Europe, particularly in Sweden, by or through companies such as Swedish Match AB, Fiedler & Lundgren AB, Gustavus AB, Skandinavisk Tobakskompagni A/S and Rocker Production AB. Snus products available in the U.S.A. are marketed under the tradenames Camel Snus Frost, Camel Snus Original and Camel Snus Spice by R. J. Reynolds Tobacco Company. Representative smokeless tobacco products also are marketed under the tradenames Oliver Twist by House of Oliver Twist A/S; Copenhagen, Skoal, SkoalDry, Rooster, Red Seal, Husky, and Revel by U.S. Smokeless Tobacco Co.; “taboka” by Philip Morris USA; and Levi Garrett, Peachy, Taylor’s Pride, Kodiak, Hawken Wintergreen, Grizzly, Dental, Kentucky King, and Mammoth Cave by Conwood Sales Co., L.P.

[0005] Exemplary manners for providing various types of tobacco products for distribution to consumers have been proposed in U.S. Pat. No. 3,696,917 to Levi; PCT WO 2004/095959 to Arnarp et al. and PCT WO 2005/016036 to Bjorkholm; each of

which is incorporated herein by reference. Equipment for packaging tobacco has been commercially available, and representative equipment has been available as FPP 210 Pouch Packer from Schur Flexible Benelux.

[0006] Smokeless tobacco products are packaged for distribution, sale and use in a variety of ways. Chewing tobacco has been packaged in pouches, foil bags and metal containers. Snus types of products have been packaged in tins, "pucks" or "pots" that are manufactured from metal or plastic. In certain circumstances, smokeless tobacco products are refrigerated prior to sale, typically for the purpose of prolonging the freshness and moisture content thereof. For example, smokeless tobacco products, particularly moist tobacco products, can be refrigerated in order to avoid or retard absorption of contaminants that provide an undesirable flavor or odor to the product, avoid or retard the development discoloration or staining of the product, and to avoid or retard the activity of biologically active microorganisms. For example, smokeless tobacco products, and typically moist snuff types of products, can be refrigerated to retard the effects of enzymatic and other biological activities, pH changes, oxidation, and other effects that have a tendency to shorten product shelf-life or stability.

[0007] It would be desirable to provide efficient and effective forms of packaging for a smokeless tobacco composition or formulation. It also would be desirable to provide smokeless tobacco compositions or formulations, and in particular, processed smokeless tobacco compositions and formulations.

SUMMARY OF THE INVENTION

[0008] The present invention relates to a smokeless tobacco product. The product includes a smokeless tobacco composition or formulation. For example, the smokeless tobacco formulation includes particles or pieces of tobacco, and may include other ingredients, such as salts, sweeteners, binders, colorants, pH adjusters, fillers, flavoring agents, disintegration aids, antioxidants, humectants, and preservatives. The moisture content of the particles of the tobacco may vary. Certain smokeless tobacco products have the form of tobacco compositions or formulations that result from casting or otherwise forming a slurry incorporating tobacco material and other components as a film or sheet. Certain smokeless tobacco products have the form of tobacco compositions or

formulations that result from pressing, extruding or otherwise forming a mixture incorporating tobacco material and other components into a desired shape.

[0009] The tobacco formulation can be contained within a container, such as a pouch or bag, such as is the type commonly used for the manufacture of snus types of products (e.g., a sealed, moisture permeable pouch that is sometimes referred to as a “portion”). A representative moisture permeable pouch can be composed of a “fleece” type of material. The tobacco formulation is in turn contained within a package. The package is sealed tightly, and is composed of a suitable material, such that the atmospheric conditions within that sealed package are modified and/or controlled; that is, the sealed package can provide a good barrier that inhibits the passage of compositions such as moisture and oxygen therethrough; in addition, the atmosphere within the sealed package can be further modified by introducing a selected gaseous species (e.g., nitrogen, argon, or a mixture thereof) into the package prior to sealing or by drawing a vacuum therein (vacuum sealing). As such, the atmospheric conditions to which the tobacco composition is exposed are controlled during conditions of preparation, packing, storage and handling.

[00010] In one aspect, an individual portion of smokeless tobacco (e.g., one snus fleece bag containing a smokeless tobacco formulation) can be wrapped in a package. The atmosphere within each package is modified or controlled in a manner characteristic of the present invention. Several snus fleece bags so packaged then can be contained within the product container, such as a metal or plastic tin.

[00011] In one aspect, several individual portions of smokeless tobacco can be wrapped together within one package. The atmosphere within that package is modified or controlled in a manner characteristic of the present invention. That package, or a combination of several of such packages, then can be contained within the product container, such as a metal or plastic tin.

[00012] In one aspect, smokeless tobacco product (e.g., several individual portions of smokeless tobacco) can be contained within a sealed container, such as a metal or plastic tin. That container then can be wrapped within a package, such that the atmosphere within that package and the sealed container is modified or controlled in a manner characteristic of the present invention.

[00013] In one aspect, smokeless tobacco product (e.g., several individual portions of smokeless tobacco) can be contained within a sealed container, such as a metal or plastic tin, and the atmosphere within that sealed container is modified or controlled in a manner characteristic of the present invention.

[00014] In one aspect, at least one individual portion of smokeless tobacco can be wrapped in a package. The atmosphere within each package is modified or controlled in a manner characteristic of the present invention. That package or several of those packages then can be contained within the product container, such as a metal or plastic tin. The atmosphere within that sealed metal or plastic container is modified or controlled in a manner characteristic of the present invention. Alternatively, that container then can be wrapped within an outer package, such that the atmosphere within that package and the sealed container is modified or controlled in a manner characteristic of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[00015] In order to provide an understanding of embodiments of the invention, reference is made to the appended drawings, in which reference numerals refer to components of described exemplary embodiments of the invention. The drawings are exemplary only, and should not be construed as limiting the invention.

[00016] FIG. 1 is an enlarged cross-sectional view of a tobacco product in the form of a snus type of product individually wrapped in an outer package.

[00017] FIG. 2 is a cross-sectional view of a tobacco product in the form of a snus type of product, wherein several snus-type products are wrapped in an outer package and that outer package is contained within a generally cylindrical plastic or metal tin.

[00018] FIG. 3 is a cross-sectional view of a tobacco product in the form of a snus type of product, wherein several snus-type products are contained within a generally cylindrical plastic or metal tin, and that tin is wrapped in an outer package.

[00019] FIG. 4 is a cross-sectional view of a tobacco product in the form of a snus type of product, wherein several snus-type products are contained within a generally cylindrical plastic or metal tin possessing a controlled atmosphere.

[00020] FIG. 5 is cross-sectional view of a tobacco product in the form of a snus type of product, wherein each of several snus-type products are individually wrapped in an outer package, and are in turn contained within a generally cylindrical plastic or metal tin possessing a controlled atmosphere.

[00021] FIG. 6 is a perspective view (partially cut away) of a plurality of individually packaged snus types of products, each individual package being connected to another, and an outer container for containing and dispensing those products.

[00022] FIG. 7 is an enlarged cross-sectional view of a tobacco product in the form of a snus type of product individually wrapped in an outer package.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[00023] Referring to FIG. 1, there is shown a first embodiment of a representative type of smokeless tobacco product 110. The tobacco product 110 includes a tobacco composition 115 contained in a sealed, moisture permeable pouch 120, thereby providing a tobacco portion 122. A representative moisture permeable pouch can be composed of a fleece type of material that is sealed shut in order to effectively retain the tobacco composition within the pouch during normal conditions of handling. The tobacco product 110 possesses a sealed outer package 125 that surrounds and contains the tobacco portion 122 as a type of tightly sealed pouch. The representative outer package 125 possesses an upper surface 126 and a lower surface 127; and the two faces 128, 129 of a "fin seal" are shown lying essentially parallel to the lower surface of outer package 125. The outer package 125 is tightly sealed, and is selected from an appropriate material, such that the atmosphere 130 within that outer package can be controlled. In addition, the atmosphere 130 within the package can be controlled such that the atmosphere is composed most predominantly of high purity nitrogen gas, or other suitable gaseous species. If desired, the embodiment can be altered in order that the outer package contains a plurality (e.g., 2, 3 or 4) of individual tobacco portions. Each of the two ends 131, 132 of the outer package is tightly sealed (e.g., heat sealed), and if desired, those ends can have a serrated appearance, or cut to have the desired visual effect. Preferably, the length of the inner region of the outer package 125 is at least about 10 percent greater than the overall length of the tobacco portion 122, the width of the inner region of the

outer package 125 is at least about 10 percent greater than the overall width of the tobacco portion 122, and the height of the inner region of the outer package 125 is somewhat greater than the overall height of the tobacco portion 122. For an exemplary embodiment, a snus-type of product has a maximum length of about 20 mm to about 30 mm, a width of about 10 mm to about 15 mm, and a height of about 5 mm to about 8 mm; thus the outer package 125 would have an overall length of at least about 30 mm, a width of at least about 30 mm, and a height of at least about 5 mm to about 8 mm; wherein the two end seals 131, 132 of the outer package 125 each extend about 5 mm along the width of the outer package 125, and the “fin seal” has a width of about 10 mm. In use, the outer package 125 is opened by the consumer, the tobacco portion 122 is removed from the outer package, and the tobacco portion is enjoyed by the consumer.

[00024] Referring to FIG. 2, there is shown a second embodiment of a representative smokeless tobacco product 110. The tobacco product 110 includes several tobacco compositions 115, 140, 141 each contained in a respective sealed, moisture permeable pouch 120, 145, 146. The tobacco product 110 possesses a sealed outer package 155 that surrounds and contains all of those individual tobacco portions 125, 157, 158. The number of tobacco portions within the outer package can vary, and can be a number such as 10, 12, 15, 20, 25 or 30. The outer package 155 is tightly sealed, and for the representative embodiment shown, the outer package 155 possesses a three-sided type of packaging configuration (i.e., the packaging material used to manufacture the outer package is sealed on three sides). The outer package 155 is selected from an appropriate material, such that the atmosphere 160 within that outer package can be controlled. For example, the atmosphere 160 within the package can be controlled such that the atmosphere is composed of high purity nitrogen gas, or other suitable gaseous species. The outer package 155 is contained within a hard container 165, such as a plastic or metal tin having a lower portion 168 and a corresponding or coordinating upper portion 170. A representative hard container 165 is the short, rounded edge, generally cylindrical container traditionally used for the marketing of snus types of products. See, for example, the types of representative snuff-box types of designs set forth in PCT WO 2005/016036 to Bjorkholm. Other types of containers that can be suitably modified are plastic or metal type containers set forth in US Pat. No. 7,014,039 to Henson et al. See,

also, the types of hard containers used for the commercial distribution of Camel Snus by R. J. Reynolds Tobacco Company; Revel Mint Tobacco Packs type of smokeless tobacco product by U.S. Smokeless Tobacco Corporation; SkoalDry by U.S. Smokeless Tobacco Co. and “taboka” by Philip Morris USA. If desired, the type of container used for the “taboka” product can be adapted to possess a slidable lid (e.g., one that slides generally parallel to the longitudinal axis of the container) in order that the container can be opened and closed. If desired, the container can have an accordion or bellows type of design, such that the container can be extended open for filling with smokeless tobacco product during production, and then contracted after filling of the container is complete. If desired, containers can be equipped with suitable seals or grommets, in order that when an opened container is re-shut, a good seal is provided.

[00025] In use, the hard container is opened, the outer package is opened, a tobacco portion is removed therefrom, and the tobacco portion is enjoyed by the consumer. The hard container can be manually resealed, and additional tobacco portions can be removed from that container by the consumer as desired.

[00026] Referring to FIG. 3, there is shown a third embodiment of a representative smokeless tobacco product 110. The tobacco product 110 includes several tobacco compositions 115, 140, 141 each contained in a respective sealed, moisture permeable pouch 120, 145, 146. Those individual pouch sealed tobacco portions 156, 157, 158 are themselves contained within a hard container 165, such as a plastic or metal tin having a lower portion 168 and a corresponding or coordinating upper portion 170. The number of tobacco portions within the hard container can vary, and can be a number such as 10, 12, 15, 20, 25 or 30. A representative hard container 165 is the short, rounded edge, generally cylindrical container traditionally used for the marketing of snus types of products. The hard container 165 is in turn packaged within a sealed outer package 180. The representative outer package 180 shown as a representative embodiment has a “lap seal” type of sealing mechanism, and as such, possesses an upper surface 182, a lower surface 183, and an overlap seal 184 located on the bottom face of the outer package. The outer package 180 is tightly sealed at each end 185, 186, and is constructed from an appropriate material, such that the atmosphere 160 within that outer package, and within the hard container 165, is controlled. For example, the atmosphere 160 within the

package can be controlled such that the atmosphere is composed of high purity nitrogen gas, or other suitable gaseous species. In use, the outer package 180 is opened, the hard container 165 is opened, and individual tobacco portions are removed as desired from the hard container.

[00027] Referring to FIG. 4, there is shown a fourth embodiment of a representative smokeless tobacco product 110. The tobacco product 110 includes several tobacco compositions 115, 140, 141 each contained in a sealed, moisture permeable pouch 120, 145, 146, respectively. Those individual tobacco portions 156, 157, 158 are contained within a hard container 165, such as a plastic or metal tin having a lower portion 170 and a corresponding or coordinating upper portion 168. A representative hard container 165 is the short, rounded edge, generally cylindrical container traditionally used for the marketing of snus types of products. The hard container 165 is in turn tightly sealed, and can possess an optional ring or band of a sealing material 195 that circumscribes the hard container in the area of the seal between lower and upper portions 168, 170. As such, conditions are provided so that the atmosphere 160 within the hard container 165, can be controlled (e.g., the atmosphere may be composed of high purity nitrogen gas, or other suitable gaseous species). In use, the ring or band of sealing material 195 is broken, the hard container is opened, and individual tobacco portions are removed as desired from the hard container.

[00028] Referring to FIG. 5, there is shown a fifth embodiment of a representative smokeless tobacco product 110. The tobacco product 110 includes several tobacco compositions 115, 140, 141 each contained in a sealed, moisture permeable pouch 120, 145, 146, respectively. Each individual tobacco portion 156, 157, 158 possesses a sealed outer package 125, 211, 212 that surrounds and contains each respective tobacco portion. Each outer package 125, 211, 212 is tightly sealed, and is selected from an appropriate material, such that the atmosphere 130, 221, 222 within each respective outer package can be controlled. For example, the atmosphere 130, 221, 222 within each respective outer package can be controlled such that the atmosphere is composed of high purity nitrogen gas, or other suitable gaseous species. If desired, this embodiment can be altered to provide that each outer package 125, 211, 212 contains a plurality (e.g., 2, 3 or 4) of individual tobacco portions 156, 157, 158. The packaged individual tobacco

portions 156, 157, 158 are in turn contained within a hard container 165, such as a plastic or metal tin having a lower portion 170 and a corresponding or coordinating upper portion 168. A representative hard container 165 can be the short, rounded edge, generally cylindrical container traditionally used for the marketing of snus types of products. The hard container 165 is in turn tightly sealed, and can possess an optional ring or band of a sealing material 195 that circumscribes the hard container in the area of the seal between lower and upper portions 168, 170. As such, conditions are provided so that the atmosphere 160 within that hard container 165, is controlled (e.g., the atmosphere is composed of high purity nitrogen gas, or other suitable gaseous species).

Alternatively, the hard container 165 can be optionally packaged in a sealed outer package 180, such as in the manner previously set forth with reference to FIG. 3 (e.g., so that the conditions within that outer package, and hence within the hard container, are controlled). In either case, the modified or controlled atmosphere 160 within hard container 165 can be the same or different than the modified or controlled atmospheres 130, 221, 222 of each of the outer packages 125, 211, 212 of the individually wrapped tobacco portions 156, 157, 158 (e.g., the hard container can be packaged within an outer package that provides a type of vacuum seal and the individually wrapped tobacco portions can be wrapped under controlled atmosphere; or the individually wrapped tobacco portions can be packaged within outer packages that provide a type of vacuum seal and the outer package can be wrapped so as to provide internal conditions of controlled atmosphere). In use, the outer package is broken, the hard container is opened, a packaged individual tobacco portion is removed from the hard container, and that packaged portion is opened so that the tobacco portion can be enjoyed by the consumer.

[00029] Referring to FIG. 6, there is shown a sixth embodiment of a representative smokeless tobacco product 110. The tobacco product 110 may include several tobacco compositions (not shown) each contained in a sealed, moisture permeable pouch (not shown). The tobacco compositions and tobacco portions are of the type previously described with reference to FIG. 5. Each individual tobacco portion possesses a sealed outer package 125, 211, 212 that surrounds and contains each respective tobacco portion. Each outer package 125, 211, 212 is tightly sealed, and is selected from an appropriate material, such that the atmosphere (not shown) within each respective outer package can

be controlled (e.g., vacuum sealed). In addition, the atmosphere within each respective package can be controlled such that the atmosphere is composed of high purity nitrogen gas, or other suitable gaseous species. If desired, this embodiment can be altered so that each outer package 125, 211, 212 contains a plurality (e.g., 2, 3 or 4) of individual tobacco portions. The packaged individual tobacco portions within the outer packages 125, 211, 212 are in turn connected to one another in an end-to-end relationship. That is, the individual outer packages 125, 211, 212 each are “fin sealed” along respective sealing regions 270, 271, 272. The fin seal extends longitudinally along the length of each outer package. For the embodiment shown, each fin sealed region 270, 271, 272 may possess 5 “jaw lines.” At each end of outer package 125, and preferably generally perpendicular to the longitudinally extending fin seal, are end seals 131, 132. In addition, there are comparable end seals for each of the other outer packages. For the embodiment shown, the end seal of each outer package may possess 3 “jaw lines.” Between adjacent end seals of each outer package is a line of perforations 305, 306, 307, such that each individual package can be separated from the next. A desired number of the connected outer packages (e.g., 10, 12, 15, 20, 25 or 30) are rolled or wound in a generally spiral manner (e.g., as in a manner generally akin to a spool or roll of postage stamps). The resulting wound series of connected outer packages then is positioned within a suitable container 315. One end of the spooled series of outer packages extends through an opening 320 in the side face of the container 315. As such, the container can hold the spooled product, as well as provide a manner or method for dispensing product therefrom. As such, there is provided a dispenser for an essentially continual strip of smokeless tobacco product (e.g., individual portions of smokeless tobacco composition that are connected together but are separable from one another about individual tearable lines of perforation).

[00030] For the embodiment shown in FIG. 6, the individual packages are connected in an “end-to-end” type of arrangement. If desired, the configuration by which the individual packages can be connected can be altered. For example, rather than sealing the individual outer packages at each end of the length of a smokeless product, the smokeless product can be rotated 90°, and the end seals of the outer package can be

parallel to the length of the smokeless product. As such, individual outer packages for smokeless product can be aligned in a "side-by-side" type of arrangement.

[00031] For the type of embodiment shown in FIG. 6, individual packages that are connected to one another in either an "end-to-end" or "side-by-side" type of arrangement can be incorporated into other types of containers for commercial distribution. For example, a predetermined number (e.g., 4, 5 or 10) of connected but divisible individual outer packages can be incorporated within a package of cigarettes. When incorporated within the cigarette package, it is particularly desirable to have the smokeless product sealed in a controlled atmosphere in order that flavors and aromas do not migrate as between the cigarettes and the smokeless product. In this way product integrity is preserved for each of the jointly packaged products. In one embodiment, cigarettes can be packaged in a so-called "hard pack", having a lid that extends upward beyond the ends of the cigarettes that are contained therein, and a strip of connected individual packages can be positioned within the inner, upper portion of that lid. Exemplary hard pack designs are set forth in US Pat. Nos. 4,852,734 to Allen et al.; 5,139,140 to Burrows et al. and 5,938,018 to Keaveney et al. (For example, a hard pack designed for containing cigarettes having lengths of about 99 mm in a 7-6-7 configuration can be filled with comparable cigarettes having lengths of about 85 mm, and several packaged smokeless tobacco portions can be contained within the inner top region of the movable top lid). Alternatively, several packaged smokeless tobacco portions can be included with a cigarette package by containing those packaged smokeless portions within the polypropylene overwrap that covers the outer regions of the cigarette package. Similarly, packaged smokeless tobacco portions can be connected to a cigarette package by adhesive or by fastening as an insert.

[00032] Referring to FIG. 7, there is shown yet another embodiment of a representative type of smokeless tobacco product 110. The tobacco product 110 includes a tobacco composition 115 contained in a sealed, moisture permeable pouch 120, thereby providing a tobacco portion 122. The tobacco product 110 possesses a sealed outer package 125 that surrounds and contains the tobacco portion 122 in a type of tightly sealed manner. The representative outer package 125 possesses an upper surface 126 and a lower surface 127. The lower surface 127 is suitably adapted so as to possess a so-

called “blister pack” type of format and configuration. As such, the lower surface can have the general shape of a “bubble” having some degree of structural integrity, and hence can be formed to have a generally hemispherical shape, or other desired shape. The outer package 125 is tightly sealed, and is selected from an appropriate material, such that the atmosphere 130 within that outer package is controlled. If desired, the embodiment can be altered in order that the outer package contains a plurality (e.g., 2, 3 or 4) of individual tobacco portions. An edge region 426 about which outer package is tightly sealed (e.g., heat sealed) preferably extends around the bubble region of the blister pack. The edge region can form a shape that is rectangular, square, triangular, hexagonal, circular, or other desired shape. If desired, the edge region 426 of each outer package can have a serrated appearance; can be perforated so as to be connected in a strip or matrix to other outer packages, or can be cut to have the desired visual effect. Preferably, the length of the inner region of the outer package is at least about 10 percent greater than the overall length of the tobacco portion, the width of the inner region of the outer package is at least about 10 percent greater than the overall width of the tobacco portion, and the height of the inner region of the outer package is somewhat greater than the overall height of the tobacco portion. For an exemplary embodiment, a snus-type of product has a maximum length of about 30 mm, a width of about 10 mm to about 12 mm, and a height of about 5 mm to about 6 mm; and the outer package has a length of about 40 mm, a width of about 15 mm and a height of 15 mm; and the end seals of outer package extend around the “bubble” portion at a width of about 5 mm to about 10 mm. Tobacco product so packaged can be employed in the general manner set forth previously with reference to FIG. 1, 2, 5 and 6.

[00033] Tobaccos used for the manufacture of tobacco products pursuant to the embodiments herein may vary. The tobaccos may include types of tobaccos such as flue-cured tobacco, burley tobacco, Oriental tobacco, Maryland tobacco, dark tobacco, dark-fired tobacco and *Rustica* tobaccos, as well as other rare or specialty tobaccos.

Descriptions of various types of tobaccos, growing practices, harvesting practices and curing practices are set forth in *Tobacco Production, Chemistry and Technology*, Davis et al. (Eds.) (1999), which is incorporated herein by reference. See, also, the types of tobaccos that are set forth in U.S. Pat. Nos. 4,660,577 to Sensabaugh, Jr. et al.; 5,387,416

to White et al.; 6,730,832 to Dominguez et al.; and 7,025,066 to Lawson et al., and US Pat. Applic. Serial No. 60/818,198, filed June 30, 2006, to Stebbins et al.; each of which is incorporated herein by reference. Most preferably, the tobacco materials are those that have been appropriately cured and aged. Especially preferred techniques and conditions for curing flue-cured tobacco are set forth in Nestor et al., *Beitrage Tabakforsch. Int.*, 20 (2003) 467-475 and U.S. Pat. No. 6,895,974 to Peele, which are incorporated herein by reference. Representative techniques and conditions for air curing tobacco are set forth in Roton et al., *Beitrage Tabakforsch. Int.*, 21 (2005) 305-320 and Staaf et al., *Beitrage Tabakforsch. Int.*, 21 (2005) 321-330, which are incorporated herein by reference.

[00034] The tobacco used for the manufacture of the tobacco product preferably is provided in a shredded, ground, granulated, fine particulate or powder form. The tobacco used for the manufacture of the tobacco product also can be processed, blended, formulated, combined and mixed with other materials or ingredients. For example, the tobacco composition can incorporate salts, sweeteners, binders, colorants, pH adjusters, fillers, flavoring agents, disintegration aids, antioxidants, humectants, and preservatives. See, for example, those representative components, combination of components, relative amounts of those components and ingredients relative to tobacco, and manners and methods for employing those components, set forth in U.S. Pat. App. Ser. Nos. 11/233,399 to Holton, et al. and 11/351,919 to Holton, et al., each of which is incorporated herein by reference. For example, the tobacco product can have the form of a pouch containing a tobacco composition, and a flavored strip or film; the form of a pouch containing a tobacco composition, and a flavored strip or film incorporating finely divided granules of tobacco and/or tobacco extract (e.g., components of a spray dried aqueous extract of tobacco); or the form of a highly processed dissolvable film incorporating finely divided granules of tobacco and/or tobacco extract. Typically, for certain embodiments, the amount of tobacco material within a portion of an individual portion of a smokeless tobacco can be, on a dry weight basis, at least about 30 mg, often at least about 40 mg, and frequently at least about 45 mg; while that amount typically is less than about 200 mg, often less than about 150 mg, and frequently less than about 100 mg. The tobacco material can have the form of processed tobacco parts or pieces, cured and aged tobacco in essentially natural lamina or stem form, a tobacco extract, extracted

tobacco pulp (e.g., using water as a solvent), or a mixture of the foregoing (e.g., a mixture that combines extracted tobacco pulp with granulated cured and aged natural tobacco lamina).

[00035] The moisture content of the tobacco formulation prior to use by a consumer of the formulation may vary. Typically, the moisture content of the tobacco formulation, as present within the pouch prior to insertion into the mouth of the user, is less than about 55 weight percent, generally is less than about 50 weight percent, and often is less than about 45 weight percent. Certain types of tobacco formulations have moisture contents, prior to use, of less than about 15 weight percent, frequently less than about 10 weight percent, and often less than about 5 weight percent. For certain tobacco products, such as those incorporating snus-types of tobacco compositions, the moisture content may exceed 20 weight percent, and often may exceed 30 weight percent. For example, a representative snus-type product may possess a tobacco composition exhibiting a moisture content of about 25 weight percent to about 50 weight percent, preferably about 30 weight percent to about 40 weight percent.

[00036] The manner by which the moisture content of the formulation is controlled may vary. For example the formulation may be subjected to thermal or convection heating. As a specific example, the formulation may be oven-dried, in warmed air at temperatures of about 40°C to about 95°C, with a preferred temperature range of about 60°C to about 80°C for a length of time appropriate to attain the desired moisture content. Alternatively, tobacco formulations may be moistened using casing drums, conditioning cylinders or drums, liquid spray apparatus, ribbon blenders, mixers available as FKM130, FKM600, FKM1200, FKM2000 and FKM3000 from Littleford Day, Inc., Plough Share types of mixer cylinders, and the like. Most preferably, moist tobacco formulations, such as the types of tobacco formulations employed within snus types of products, are subjected to pasteurization or fermentation. Techniques for pasteurizing or fermenting snus types of tobacco products will be apparent to those skilled in the art of snus product design and manufacture.

[00037] The pH of the tobacco formulation can vary. Typically, the pH of that formulation is at least about 6.5, and preferably at least about 7.5. Typically, the pH of that formulation will not exceed about 9, and often will not exceed about 8.5. A

representative tobacco formulation exhibits a pH of about 6.8 to about 8.2. A representative technique for determining the pH of a tobacco formulation involves dispersing 2 g of that formulation in 10 ml of high performance liquid chromatography water, and measuring the pH of the resulting suspension/solution (e.g., with a pH meter).

[00038] If desired, prior to preparation of the tobacco formulation, the tobacco parts or pieces may be irradiated, or those parts and pieces may be pasteurized, or otherwise subjected to controlled heat treatment. Additionally, if desired, after preparation of all or a portion of the formulation, the component materials may be irradiated, or those component materials may be pasteurized, or otherwise subjected to controlled heat treatment. For example, a formulation may be prepared, followed by irradiation or pasteurization, and then flavoring ingredient(s) may be applied to the formulation. Alternatively, the tobacco formulation can be irradiated or pasteurized after the tobacco formulation has been incorporated within a moisture-permeable packet or pouch (e.g., so as to provide individual containers of snus-type smokeless tobacco product).

[00039] The composition/construction of a moisture-permeable packet or pouch that acts as a snus-type container for use of the tobacco formulation can vary. Suitable packets, pouches or containers of the type used for the manufacture of smokeless tobacco products are available under the tradenames "taboka," CatchDry, Ettan, General, Granit, Goteborgs Rape, Grovsnus White, Metropol Kaktus, Mocca Anis, Mocca Mint, Mocca Wintergreen, Kicks, Probe, Prince, Skruf, TreAnkrare, Camel Snus Original, Camel Snus Frost and Camel Snus Spice. The tobacco formulation may be contained in pouches and packaged, in a manner and using the types of components used for the manufacture of conventional snus types of products. The pouch or fleece provides a liquid-permeable container of a type that may be considered to be similar in character to the mesh-like type of material that is used for the construction of a tea bag. Components of the loosely arranged, granular tobacco formulation readily diffuse through the pouch and into the mouth of the user.

[00040] Descriptions of various components of snus types of products and components thereof also are set forth in U.S. Pat. App. Pub. No. 2004/0118422 to Lundin et al., which is incorporated herein by reference. See, also, for example, U.S. Pat. Nos.

4,607,479 to Linden; 4,631,899 to Nielsen; 5,346,734 to Wydick et al.; and 6,162,516 to Derr, and U.S. Pat. App. Pub. No. 2005/0061339 to Hansson et al.; each of which is incorporated herein by reference. See, also, the representative types of pouches, and pouch material or fleece, set forth in U.S. Pat. No. 5,167,244 to Kjerstad, which is incorporated herein by reference. Snus types of products can be manufactured using equipment such as that available as SB 51-1/T, SBL 50 and SB 53-2/T from Merz Verpackungsmaschinen GmbH. Snus pouches can be provided as individual pouches, or a plurality of pouches (e.g., 2, 4, 5, 10, 12, 15, 20, 25 or 30 pouches) can connected or linked together (e.g., in an end-to-end manner) such that a single pouch or individual portion can be readily removed for use from a one-piece strand or matrix of pouches.

[00041] Although the tobacco composition most preferably is provided in a form that is characteristic of a snus type of product, the tobacco composition also can have the form of loose moist snuff, loose dry snuff, chewing tobacco, pelletized tobacco pieces, extruded tobacco strips or pieces, finely divided ground powders, finely divided or milled agglomerates of powdered pieces and components, flake-like pieces (e.g., that can be formed by agglomerating tobacco formulation components in a fluidized bed), molded processed tobacco pieces, pieces of tobacco-containing gum, products incorporating mixtures of edible material combined with tobacco pieces and/or tobacco extract, products incorporating tobacco (e.g., in the form of tobacco extract) carried by a solid inedible substrate, and the like. For example, the tobacco composition can have the form of compressed tobacco pellets, multi-layered extruded pieces, extruded or formed strands, rods or sticks (for example, a strand, rod or stick having a length of about 3-7 centimeters, preferably about 4-6 centimeters, and a diameter of about 1-5 millimeters, preferably about 2-4 millimeters), compositions having one type of tobacco formulation surrounded by a different type of tobacco formulation, rolls of tape-like films, readily water-dissolvable or water-dispersible films or strips, or capsule-like materials possessing an outer shell (e.g., a pliable or hard outer shell that can be clear, colorless, translucent or highly colored in nature) and an inner region possessing tobacco or tobacco flavor (e.g., a Newtonian fluid or a thixotropic fluid incorporating tobacco of some form).

[00042] Processed tobacco compositions, such as compressed tobacco pellets can be produced by compacting granulated tobacco and associated formulation components,

compacting those components in the form of a pellet, and optionally coating each pellet with an overcoat material. Exemplary granulation devices are available as the FL-M Series granulator equipment (e.g., FL-M-3) from Vector Corporation and as WP 120V and WP 200VN from Alexanderwerk, Inc. Exemplary compaction devices, such as compaction presses, are available as Colton 2216 and Colton 2247 from Vector Corporation and as 1200i, 22001, 3200, 2090, 3090 and 4090 from Fette Compacting. Devices for providing outer coating layers to compacted palletized tobacco formulations are available as CompuLab 24, CompuLab 36, Accela-Cota 48 and Accela-Coata 60 from Thomas Engineering.

Processed tobacco compositions, such as multi-layered tobacco pellets, can be manufactured using a wide variety of extrusion techniques. For example, multi-layered tobacco pellets can be manufactured using co-extrusion techniques (e.g., using a twin screw extruder). In such a situation, successive wet or dry components or component mixtures can be placed within separate extrusion hoppers. Steam, gases (e.g., ammonia, air, carbon dioxide, and the like), and humectants (e.g., glycerin or propylene glycol) can be injected into the extruder barrel as each dry mix is propelled, plasticized, and cooked. As such, the various components are processed so as to be very well mixed, and hence, come in complete contact with each other. For example, the contact of components is such that individual components can be well embedded in the extrusion matrix or extrudate. See, for example, US Pat. No. 4,821,749 to Toft et al., which is incorporated herein by reference.

Certain tobacco compositions can incorporate tobacco as the major component thereof. Preferably, those compositions do not, to any substantial degree, leave any residue in the mouth of the user thereof. Preferably, those compositions do not provide a the user's mouth with slick or slimy sensation (e.g., due to overly high levels of binding agents). Tobacco materials, during processing, can be treated with pH adjusters or other suitable agents, so that natural pectins within the tobacco material can be released. Release of natural tobacco pectin can act to reduce the amount of additional gums/hydrocolloids, cellulose-derived, or starch-based binders needed to aid in desired sheet or film tensile strength qualities. For example, to release pectin, fine tobacco powder is cooked in an alkaline pH adjusted solution at elevated temperatures relative to

ambient. Such treatment also can provide desirable sensory attributes to the tobacco material. See, for example, US Pat. Nos. 5,099,864 to Young et al.; 5,339,838 to Young et al. and 5,501,237 to Young et al.; which are incorporated herein by reference.

[00043] One representative type of individual portion tobacco product possesses an outer shell and an inner region in the form of a tobacco formulation. A representative outer shell can be provided by providing a liquid mixture of alginates (e.g., sodium alginates available as Kelvis, Kelgin and Mannucol from International Specialty Products Corp.), rice starch, sucralose, glycerin and flavoring agent (e.g., mint flavor) in water so as to provide a liquid mix exhibiting a Brookfield viscosity at 25°C of about 20,000 to about 25,000 centipoise. That viscous mixture can be used to form a sheet that can be formed into an outer layer (e.g., using a Villaware Imperia Pasta Machine, Dough Roller 150 equipped with a Villaware Ravioli Attachment for Imperia 150-25, each of which is available through Imperia Trading Company) or semi-circular shells that can be combined (e.g., by exposure to heat) to form an outer layer. Typically, such a viscous mixture can be suitably dried by heating at about 60°C for about 1 hour. Inside that outer shell can be incorporated a wide variety of tobacco formulations. One representative tobacco formulation used as the inner region of such a is a dry or moist mixture of granulated or milled tobacco material that can be mixed with other ingredients, such as flavoring agents, humectants, emulsifiers, fillers, pH adjusters, dispersion aids, and the like. One representative tobacco formulation has the form of a fluid (e.g., the form of a weak gel or soft gel). That tobacco formulation can be provided by mixing granulated or milled tobacco material, kappa-carageenan, Kelvis-type sodium alginate, propylene glycol, polysorbate 60, and flavoring agent (e.g., menthol and cinnamon) in water, such that the moisture content of the formulation is about 40 to about 50 weight percent. One representative tobacco formulation has the form of a fluid. That tobacco formulation can be provided by mixing granulated or milled tobacco material, glycerin, glycerol stearate, propylene glycol, kappa-carageenan, carboxymethylcellulose available as Ticalose 1500 from TIC Gums and micro-crystalline cellulose (e.g., Ticacel HV from TIC Gums) in water, such that the moisture content of the formulation is about 60 to about 70 weight percent.

[00044] The amount of tobacco formulation incorporated within each sealed outer package can vary. In one aspect, loose tobacco composition can be incorporated into an outer package, the package is sealed, and that loose tobacco can be used as loose snuff or chewing tobacco when the outer package is opened. In another, but preferred, aspect, tobacco composition contained within a snus-type pouch or packet is incorporated within the outer package, the package is sealed, and the snus-type product can be used when the outer package is opened. Typically, the amount of tobacco formulation within each individual portion (e.g., within each snus-type pouch) is such that there is at least about 50 mg, often at least about 150 mg, and frequently at least about 250 mg, of dry weight tobacco; and less than about 700 mg, often less than about 500 mg, and frequently less than about 300 mg, of dry weight tobacco. For example, snus-type smokeless tobacco products can have the form of so-called "portion snus."

[00045] One exemplary snus-type product possesses about 1 g of a tobacco formulation having a moisture content of about 35 weight percent; which tobacco formulation is contained in a sealed fleece pouch having an overall length of about 30 mm, a width of about 16 mm, and a height of about 5 mm, wherein the length of the compartment area of that pouch is about 26 mm due to a seal of about 2 mm width at each end of that pouch. Another exemplary snus-type product possesses about 0.5 g of a tobacco formulation having a moisture content of about 35 weight percent; which tobacco formulation is contained in a sealed fleece pouch having an overall length of about 26 mm, a width of about 12 mm, and a height of about 5 mm, wherein the length of the compartment area of that pouch is about 22 mm due to a seal of about 2 mm width at each end of that pouch.

[00046] The outer packaging material useful in accordance with the present invention can vary. Typically, the selection of the packaging material is dependent upon factors such as aesthetics, comfort of handling, desired barrier properties (e.g., so as to provide protection from exposure to oxygen or radiation, or so as to provide protection from loss of moisture), or the like. The packaging material most preferably has the form of a film, such a laminated film (e.g., a co-extruded laminated film). The number of layers present with a laminated packaging material can vary; and can be at least about 3 layers, and often at least about 4 layers; while typically, the number of layers does not

exceed about 10 layers, and often does not exceed about 8 layers. Overall thicknesses of exemplary packaging materials typically are at least about 0.0025 inch, often at least about 0.003 inch; while typically, the thickness of the packaging materials typically is less than about 0.006 inch, and often less than about 0.005 inch. Representative materials that can be used to provide components or layers of film materials or laminated films can include polyvinyl chloride, ethylene vinyl acetate co-polymer, oriented polypropylene, linear low density polyethylene, polyvinylidene dichloride, polyester terephthalate, ethylene methacrylic acid co-polymer, metallacene linear low density polyethylene, and the like. Exemplary packaging materials can be plastic/metal films, plastic/metal films that are paper coated, plastic laminate films, or the like. Such types of materials can be manufactured from materials that make them essentially impervious to oxygen and/or moisture, can be sealed to provide a seal with good integrity, and can provide an outer package that retains or maintains its impervious nature or character over time. Suitable materials are of the type that have been employed as packaging materials for the controlled atmosphere or vacuum packaging of food and pharmaceutical types of products.

[00047] Exemplary other materials useful form providing packaging materials of the present invention preferably include flexible-type plastic materials. See, for example, those polymeric materials, sealants, adhesives, and the like, set forth in US Pat. Pub. No. 2004/0043165 to Van Hulle et al.; which is incorporated herein by reference. For packaging materials that are used for the purpose of preventing contamination of the tobacco composition by oxygen, it is desirable to incorporate an effective amount of suitable reducing agent into the material that provides the inner surface of the packaging material.

[00048] One exemplary laminated film possesses four layers; the top or outer layer being composed of a layer of polyester terephthalate (PET) having a thickness of about 0.00048 inch, a thin layer of adhesive (e.g., a polyurethane-type adhesive available under the tradename Tycel from the Liofol Company), a metal film (e.g., aluminum) having a thickness of about 0.00035 inch, and a bottom layer of an ethylene methacrylic acid containing composition available under the tradename Surlyn from E. I. DuPont de Nemours & Company and having a thickness of about 0.002 inch. If desired, the side of

the PET adjacent the adhesive can be printed with product information using a suitable ink. Another exemplary laminated film possesses three layers; the top or outer layer being composed of a layer of PET having a thickness of about 0.00048 inch, a thin layer of adhesive (e.g., an adhesive available as Tycel), and a bottom layer of a composition available as Surlyn and having a thickness of about 0.002 inch. Another exemplary laminated film possesses four layers; the top or outer layer being composed of a layer of PET having a thickness of about 0.00048 inch, a thin metal film (e.g., aluminum), a thin layer of adhesive (e.g., an adhesive available as Tycel), and a bottom layer composition available as Surlyn and having a thickness of about 0.002 inch. The foregoing representative types of laminated films are suitable for providing so-called “fin sealed” and “three-sided” types of packaging containers having the PET layer as the outer surface of those containers.

[00049] One exemplary laminated film possesses; the top or outer layer being composed of a layer of a material such as Surlyn having a thickness of 0.002 inch, a thin layer of adhesive, a metal film (e.g., aluminum) having a thickness of about 0.00035 inch, a thin layer of adhesive, and a bottom layer of a material such as Surlyn having a thickness of about 0.002 inch. The foregoing representative type of laminated film is suitable for providing so-called “lap seal” types of pouches.

[00050] The present invention can involve the use of equipment, materials, methodologies and process conditions that are suitably modified in order to provide the packaging and controlled atmospheric conditions for the tobacco products that are packaged pursuant thereto. The atmosphere within the packaging materials can be modified in a variety of ways. For example, a significant amount of the atmosphere within the package can be removed (e.g., by using vacuum packaging types of techniques), or the atmosphere within the package can be altered in a controlled manner (e.g., by using gas flushing types of techniques). Representative aspects of various technologies associated with modified atmosphere packaging and controlled atmosphere packaging are set forth in Analysis and Evaluation of Preventative Control Measures for the Control and Reduction/Elimination of Microbial Hazards on Fresh and Fresh-Cut Product; Chapter VI; Microbiological Safety of Controlled and Modified Atmosphere Packaging of Fresh and Fresh-Cut Product; U.S. Food and Drug Administration, Center

for Food Safety and Applied Nutrition (Sept. 30, 2001); which is incorporated herein by reference.

[00051] The controlled or modified atmospheres within packaged tobacco products of the present invention can vary. Typically, when tobacco product is vacuum packed or flushed so as to have a controlled or modified atmosphere (e.g., even if the atmosphere is controlled in a manner such that the atmospheric pressure within the sealed package is at a positive pressure relevant to ambient atmospheric pressure), atmospheric conditions within the package are controlled such that a significant amount, and most preferably virtually all of the oxygen present within with package, is removed from that package prior to the time that the package is sealed. That is, less than about 8 percent, and often less than about 6 percent, of the weight of the controlled atmosphere initially present with a sealed outer package is composed of oxygen. For example, when the package is sealed, the atmosphere present within the package preferably can possess less than about 5 percent oxygen, and most preferably between about 1 percent oxygen and about 5 percent oxygen, based on the weight of the controlled atmosphere initially present within that sealed package. Typically, when the tobacco product is flushed with a gaseous species (e.g., a selected gas or mixture of gases), a significant amount, and most preferably virtually all, of the atmosphere within the sealed package is provided by the desired gaseous species. Exemplary gaseous species include nitrogen, argon, carbon dioxide, and the like (e.g., high purity gases that are greater than about 99 percent pure, by weight). Alternatively, the atmosphere to which the tobacco product incorporates a relatively high level of a desired gaseous species (e.g., oxygen) in order to introduce the effects of "gas shock" to the tobacco product (e.g., relatively high levels of oxygen in the atmosphere can be desirable for the introduction of "oxygen shock" for purposes of inhibiting enzymatic discoloration, preventing anaerobic fermentation reactions, and inhibiting aerobic and anaerobic microbial growth). For example, a controlled atmosphere containing an amount of oxygen such that the level of oxygen in that atmosphere greater than about 25 percent by weight, often greater than about 30 percent by weight, can provide conditions suitable for introduction of oxygen shock.

[00052] Representative equipment useful for carrying out process steps associated with the packaging aspects of the present invention is available from Winpak Ltd. (eg.,

systems identified as LD32, L25, L18 and L12); as Linium 300 Series horizontal flow wrapping systems from Doboy Inc. (e.g., Linium Model Nos. 301, 302, 303, 304 or 305); as Hiwrap 504 systems available from Hitech Systems s.r.l.; and as the types of systems available from Rovema Verpackungsmaschinen GmbH. Preferred equipment provides a wrapping material that provides a seal that does not allow passage of gases or moisture therethrough (e.g., a seal that might be considered as "air tight").

[00053] Representative blister pack packaging materials can vary. Exemplary materials used for the lower layer of a typical blister pack packaging material are laminated polymer films available as Pentapharm alfoil T-250/25/90, Pentapharm ACLAR PA 180/02, Pentapharm ACLAR PA 200/02, and Pentapharm ACLAR PA 300/02, from Klockner-Pentaplast of America, Inc. Exemplary materials used for the upper layer of a typical blister pack packaging material are heat sealable metal films. An exemplary heat sealable film is an aluminum film having a thickness of about 0.0007 inch coated on the sealing side with a heat sealable material (e.g., Surlyn) that has a thickness of about 0.0001 inch. See, also, for example, the types of materials set forth in US Pat. Pub. No. 2004/0043165 to Van Hulle et al.; which is incorporated herein by reference. Although so-called "pealable lid" types of blister packages can be employed, off particular interest are the so-called "push through" types of blister packages.

[00054] If desired, the packaging can be carried out in a controlled environment. That is, pasteurized tobacco product can be packaged in outer packages in a sterile environment.

[00055] Products of the embodiments herein may be packaged and stored in much the same manner that conventional types of smokeless tobacco products are packaged and stored. For example, a plurality of packets or pouches may be contained in a cylindrical container. If desired, moist tobacco products (e.g., products having moisture contents of more than about 20 weight percent) may be refrigerated (e.g., at a temperature of less than about 10°C, often less than about 8°C, and sometimes less than about 5°C). Alternatively, relatively dry tobacco products (e.g., products having moisture contents of less than about 15 weight percent) often may be stored under a relatively wide range of temperatures.

[00056] For preferred embodiments herein, smokeless tobacco composition is packaged in such a manner that there is no requirement for the necessity of refrigeration during periods of transport and prior to sale. That is, shipping, handling and storage can be simplified, and the periods during which shipping, handling and storage are carried out can be prolonged, while the quality of the smokeless product can be maintained. In addition, though the shelf life of the product can be prolonged, thus negating the necessity of refrigeration, the shelf life of refrigerated product also can be prolonged. Product packaged in accordance with the embodiments herein can be stored for prolonged periods of time, while maintaining its overall freshness, maintaining its moisture content, maintaining its visual appearance (e.g., not undergoing significant discoloration), maintaining its sensory properties, not experiencing absorption of undesirable flavors or odors, and not undergoing change in its overall chemical nature due to the action of microbial species. Moist tobacco product (e.g., products having moisture contents of more than about 20 weight percent, and often more than about 30 weight percent) can be stored for prolonged periods of time without the necessity of refrigeration.

[00057] The following examples are provided to illustrate further certain aspects of the embodiments herein, but should not be construed as limiting the scope thereof. Unless otherwise noted, all parts and percentages are by weight.

Example 1

A tobacco formulation in the form of a somewhat flat strip or film is provided in the following manner.

Tobacco material, comprised of a mixture of cured and aged flue-cured, burley and Oriental lamina is provided in a strip or leaf form, and at a moisture of about 9 percent. A portion of this tobacco mixture is washed with water, and the solubles or extractable portion that is collected is discarded, and the remaining water insoluble solids (e.g., pulp portion) is dried. The resulting dried pulp portion then is mixed with the retained untreated portion of the original tobacco mixture. That tobacco mixture then is milled to a particle size that passes through a 150 Tyler mesh screen.

The resulting tobacco mixture is further mixed with other ingredients to form the a formulation that contains about 40 parts of milled tobacco lamina, about 25 parts calcium carbonate, about 15 parts binder (which may be composed of pectin, gelatin, sodium alginate and starch), about 15 parts glycerin, about 4 parts flavoring, and about 1 part sucralose or about 1 part sweetening agent available as SucraSweet HIS 600 from Sweetener Solutions LLC (on a dry weight basis). The binder can be a suitable binding agent (e.g., food grade type binding agent), and exemplary binding agents can be selected from a variety of pectins, gelatins, alginates (e.g., sodium alginate) or starches. The resulting dry mixture is dispersed in deionized water (e.g., about 8 to about 10 parts dry mixture in about 90 to about 92 parts water) to form a slurry that exhibits a Brookfield viscosity of about 20,000 centipoise to 25,000 centipoise at 25 °C.

The slurry is cast as a thick, uniform layer onto a stainless steel drying tray, which can be lightly coated with a non-stick spray before casting the slurry. The tray is placed in a drying oven at relatively low heat (e.g., about 60 °C to about 70°C) for up to about 10 hours (e.g., about 6 to about 8 hours). As such, a formed mixture of tobacco formulation components is provided in a desired shape from an aqueous slurry of those components.

The slurry can be cast in the shape of a strip (e.g., having a length of about 25 cm to about 35 cm) and a width of about 1 cm to about 2 cm. If desired, optional perforation or weakness lines that extend generally perpendicular to the longitudinal axis of the strip can be stamped into the strip at predetermined intervals. The resulting product, which can be formulated and dried so as to be pliable and possess an acceptably high tensile strength, can be coiled and incorporated within the type of container described previously with reference to FIG. 6. That container then can be packaged within an outer package, and under controlled atmospheric conditions, of the general type described previously. In use, the outer package can be opened, and a piece of the long strip of tobacco formulation extending from an opening on the container can be broken off in the desired amount for use.

The slurry can be cast as a sheet or film, and upon drying, individual portions can be stamped, punched or cut from that sheet or film. Thus, for example, rectangular strips or sheets, or circular pieces can be provided from the sheet or film; and packaged

as individual portions (e.g., using outer wrapping material configured in the general manner described previously with reference to FIG. 1).

Cast material that has been dried can be ground into a powder or granulated form, and then packed within a moisture permeable pouch and sealed. Each such pouch can be packaged in an outer package, in the manner described previously with reference to FIG. 1.

Example 2

The smokeless tobacco products that are preferably non-chewable tobacco products that are intended to be placed between the cheek and the gum of the mouth are provided as follows. Preferred smokeless tobacco products, when used orally, completely dissolve in the mouth leaving little to no solid or granular residue, while dispensing or dispersing tobacco components, and while providing a pleasant trigeminal and organoleptic experience.

Cured and/or aged tobacco lamina or stems is provided in a strip or shredded form, and at a moisture content of about 9 percent, or less. Tobacco types can include flue-cure, burley and Oriental tobaccos, and various combinations thereof. In addition, specialty or exotic types of tobaccos, including tobaccos such as Perique and Cavendish, also can be incorporated within blends of tobacco materials. The lamina or stem is milled under cryogenic conditions, or any other suitable dry milling means, to a fine ground form. The powder is sufficiently fine so as to pass through a 150 Tyler mesh screen. The resulting powder then is irradiated with about 5 to about 20 kilo Grays of gamma radiation.

Flue cured tobacco lamina that has been aged is provided in a strip form, and at a moisture content of about 9 percent or less. The lamina is milled under cryogenic conditions or any other suitable dry milling means to a fine ground form. The powder is sufficiently fine so as to pass through a 150 Tyler mesh screen. The resulting powder then is irradiated with about 5 to about 20 kilo Grays of gamma radiation.

The tobacco powder is introduced into a fluidized bed. While in the fluidized bed, the tobacco powder is introduced to a mixture of water and various other ingredients

that have been provided in a dry powder form. The resulting mixture is removed from the fluidized bed, and dried to a moisture content of about 4 percent.

The resulting tobacco formulation is removed from the fluidized bed. A representative formulation contains about 25 to about 40 parts of the granulated flue-cured tobacco lamina, about 0.5 to about 3.0 parts of sucralose (modified sugar), about 1 part titanium dioxide (color modifier), about 10 to about 25 parts calcium carbonate (in the form available as HD PPT Fine from Ruger Chemical), about 15 to about 30 parts mannitol powder, about 2 to about 5 parts powdered cellulose (in the form available as QC-90 from CreaFill Fibers), about 5 to about 15 parts pregelatinized corn starch (in the form available as Starch 1500 from Colorcon), about 3 to about 6 parts povidone (in the form available as PVPK-30 from Xian Medicines & Health Products), and about 0.75 to about 2.5 parts potassium hydroxide. The moisture content of the resulting granulated tobacco formulation is about 4 percent. The resultant granulated tobacco formulation is a dry, free flowing, finely milled powder that is light tan in color, and is made up of particles having an average particle size sufficient to pass through a screen of about 80 Tyler mesh.

A desired amount of the tobacco formulation (e.g., about 0.5 g to about 1 g) of the tobacco formulation can be placed within a sealed fleece pouch, and that pouch can be packaged within an outer package, such as in the general manner set forth previously with reference to FIG. 1.

Example 3

A dry mix of about 200 g to about 225 g of granulated tobacco powder of the type described previously in Example 2, a flavoring agent (e.g., mint flavor) and optionally sodium chloride are mixed for about 5 minutes in a table-top Model P400 Popiel™ Automatic Pasta Maker (available from Ronco Inventions, LLC, Chestworth, CA). Then, about 48 g portion of a premixed warm aqueous solution (e.g., about 40 g water and about 8 g glycerin) is added to the dry mix. Those contents are mixed for about 3 minutes, or until small pea-like size lumps develop. The pea-like mixture is subsequently extruded via selected dies to obtain flat pasta-like sheets (1.4 cm wide x 30 cm length x 0.1 to 0.7 cm depth) or noodle-like cylindrical rods (0.1 to 0.7 cm diameter x 12 to 24 cm

length). The pasta-like sheet is further cut into smaller square or rectangular pieces to obtain pellets that each weigh about 185 mg to about 250 mg. Generally wafer shaped pieces, each weighing about 185 mg to about 250 mg, also can be punched out of the pasta-like sheets. The noodle-like rods are further cut to obtain smaller cylindrical pellet pieces or strands, each weighing about 185 mg to about 250 mg. Generally wafer shaped pieces (e.g., generally cylindrically shaped pieces), each weighing about 185 mg to about 250 mg, also can be cut from extruded cylindrical rods (e.g., a continuous cylindrical extrudate can be cut generally perpendicular to its longitudinal axis). Alternatively, thin cylindrical extrudate can be similarly subdivided to provide somewhat longer, stick-like pieces that weight about 150 mg to about 250 mg. The various shaped pieces are placed onto a stainless steel plate and dried by ambient temperatures for up to about 24 hours (e.g., for about 12 to about 20 hours). Alternatively, the pieces are dried either via forced air ovens operated at about 50°C to about 100°C for up to 15 minutes, or over steam from boiling water baths. The dried products typically exhibit moisture contents of about 5 to about 10 percent. Typical tobacco formulations exhibit, on a dry weight basis, about 85 to about 99 parts of the granulated tobacco powder, about 1 to about 15 parts flavoring agent, and about 1 to about 1.5 parts optional sodium chloride.

The various tobacco formulations can be packaged in the manner set forth previously with reference to FIG. 1 through FIG. 5 and FIG. 7.

Example 4

Tobacco formulations having the general size and shape of those set forth previously in Example 3 are provided, using the types of preparation techniques set forth in Example 3. However, the granulated tobacco powder that is employed in Example 3 is replaced with a finely milled tobacco powder that is prepared as follows.

Flue cured tobacco lamina that has been aged is provided in a strip form, and at a moisture content of about 9 percent or less. The lamina is milled under cryogenic conditions or any other suitable dry milling means to a fine ground form. The powder is sufficiently fine so as to pass through a 150 Tyler mesh screen. The resulting powder then is irradiated with about 5 to about 20 kilo Grays of gamma radiation.

The powdered tobacco lamina and various other dry ingredients are premixed in an automated tumbling mixer for about 15 minutes. As such, on a dry weight basis, a dry mix is prepared from about 122.5 g of the tobacco powder, about 80.5 g cane sugar, about 52.5 g precipitated calcium carbonate, about 17.5 g mannitol, about 48 g rice starch (pregelatinized) and about 1.7 g vanilla flavoring. Then, that dry mix is combined with about 100g of warm water (e.g., at about 30°C to about 45°C) having about 4.6 g of potassium hydroxide dissolved therein in the pasta maker described in Example 3.

Tobacco formulations of the type generally set forth in Example 3 are provided. That is, the tobacco formulations can be formed into desired shapes, such as sheets, strips, pellets, sticks, and the like. The shaped tobacco formulations can be packaged using the types of outer packaging materials set forth hereinbefore.

Example 5

Tobacco formulations are provided in the manner set forth previously in Example 4. However, the tobacco formulation ingredients are formulated as follows. The powdered tobacco lamina described in Example 4, and various other dry ingredients are premixed in an automated tumbling mixer for about 15 minutes. As such, on a dry weight basis, a dry mix is prepared from about 60 g of the tobacco powder, about 50 g cane sugar, about 34 g precipitated calcium carbonate, about 20 g mannitol, about 20 g rice starch (pregelatinized), about 10 g maltodextrin, about 5.2 g microcrystalline cellulose (available as Ticacel HV from TIC Gums), about 0.8 g vanilla flavoring, about 0.5 g menthol and about 3.5 g glycerol tristearate. Then, that dry mix is combined with about 50 g of warm water (e.g., at about 30°C to about 45°C) having about 2 g of potassium hydroxide dissolved therein in the pasta maker described in Example 3.

Example 6

Tobacco formulations are provided in the manner set forth previously in Example 4. However, the tobacco formulation ingredients are formulated as follows. A powdered tobacco lamina is provided from flue-cured and burley tobacco lamina, in the general manner set forth in Example 4. In addition, in the general manner set forth in Example 4, that powdered tobacco lamina, and various other dry ingredients are premixed in an

automated tumbling mixer for about 15 minutes. As such, on a dry weight basis, a dry mix is prepared from about 64 g of the tobacco powder, about 4.4 g of a sweetening agent available as SucraSweet HIS 600 from Sweetener Solutions LLC, about 40 g precipitated calcium carbonate, about 42 g mannitol, about 19 g rice starch (pregelatinized), about 9 g hydroxypropylmethylcellulose available as Klucel EF from Hercules, Inc. and about 5 g microcrystalline cellulose (available as Ticacel HV from TIC Gums). Then, that dry mix is combined with about 50 g of warm water (e.g., at about 30°C to about 45°C) having about 2.5 g of potassium hydroxide and about 8 g glycerin dissolved therein in the pasta maker described in Example 3.

Example 7

Tobacco formulations are provided in the manner set forth previously in Example 4. However, the tobacco formulation ingredients are formulated as follows. A powdered tobacco lamina is provided from flue-cured and burley tobacco lamina, in the general manner set forth in Example 4. In addition, in the general manner set forth in Example 4, that powdered tobacco lamina and various other dry ingredients are premixed in an automated tumbling mixer for about 15 minutes. As such, on a dry weight basis, a dry mix is prepared from about 64 g of the tobacco powder, about 4.4 g of a sweetening agent available as SucraSweet HIS 600 from Sweetener Solutions LLC, about 40 g precipitated calcium carbonate, about 42 g mannitol, about 19 g rice starch (pregelatinized), about 9 g sodium alginate available as Kelvis from International Specialty Products Corp., about 2 g of mint flavoring agent and about 5 g microcrystalline cellulose (available as Ticacel HV). Then, that dry mix is combined with about 40 g of warm water (e.g., at about 30°C to about 45°C) having about 2.5 g of potassium hydroxide and about 8 g glycerin dissolved therein in the pasta maker described in Example 3.

Example 8

A tobacco composition having the form of a multi-layered, multi-flavored, co-extruded pellet is provided as follows.

Granulated tobacco powder and other dry ingredients are again used as described in Example 1, to make a two layered pellet smokeless tobacco formulation. The pellet

can be characterized as having a shape that might be considered to “pillow-type” in nature (i.e., the top, bottom, sides and ends are made up by the outer layer or over layer, and the inner layer is contained within the outer layer).

The inner layer is provided by mixing about 200 g granulated flue-cured tobacco powder, about 6 g sodium chloride and about 1.5 g menthol powder. Then, that dry mix is combined with about 42 g of warm water (e.g., at about 30°C to about 45°C) having about 8 g of glycerin dissolved therein in the pasta maker described in Example 3. The inner layer is generally cylindrical and is made as noodle-like rod.

The outer layer is provided by mixing about 200 g granulated flue-cured tobacco powder, about 5 g sodium chloride and about 14 g of a finely milled burley tobacco powder. The outer layer is made as a pasta-like flat sheet containing more fine tobacco powder, as but less flavoring agent than the inner layer.

To make the smokeless tobacco composition, the pasta-like sheet is wrapped completely around the thin noodle-like rod. The enwrapped rod is then cut into smaller cylindrical pellets, and both cut ends molded or sealed to form small pillow-like pellets, each pellet weighing about 185 mg to about 250 mg. The pellets are ambient temperature dried over about 12 hours, or dried for about 20 minutes in a forced air oven set at about 50°C to about 80°C.

It will be understood that the inner and outer layers may be formulated in various ways; for example one layer may be produced to differ from the other in its level of tobacco sensory properties, such as by varying the level of flavorings or by using differing mixtures of tobacco compositions or formulations. Moreover, in addition to co-extrusion, the multi-layering can also be achieved by physically wrapping a preformed outer layer around a preformed inner layer. Alternatively, an inner layer portion may be laminated between two outer layer portions of slightly larger lateral dimensions, and the outer layers may then be sealed together at their edges to envelop the inner layer.

The tobacco formulation so formed can be packaged within an outer package of the type described previously with reference to FIG. 1.

Example 9

A tobacco composition having the general form of a tape or roll is provided as follows.

Fine tobacco powder containing a mixture of flue-cure and burley is premixed in a tumbling mixer for 15 minutes with other ingredients. As such, a dry mix that is provided contains about 60 g granulated tobacco material, about 3.4 g of a sweetening agent available as SucraSweet HIS 600, about 36 g precipitated calcium carbonate, about 40 g mannitol, about 20 g rice starch (pregelatinized), about 10 g sodium alginate available as Kelvis from International Specialty Products Corp., about 3 g of menthol flavor, about 5 g cinnamon flavor and about 4 g microcrystalline cellulose (available as Ticacel HV). Then, that dry mix is combined with about 42 g of warm water (e.g., at about 30°C to about 45°C) having about 8 g of glycerin and about 2.6 g potassium hydroxide dissolved therein in the pasta maker described in Example 3. The aqueous solution is then gently added to the dry mix in the pasta maker and mixed for 3 minutes or until pea-like size lumps are formed. The blend is then extruded into flat pasta-like sheets of dimension about 1.4 cm wide by about 30 cm long, by about 0.1 cm to about 0.3 cm thick. Each sheet is further perforated at intervals of about 0.5 to about 1.5 cm intervals length-wise to obtain a roll or tape-like product from which square or rectangular pieces can easily be cut off. Samples are preferably not fully dried; and hence, maintain prolonged pliability, elasticity, and tensile strength. The moisture content of the tobacco composition ranges from about 12.5 to about 25 percent.

The tape-like product can be formed into a roll, and positioned within an outer container of the type described previously with reference to FIG. 6. That outer container then can be wrapped with an outer wrapping material, using packaging conditions such as those of the type described hereinbefore.

Example 10

A tobacco composition having the general form of a tape or roll is provided as follows.

Fine tobacco powder containing a mixture of flue-cure and burley is premixed in a tumbling mixer for 15 minutes with other ingredients. As such, a dry mix that is provided contains about 52 g granulated tobacco material, about 2 g of a sweetening

agent available as SucraSweet HIS 600, about 30 g precipitated calcium carbonate, about 27.5 g rice starch (pregelatinized), about 40 g sodium alginate available as Manucol LD from ISP Corporation, about 12 g sodium alginate available as Kelvis from ISP Corporation, about 3 g of menthol flavor, about 5 g cinnamon flavor and about 4 g microcrystalline cellulose (available as Ticacel HV). Then, that dry mix is combined with about 40 g of warm water (e.g., at about 30°C to about 45°C) having about 16 g of glycerin and about 7 g sodium carbonate dissolved therein in the pasta maker described in Example 3. The aqueous solution is then gently added to the dry mix in the pasta maker and mixed for 3 minutes or until pea-like size lumps are formed. The blend is then extruded into flat pasta-like sheets of dimension about 1.4 cm wide by about 30 cm long, by about 0.1 cm to about 0.3 cm thick. Each sheet is further perforated at intervals of about 0.5 to about 1.5 cm intervals length-wise to obtain a roll or tape-like product from which square or rectangular pieces can easily be cut off. Samples are preferably not fully dried; and hence, maintain prolonged pliability, elasticity, and tensile strength. The moisture content the tobacco composition ranges from about 12.5 to about 25 percent.

The tape-like product can be formed into a roll, and positioned within an outer container of the type described previously with reference to FIG. 6. That outer container then can be wrapped with an outer wrapping material, using packaging conditions such as those of the type described hereinbefore.

Example 11

A tobacco composition having the general form of a tape or roll is provided as follows.

A dry mix that is provided contains about 9 g rice starch (pregelatinized), about 20 g sodium alginate available as Manucol LD, about 5 g cinnamon powder and about 3 g menthol powder. Then, that dry mix is combined with about 40 g of warm water (e.g., at about 30°C to about 45°C) having about 16 g of glycerin dissolved therein in the pasta maker described in Example 3. During operation of the pasta maker, about 142 g of granulated tobacco material of the type described in Example 10 is introduced into the pasta maker along with the previously described aqueous mix.

The resulting blend is then extruded into flat pasta-like sheets of dimension about 1.4 cm wide by about 30 cm long, by about 0.1 cm to about 0.3 cm thick. Each sheet is further perforated at intervals of about 0.5 to about 1.5 cm intervals length-wise to obtain a roll or tape-like product from which square or rectangular pieces can easily be cut off. Samples are preferably not fully dried; and hence, maintain prolonged pliability, elasticity, and tensile strength. The moisture content the tobacco composition ranges from about 12.5 to about 25 percent.

The tape-like product can be formed into a roll, and positioned within an outer container of the type described previously with reference to FIG. 6. That outer container then can be wrapped with an outer wrapping material, using packaging conditions such as those of the type described hereinbefore.

Example 12

A tobacco composition having the general form of a tape or roll is provided as follows.

A dry mix that is provided contains about 20 g sodium alginate available as Manucol LD and about 5 g mint flavor. Then, that dry mix is combined with about 50 g of warm water (e.g., at about 30°C to about 45°C) having about 16 g of glycerin dissolved therein in the pasta maker described in Example 3. During operation of the pasta maker, about 195 g of granulated tobacco material of the type described in Example 10 is introduced into the pasta maker along with the previously described aqueous mix.

The resulting blend is then extruded into flat pasta-like sheets of dimension about 1.4 cm wide by about 30 cm long, by about 0.1 cm to about 0.3 cm thick. Each sheet is further perforated at intervals of about 0.5 to about 1.5 cm intervals length-wise to obtain a roll or tape-like product from which square or rectangular pieces can easily be cut off. Samples are preferably not fully dried; and hence, maintain prolonged pliability, elasticity, and tensile strength. The moisture content the tobacco composition ranges from about 12.5 to about 25 percent.

The tape-like product can be formed into a roll, and positioned within an outer container of the type described previously with reference to FIG. 6. That outer container

then can be wrapped with an outer wrapping material, using packaging conditions such as those of the type described hereinbefore.

Example 13

A combination of finely milled flue-cure and burley tobacco powder (e.g., about 25 g) is mixed with about 100 ml of a solution having about 1 g potassium hydroxide in about 100 ml water. The resulting slurry is heated with constant stirring to about 60°C to about 80°C for about 15 minutes. About 1 g of a sweetening agent available as SucraSweet HIS 600 and about 15 g mannitol then are added, and the slurry is held at about 60°C to about 80°C for another 15 minutes, while mixing constantly to obtain a tobacco/water slurry. Meanwhile, a binder system is prepared separately in a Warring blender. About 5 g sodium alginate available as Kelvis is first mixed at high shear with about 200 ml water for 5 minutes, followed by the slow addition of about 20 parts sodium alginate available as Manucol LD, about 7 g rice starch (pregelantinized), about 2 g microcrystalline cellulose available as Ticacel, about 10 g calcium carbonate and about 15 g glycerin, successively, while the blender is operated at medium to high shear speed for approximately another 10 minutes. The binder and tobacco slurry mixtures are then mixed together in the blender at medium to high shear speed for approximately another 5 minutes, with the addition of the about 2.5 g cinnamon and about 1.5 g menthol. After mixing, portions of the final slurry are cast at about 0.1 cm to about 0.3 cm thickness onto a stainless steel plate. The slurries are then dried to form tobacco sheets or films weighing about 95 g to about 125 g per square meter. The sheets are finally cut into smaller square or rectangular pieces, each weighing about 50 mg to about 150 mg. The resulting pieces have the form of relatively slow dissolving strips. Those strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

Example 14

A combination of finely milled flue-cure and burley tobacco powder (e.g., about 25 g) is mixed with about 100 ml of a solution having about 2 g sodium carbonate in about 100 ml water. The resulting slurry is heated with constant stirring to about 60°C to

about 80°C for about 15 minutes. About 1 g of a sweetening agent available as SucraSweet HIS 600 then is added, and the slurry is held at about 60°C to about 80°C for another 15 minutes, while mixing constantly to obtain a tobacco/water slurry. Meanwhile, a binder system is prepared separately in a Warring blender. About 6 g sodium alginate available as Kelvis is first mixed at high shear with about 200 ml water for 5 minutes, followed by the slow addition of about 20 g rice starch (pregelatinized), about 10 g maltodextrin, about 15 g calcium carbonate and about 15 g glycerin, successively, while the blender is operated at medium to high shear speed for approximately another 10 minutes. The binder and tobacco slurry mixtures are then mixed together in the blender at medium to high shear speed for approximately another 5 minutes, with the addition of the about 4.9 g mint flavor. After mixing, portions of the final slurry are cast at about 0.1 cm to about 0.3 cm thickness onto a stainless steel plate. The slurries are then dried to form tobacco sheets or films weighing about 95 g to about 125 g per square meter. The sheets are finally cut into smaller square or rectangular pieces, each weighing about 50 mg to about 150 mg. The resulting pieces have the form of relatively slow dissolving strips. Those strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

Example 15

A combination of finely milled flue-cure and burley tobacco powder (e.g., about 15 g) is mixed with about 100 ml of a solution having about 1.75 g sodium carbonate in about 100 ml water. The resulting slurry is heated with constant stirring to about 60°C to about 80°C for about 15 minutes. About 0.5 g of a sweetening agent available as SucraSweet HIS 600 and about 7.5 g mannitol then are added, and the slurry is held at about 60°C to about 80°C for another 15 minutes, while mixing constantly to obtain a tobacco/water slurry. Meanwhile, a binder system is prepared separately in a Warring blender. About 7.5 g konjac flour available as Nutritol GP 312 from FMC Biopolymers Corporation is first mixed at high shear with about 200 ml water for 5 minutes, followed by the slow addition of about 15 g calcium carbonate, about 0.75 g sodium chloride and about 7.5 g glycerin, successively, while the blender is operated at medium to high shear speed for approximately another 10 minutes. The binder and tobacco slurry mixtures are

then mixed together in the blender at medium to high shear speed for approximately another 5 minutes, with the addition of the about 1.25 cinnamon and about 0.75 g menthol. After mixing, portions of the final slurry are cast at about 0.1 cm to about 0.3 cm thickness onto a stainless steel plate. The slurries are then dried to form tobacco sheets or films weighing about 95 g to about 125 g per square meter. The sheets are finally cut into smaller square or rectangular pieces, each weighing about 50 mg to about 150 mg. The resulting pieces have the form of relatively slow dissolving strips. Those strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

Example 16

A combination of finely milled flue-cure and burley tobacco powder (e.g., about 15 g) is mixed with about 100 ml of a solution having about 1.75 g sodium carbonate in about 100 ml water. The resulting slurry is heated with constant stirring to about 60°C to about 80°C for about 15 minutes. About 0.75 g of a sweetening agent available as SucraSweet HIS 600 then is added, and the slurry is held at about 60°C to about 80°C for another 15 minutes, while mixing constantly to obtain a tobacco/water slurry.

Meanwhile, a binder system is prepared separately in a Warring blender. About 3.5 g sodium alginate available as Kelvis is first mixed at high shear with about 200 ml water for 5 minutes, followed by the slow addition of about 9.5 g rice starch (pregelatinized), about 5 g maltodextrin, about 5 g calcium carbonate, about 0.75 g sodium chloride and about 7.5 g glycerin, successively, while the blender is operated at medium to high shear speed for approximately another 10 minutes. The binder and tobacco slurry mixtures are then mixed together in the blender at medium to high shear speed for approximately another 5 minutes, with the addition of the about 1.25 cinnamon and about 0.75 g menthol. After mixing, portions of the final slurry are cast at about 0.1 cm to about 0.3 cm thickness onto a stainless steel plate. The slurries are then dried to form tobacco sheets or films weighing about 95 g to about 125 g per square meter. The sheets are finally cut into smaller square or rectangular pieces, each weighing about 50 mg to about 150 mg. The resulting pieces have the form of relatively slow dissolving strips. Those

strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

Example 17

About 50 g of a granulated tobacco powder is mixed with about 100 ml of water in a Warring blender at low shear speed for about 5 minutes to obtain an aqueous tobacco slurry. Meanwhile a binder system is prepared in a separate blender by mixing about 5 g sodium alginate available as Kelvis with about 200 ml water at high shear speed for about 5 minutes. About 15 g sodium alginate available as Manucol LD and about 5 g hydroxypropylcellulose available as Klucel EF are slowly added, successively, as the slurry is mixed for approximately another 5 minutes. About 7.5 g glycerin is then added to the binder system and the slurry mixed for another 5 minutes. The aqueous tobacco slurry and binder systems are then mixed together for another 5 minutes at medium to high shear speed with the addition of about 2 g mint flavor. The final slurry is subsequently cast, dried, and cut into thin film strips. Those relatively slow dissolving strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

Example 18

About 50 g of a granulated tobacco powder is mixed with about 100 ml of water in a Warring blender at low shear speed for about 5 minutes to obtain an aqueous tobacco slurry. Meanwhile a binder system is prepared in a separate blender by mixing about 6 g sodium alginate available as Kelvis with about 200 ml water at high shear speed for about 5 minutes. About 10 g sodium alginate available as Manucol LD is slowly added, as the slurry is mixed for approximately another 5 minutes. About 14 g glycerin is then added to the binder system and the slurry mixed for another 5 minutes. The aqueous tobacco slurry and binder systems are then mixed together for another 5 minutes at medium to high shear speed with the addition of about 5 g mint flavor. The final slurry is subsequently cast, dried, and cut into thin film strips. Those relatively slow dissolving strips can be individually packaged in outer packaging materials of the type described previously with reference to FIG. 1.

What is claimed is:

1. A smokeless tobacco product comprising:
a water-permeable pouch containing a tobacco formulation and configured for insertion into the mouth of a user of that product the tobacco formulation including granular tobacco, and
an outer packaging material enveloping said pouch and being sealed so as to allow a controlled environment to be maintained within.
2. The smokeless tobacco product of claim 1 including a plurality of said water-permeable pouches enveloped by said outer packaging material.
3. The smokeless tobacco product of claim 2 wherein one edge of said outer packaging material is contiguous with two sides of said outer packaging material, the other three edges of said outer packaging material being sealed.
4. The smokeless tobacco product of claim 1 wherein the seal on said outer packaging material is a fin-seal.
5. The smokeless tobacco product of claim 2 including a hard container encompassing said outer packaging material, said hard container constructed so it can be opened and resealed to allow one or more of said water permeable pouches to be dispensed as desired by the user.
6. The smokeless tobacco product of claim 5 wherein said hard container is made of metal or plastic.
7. A smokeless tobacco product comprising:
a plurality of water-permeable pouches each configured for insertion into the mouth of a user of the product and containing a tobacco formulation, the tobacco formulation including granular tobacco,
a hard container encompassing said water-permeable pouches, and an outer packaging material enveloping said hard container and being sealed so as to allow a controlled environment to be maintained within.
8. The smokeless tobacco product of claim 7 wherein said hard container can be opened and resealed to allow one or more of said water permeable pouches to be dispensed as desired by the user.

9. The smokeless tobacco product of claim 8 wherein said hard container is made of metal or plastic.

10. The smokeless tobacco product of claim 7 wherein said outer packaging material is formed of two pieces of said material superimposed in edge to edge contact, said edges being sealed by an overlap seal.

11. A smokeless tobacco product comprising:
a plurality of water-permeable pouches containing a tobacco formulation and configured for insertion into the mouth of a user of that product, the tobacco formulation including granular tobacco, and

a hard container encompassing said water-permeable pouches, said hard container being tightly sealed so as to allow a controlled environment to be maintained within.

12. The smokeless tobacco product of claim 11, said hard container comprising a lower portion and a separate, upper portion which mates with said lower portion to form a closed container, and a band of sealing material covering the mating surfaces of said upper and lower portions.

13. The smokeless tobacco product of claim 11 wherein said container is made of metal or plastic.

14. A smokeless tobacco product comprising:
a plurality of water-permeable pouches each containing a tobacco formulation and configured for insertion into the mouth of a user of that product, the tobacco formulation including granular tobacco;

an outer packaging material enveloping each of said pouches and being sealed so as to allow a controlled environment to be maintained within; and

a hard container encompassing said water-permeable pouches enveloped by said outer packaging material, said hard container being tightly sealed so as to allow a controlled environment to be maintained within.

15. The smokeless tobacco product of claim 14, said hard container comprising a lower portion and a separate, upper portion which mates with said lower portion to form a closed container, and a band of sealing material covering the mating surfaces of said upper and lower portions.

16. The smokeless tobacco product of claim 14 wherein said container is made of metal or plastic.

17. The smokeless tobacco product of claim 14 wherein the controlled environment maintained within said outer packaging material enveloping each of said pouches is different from the controlled environment maintained within said hard container.

18. A smokeless tobacco product comprising:
a plurality of water-permeable pouches each containing a tobacco formulation and configured for insertion in the mouth of a user of that product, the tobacco formulation including granular tobacco;
an outer packaging material enveloping each of said pouches and being sealed so as to allow a controlled environment to be maintained within;
a hard container encompassing said water-permeable pouches enveloped by said outer packaging material; and
a second outer packaging material enveloping said hard container and being sealed so as to allow a controlled environment to be maintained within.

19. The smokeless tobacco product of claim 18 wherein the controlled environment maintained within said outer packaging material enveloping each of said pouches is different from the controlled environment maintained within said second outer packaging material.

20. A smokeless tobacco product comprising:
a plurality of water-permeable pouches each containing a tobacco formulation and configured for insertion into the mouth of a user of that product, the tobacco formulation including granular tobacco;
an outer packaging material enveloping at least one of each of said pouches and being sealed so as to allow a controlled environment to be maintained within; and
the outer packaging material enveloping each of said one or more pouches being interconnected to form a tape-like assembly.

21. The smokeless tobacco product of claim 20 wherein the interconnections between the outer packaging material enveloping each of said one or more pouches are adapted to be readily separated for use by said user.

22. The smokeless tobacco product of claim 21 wherein said interconnections each contain a line of perforations to facilitate separation.

23. The smokeless tobacco product of claim 20 wherein said tape-like assembly is rolled up to facilitate handling by the user.

24. The smokeless tobacco product of claim 23, wherein said rolled up tape-like assembly is packaged in a dispenser constructed to allow said tape-like assembly to be withdrawn and separated for use by said user.

25. The smokeless tobacco product of claim 23 wherein said dispenser is cylindrical in shape.

26. The smokeless tobacco product of claim 24 including a second outer packaging material enveloping said dispenser and being sealed so as to allow a controlled environment to be maintained within.

27. A smokeless tobacco product comprising:
a tobacco formulation having a tape-like form and being rolled up to facilitate handling by the user,
said rolled up tape-like tobacco formulation being packaged in a dispenser constructed to allow said tape-like tobacco formulation to be withdrawn and separated into parts for use by said user.

28. The smokeless tobacco product of claim 27 having an outer packaging material enveloping said dispenser and being sealed so as to allow a controlled environment to be maintained within.

29. A smokeless tobacco composition having a form that is not intended to be smoked, that composition comprising at least two tobacco formulations, wherein:

(i) a first tobacco formulation is a processed mixture incorporating components that include tobacco and binding agent, said processed mixture being provided by contacting the components in water; and

(ii) the first tobacco formulation is formed so as to overly a second tobacco formulation.

30. The smokeless tobacco composition of claim 1 wherein the first tobacco formulation is formed into one or more sheet-like shapes that are adapted to enwrap the second tobacco formulation.

31. The smokeless tobacco composition of claim 1 wherein the first tobacco formulation incorporates components that possess one type of sensory characteristics, and the second tobacco formulation incorporates components that exhibit a different type of sensory characteristics.

32. The smokeless tobacco composition of claim 2 wherein said second tobacco formulation is in the shape of a rod.

33. The smokeless tobacco composition of claim 4 wherein the enwrapped said rod is cut into cylindrical pellets, and then both cut ends of each pellet are molded or sealed to form pillow-like pellets.

34. The smokeless tobacco composition of claim 5 wherein said pillow-like pellets are dried at ambient temperature for about 12 hours.

35. The smokeless tobacco composition of claim 5 wherein said pillow-like pellets are dried for about 20 minutes in a forced air oven at about 50° C to about 80° C.

36. A smokeless tobacco formulation having a form that is not intended to be smoked, that tobacco formulation comprising a processed mixture incorporating tobacco and alginate binder, said processed mixture being provided by contacting the components in water to provide a mixture, forming that mixture and removing moisture from that mixture.

37. The smokeless tobacco formulation of claim 8 wherein the forming is carried out using casting techniques.

38. The smokeless tobacco formulation of claim 8 wherein the forming is carried out using extrusion techniques.

39. The smokeless tobacco formulation of claim 8 further incorporating glycerin.

40. The smokeless tobacco formulation of claim 8 further incorporating a pH adjuster.

41. The smokeless tobacco formulation of claim 8 further incorporating at least one polysaccharide.

42. The smokeless tobacco formulation of claim 8 further incorporating a sweetening agent.

43. The smokeless tobacco formulation of claim 8 further incorporating a filler.

44. The smokeless tobacco formulation of claim 8 further incorporating a starch-based material.

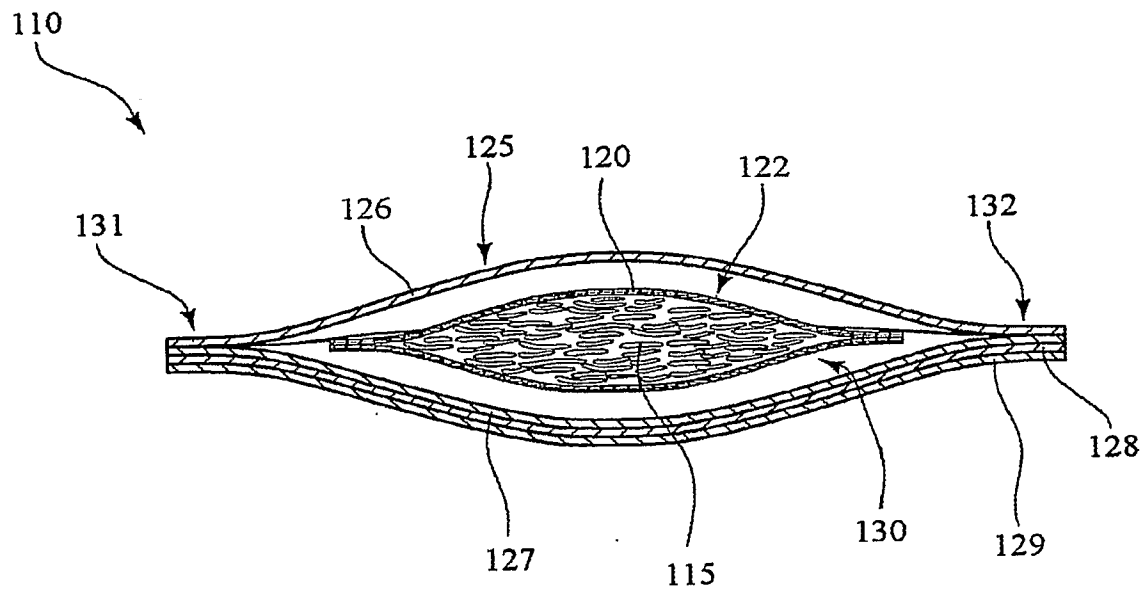


FIG. 1

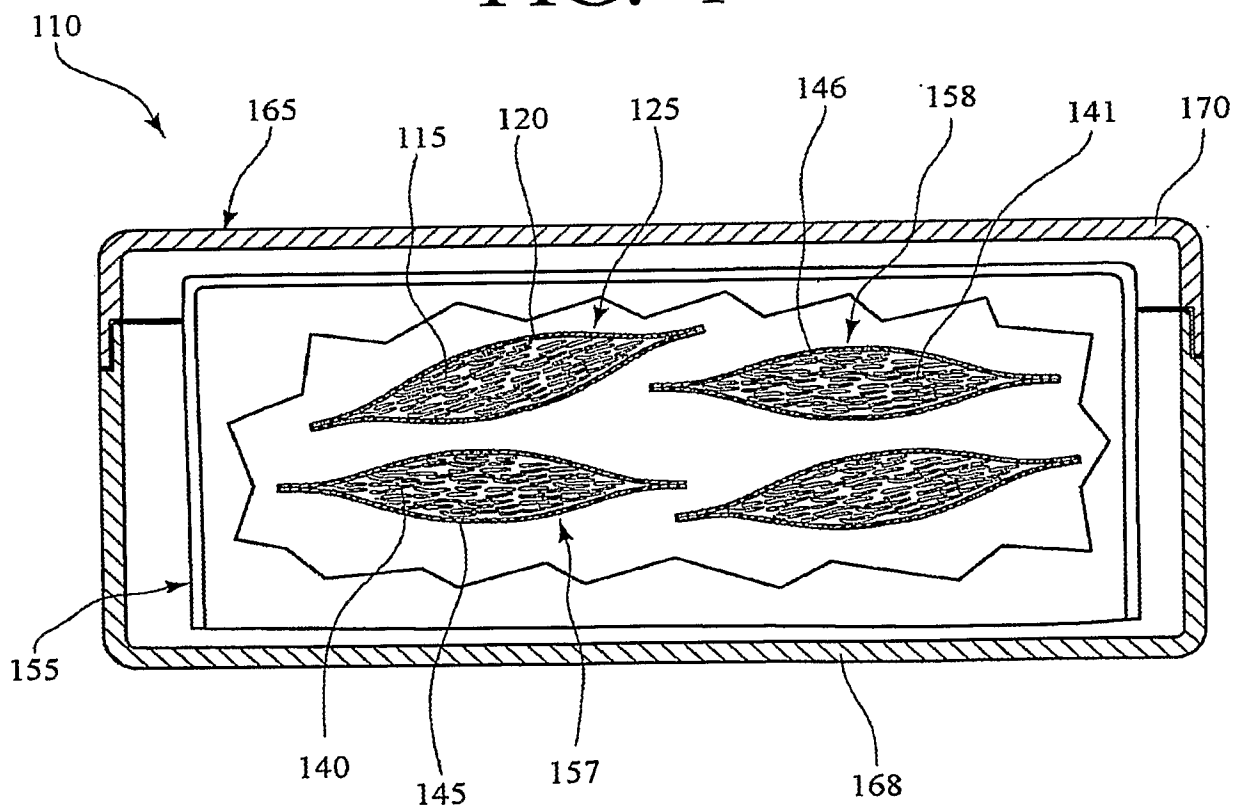


FIG. 2

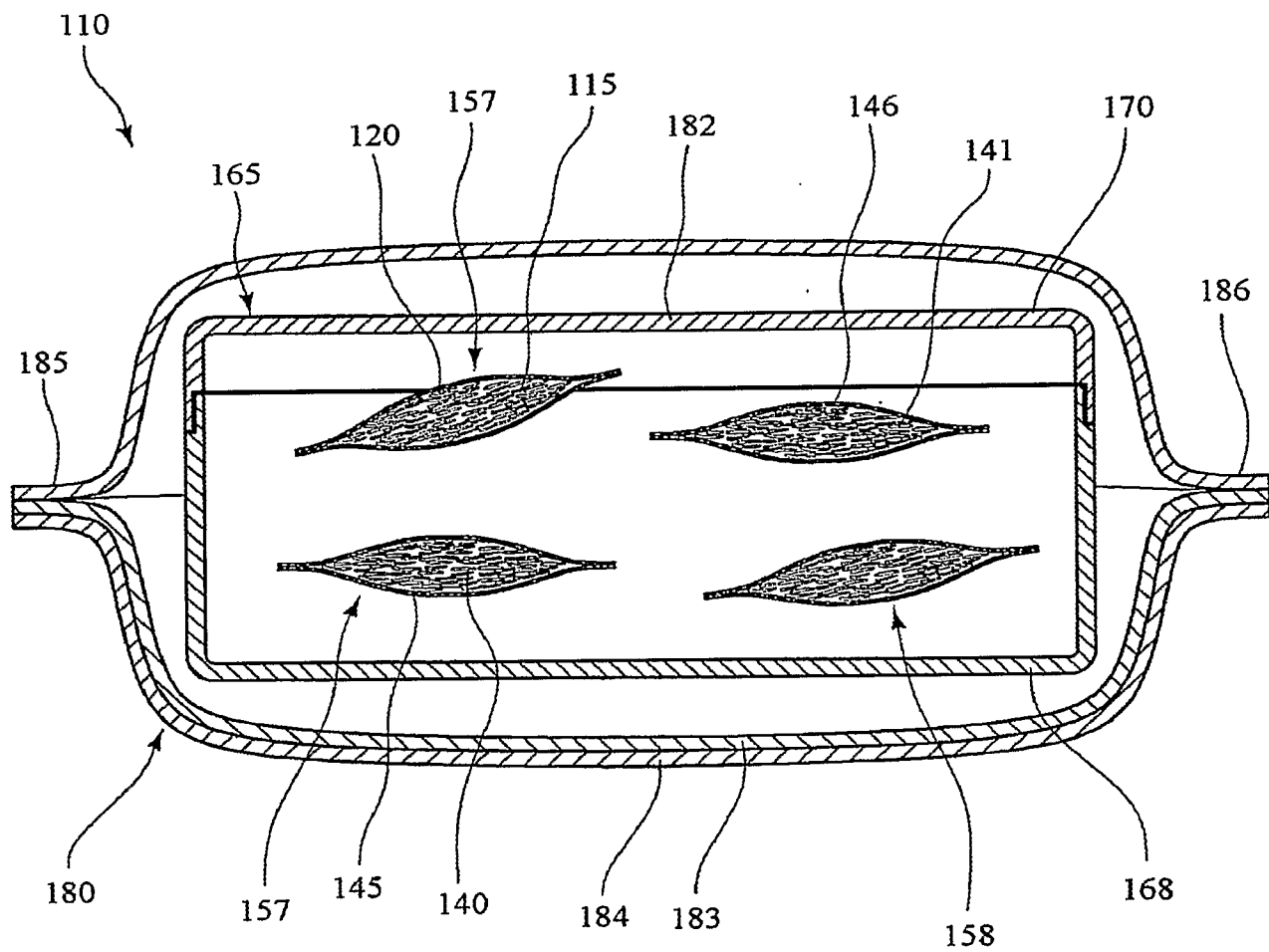


FIG. 3

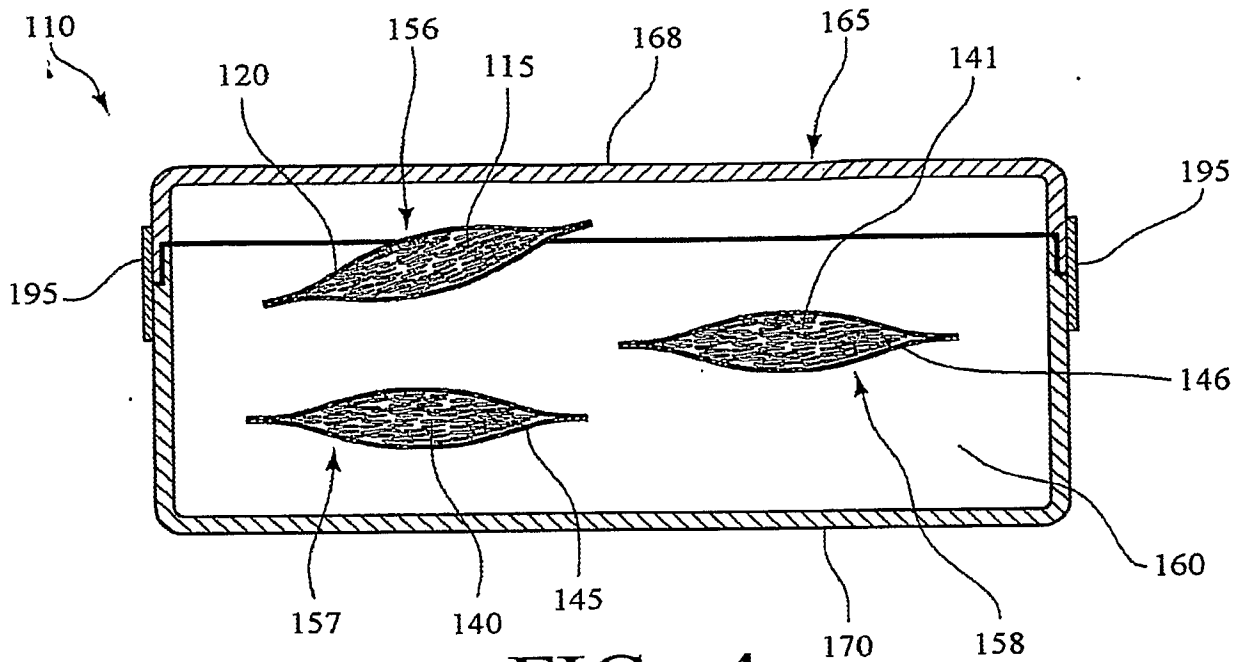


FIG. 4

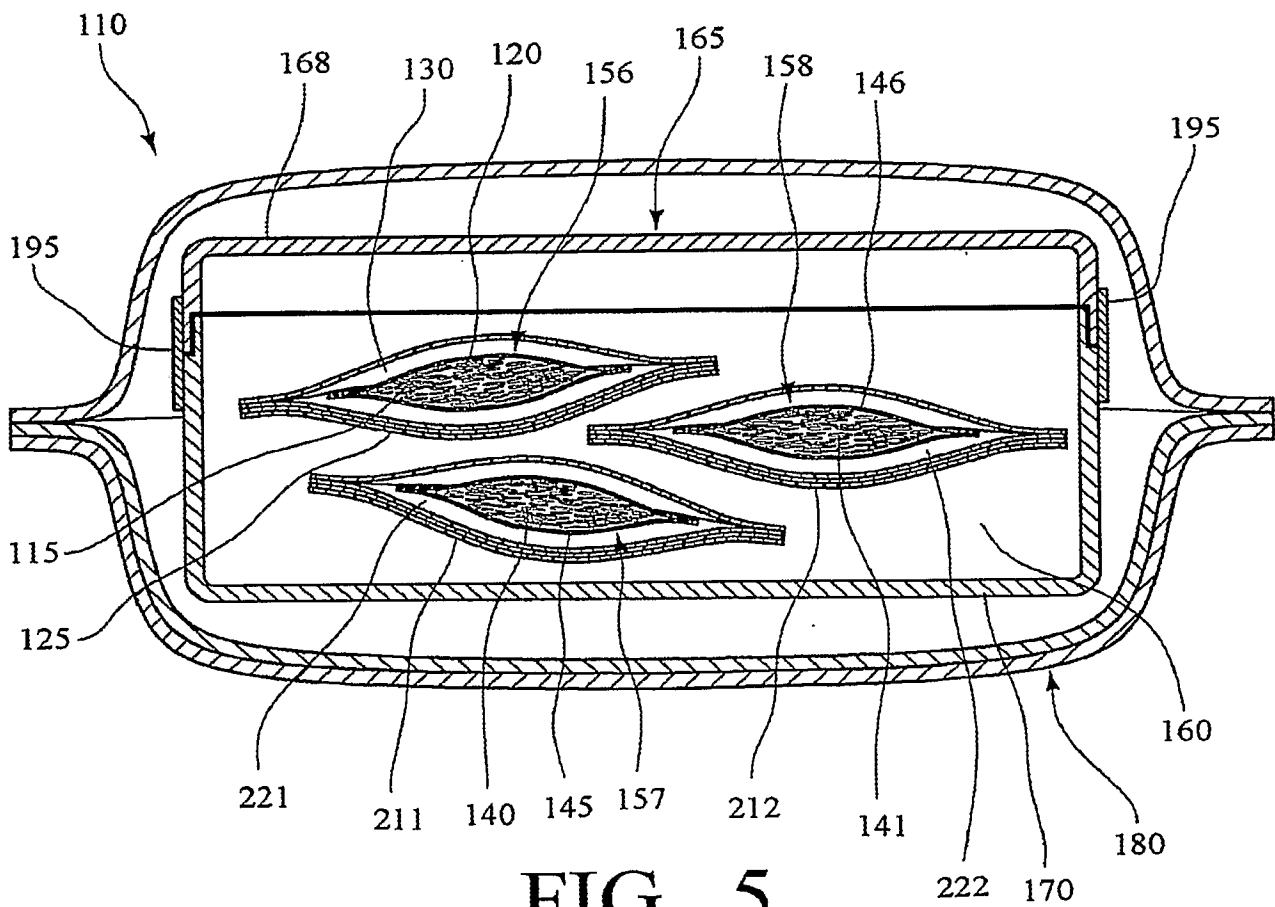


FIG. 5

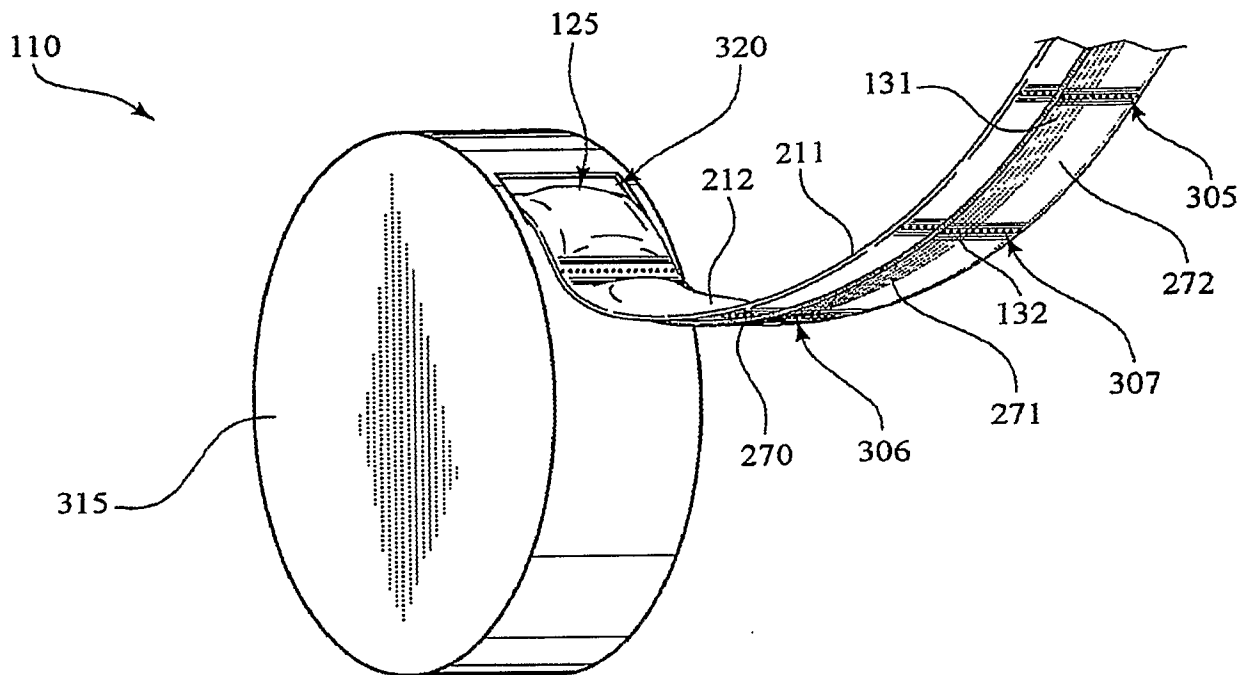


FIG. 6

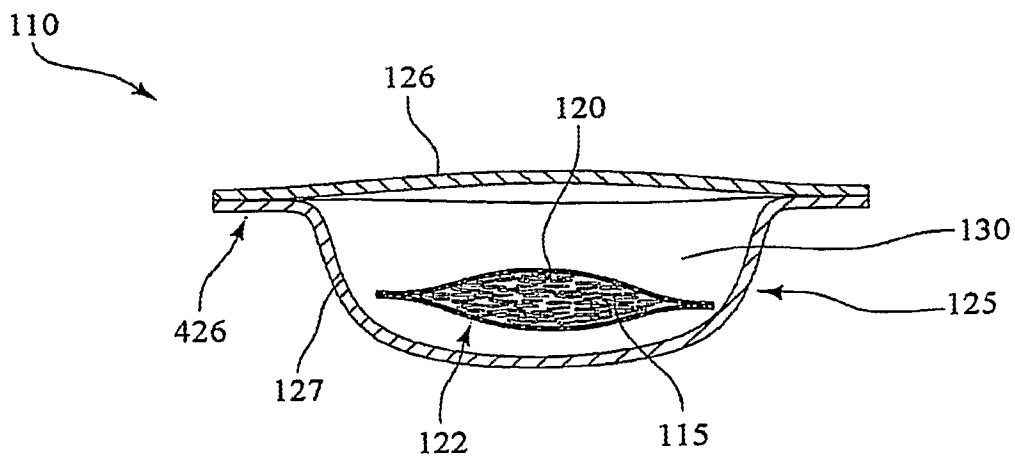


FIG. 7