(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 145 424**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **84308340.3**

(22) Date of filing: **30.11.84**

(51) Int. Cl.⁴: **A 24 B 15/16**

(30) Priority: **02.12.83 US 557426**

(43) Date of publication of application: **19.06.85**
Bulletin 85/25

(84) Designated Contracting States: **AT BE CH DE FR GB IT LI LU NL SE**

(71) Applicant: **WOOLERY-ROSEN ASSOCIATES, Beaver Hill Apts. North Building, Jenkintown Pennsylvania 19046 (US)**

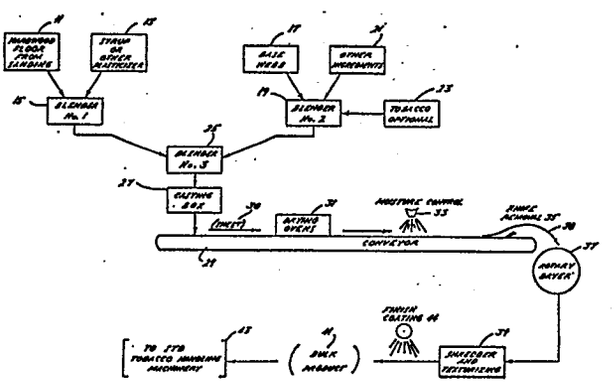
(72) Inventor: **Rosen, William E., 2055 Wisteria Lane, Lafayette Hill Pennsylvania 19444 (US)**

(74) Representative: **Colgan, Stephen James et al, CARPMAELS & RANSFORD 43 Bloomsbury Square, London WC1A 2RA. (GB)**

(54) Non-tobacco smoking product.

(57) A non-tobacco smoking product is manufactured from a slurry which is cast into sheets and dried and then cut and mechanically worked to resemble various grades of cigarette or other natural smoking tobacco. A base web or binder material is first prepared. A flavor and aroma providing materials, as well as, combustion and ash forming agents, physical characteristic adjusting agents and finish and color agents are thereafter mixed in various proportions to make the product slurry.

A tobacco-like tensile strength permits standard cigar tobacco wrapper manufacturing machinery and standard tobacco handling, standard cigarette packing and standard cigar making equipment to be used handling the non-tobacco smoking product when making cigarettes, cigars or pipe tobacco-substitute products. The manufacturing process for the product may include spraying a finish coating to add to the moisture and aroma of the manufactured sheet, either before or after cutting and mechanical working. The finished non-tobacco product resembles tobacco in aroma, taste, appearance, burn, and smoking moistness. The non-tobacco product may be mixed with tobacco to form a composite product, if desired, or the finished non-tobacco product may later be mixed with tobacco in packaging.



EP 0 145 424 A2

NON TOBACCO SMOKING PRODUCT

DESCRIPTION

BACKGROUND OF THE INVENTION

This invention relates to tobacco substitute smoking materials intended to be used as tobacco replacement or supplement. More specifically, it relates to such materials which are intended to have physical and smoking characteristics close, if not identical, to that of real tobacco.

Processed cellulosic material has been developed as a substitute smoking material, as a tobacco replacement or a tobacco supplement. However, alpha-cellulose and other types of cellulosic material in untreated form have been found to be unsatisfactory either as to their burning characteristics or as to other physical properties.

Cellulose oxidized by treatment with nitrogen dioxide is shown in Patent USPN 3,461,879. Here oxidation of primary hydroxyl groups of the cellulose molecule to form carboxyl groups is performed.

Heat treated cellulosic materials are also shown in USPN 3,705,589 and 3,545,448. USPN 3,807,414 relates to untreated cellulose in combination with other materials.

A fluid obtained by boiling resin in a solvent of NaCl and by boiling the same in a solvent of $NaHCO_3$ and a solution of organic salt of iron is used for treating tobacco leaves or plant pulp or cellulose as shown in USPN 1,334,752.

A smokable tobacco substitute using eucalyptus leaves which have been treated with NNO_3 and mixed with glycerine or honey or molasses is shown in USPN 1,680,860.

Wood pulp can be made into paper sheets and soaked with tobacco extract as shown in USPN 2,576,021. Sugar cane pulp fibers once the sugar ladened juice has been pressed therefrom,

cotton, linen, sisal and other similar fibers which have compositions similar to tobacco with respect to cellulose fats, waxes or gums are also used when treated with sodium hydroxide or other alkali. Taste, aroma and color additives are then added.

USPN 2,907,686 relates to a charcoal tobacco substitute which includes as a carrying agent Fuller's Earth or natural or activated clay including aromatic flavoring agents such as vanilla, eucalyptus oil or isoamyl isovalerate. Glycerol or Glycerol monoacetate may be added. An ash forming agent, e.g. $ZnCl_2$, $Ca(OH)_2$, KOH or K_2CO_3, MgO, Al_2O_3. Coating agents, e.g. sugar solutions or hard gum or resin may also be used.

A tobacco substitute base extracted from plant leaves with water or an organic solvent with many additives listed is shown in USPN 3,369,551. Dry materials are toasted to a golden brown color and treated with appropriate additives.

USPN 3,461,879 relates to a tobacco substitute of oxidized cellulose in combination with a hydrated metal compound, such as magnesium citrate, hydrated alumina, calcium tartrate or magnesium sulfate.

A smoking material comprising a carbohydrate material, such as cellulose which is thermally degraded at 100 to 250°C, is shown in USPN 3,545,448. The material is processed in the presence of a strong mineral acid catalyst until a weight loss of at least 10% has occurred. Carbohydrate materials reduced include alpha-cellulose, and cellulose derivatives such as methyl cellulose, and various polysaccharides and gums.

USPN 3,556,109 relates to smoking materials made from 100% wood pulp cellulose with 1 to 30% mild organic acid added in the presence of a calcium, magnesium, barium or strontium salt.

USPN 3,556,110 relates to a method of making oxidized cellulose as a smoking material when treated with a dilute solution of an organic acid to produce purified pulp by removing sugars, protein, chlorophylls, flavones, colors, oils, waxes and resins.

USPN 3,559, 655 relates to a process for manufacturing a smoking material from oxidized cellulose to contain a mineralizing agent in the form of strontium or barium oxalate, lactate, glycolate, diglycolate or pivalate in the amount of 5 to 40%, by weight.

USPN 3,612,063 relates to a smoking material made of oxidized cellulose combined with organic salts of potassium, lithium and copper such as oxalic, lactic, glycolic, diglycolic, pivalic or tannic acid salts with titanium dioxide.

USPN 3,638,660 relates to a tobacco substitute material prepared from fibrous wood pulp containing at least 90% alpha-cellulose which is formed into a sheet having a density of 12 to 35 lbs. per cubic foot. Certain combustion modifiers such as potassium sulfate, sodium sulfate, magnesium sulfate, magnesium chloride and potassium chloride or carbonates or bi-carbonates of sodium potassium, magnesium and aluminum as well as potassium nitrate, ferric oxide, ferric hydroxide, alumina and citrates and acetates of magnesium and glyconic acid are suggested.

USPN 3,640,285 relates to a cigarette paper containing calcium oxalate or certain other alkaline earth metal salts of organic acids.

USPN 3,720,660 relates to cellulose and polysaccharides which are oxidized by strong acids.

Reconstituted tobacco sheet, formed while the sheet is wet and carried by a rotating support roller to produce a crepe in the sheet, is shown in USPN 3,430,634.

USPN 3,840,024 relates to a reconstituted tobacco material containing bilbulous fibers in the range of 5 to 25%, by weight, which fibers are water insoluble and wet cross-linked derivatives of carboxymethyl cellulose.

USPN 3,812,864 relates to a smoking material of vinyl methyl ether being maleic anhydride copolymers with inorganic materials such as calcium carbonate. Combustible material is added such as tobacco dust, cellulose, pectins or natural gums.

USPN 3,840,026 discloses a method of treating cured tobacco to improve taste, aroma, feel and color involving a treatment with calcium or magnesium porous silicous material carried in a gel or used in a talc or absorbent clay such as diatomite.

USPN 3,851,653 relates to a method of treating tobacco to increase volume and reduce nicotine. An amount of hydrogen peroxide and catalase is added to the tobacco.

USPN 4,328,816 relates to mechanical working under steam conditions of reconstituted tobacco to shatter and wrinkle a reconstituted tobacco sheet.

USPN 3,871,390 relates to heating cellulose to 100-300°C to obtain a degradation of 55 to 30%, by weight, to produce a carbonized cellulose with a morganic filler such as hydroxide to form a slurry which is then cast into a sheet.

USPN 4,333,484 shows an improved smoking material comprising cellulosic material, made from an aqueous slurry of slightly beaten fibers. Calcium, magnesium, iron or aluminum salts are added to the slurry which is thereafter cast, dried, conditioned and slit. About 5-40% and preferably 10-30% by weight of the product is the added salts. Modified cellulose gum may also be added.

While the above identified prior art, in one patent or another, mentions or suggests many, and, as a collection, most substances which can be used in the manufacture of tobacco products and non-tobacco products, a combination which produces an acceptable and therefore successful natural tobacco smoking substitute, manufactured product has not been found. The consumer marketplace will support that a more successful combination of ingredients, or a variation or particular form of an ingredient(s), has yet to be offered.

An object of this invention is to provide a non-tobacco product with burning and ashing characteristics very similar to natural tobacco.

Another object is to provide such a product with taste and aroma characteristics similar to natural tobacco.

Another object is to provide such a product which exhibits looks, feel, texture and mechanical strengths very similar to natural tobacco.

A further object is to provide a process for manufacturing such a non-tobacco product.

SUMMARY OF THE INVENTION

The objects of this invention are realized by a non-tobacco smoking product usuable as a tobacco substitute or tobacco supplement which is made using any of a variety of cellulosic containing materials exhibiting desirable burn, aroma and taste characteristics such as hardwood flour, i.e. oak or maple, obtained by sanding, coffee, such as the freeze dried variety, and chickory.

An initial slurry is formed from a cellulose base and gum materials to generate the binder or "base web" material for making a "sheet" of product. To this slurry is added other ingredients which may include any of combustion control and ash forming agents, such as calcium carbonate, titanium dioxide; and an inert filler, other combustion, aroma, taste and ash contributing materials, such as coffee, chickory, hardwood flour and other flavor and color agents to form a completed slurry.

The slurry is then cast into a sheet and dried into sheet material of desired thickness. The sheet may be tempered to a desired moisture range and then dried again before being mechanically worked to provide proper texture. The sheet is also dried into squares, which are in turn shredded into elongate pieces. These elongate rectangular pieces approximate natural tobacco filler material for cigarette, cigar and pipe smoking uses.

Flavor and aromatic qualities of the product approach that of natural tobacco, as well as, do its appearance, burn and ash formation, and also mechanical strength, texture and weight.

DETAILED DESCRIPTION OF THE DRAWINGS

The advantages, features and structure of the invention will be better understood from a reading of the following detailed description of the invention which can be read in connection with the accompanying drawings of which like numerals refer to like elements and of which:

Figure 1 shows a block diagram for the process for manufacturing the product; and

Figure 2 shows a block diagram for the process for manufacturing the principal embodiment of the product.

DETAILED DESCRIPTION OF THE INVENTION

A non-tobacco smoking product usable as a tobacco substitute or as a tobacco supplement is provided. The product is made into sheets which can be texturized and shredded into a bulk product which may then be handled with standard and commonly available tobacco handling equipment for making cigarette-like, cigar-like, or packaged pipe smoking products. The product of the invention has color, flavor, aroma, texture, tensile strength smoking or burning and ash forming characteristics approaching those of class 1, grade A, "gold" natural tobacco.

A "base web", available in the market place from such smoking product filler and paper manufacturers as Microflake, Inc. of South Windsor, Connecticut, is incorporated as a filler/binder to add bulk and constitutes approximately 14-30%, by weight, of the ingredients of the composition comprising the product. This base web is made from loose and slightly beaten cellulosic material suspended in a binder and castable into sheet form. It usually includes soft wood pulp to which triethylene glycol, guar gum, methythydroxytropyl cellulose, ethyhdroxyethl cellulose, phosphoric acid, trimethylether of trimethylol melamine are added.

Typically, this base web source of cellulose is wood pulp, but sisal, sugar cane pulp, cotton, etc. can also be used. They are beaten to break up the fibers and then are subjected to an acid or caustic solution to further reduce the fibers and to eliminate tars, gums, waxes, sugars and fats and to leave a fibrous pulp residue. A controlled quantity of binder material, such as natural gums, i.e. guar gum, is then added. Often glycerine or glycerol is also added so that the mixture is cast and dried into sheet form.

As an alternative to this base web, a highly refined base web, (H.R. base web) consisting of the cellulosic material and gums, but without the soft wood pulp may be used.

A first form of the product contains hard wood flour as an ingredient. This important ingredient of the product is generated as sanding dust, and obtained typically from commercia sanding operations, wherein white maple and/or white oak are sanded with the grain to provide a fine dust or flour. White oak provides a flour with especially pleasing aroma, and flour generated by sanding with the grain provides a product which contributes to a steady slow consistent burn of the product and adds to the product's body. Hardwood "pulp" generated by milling, grinding or chopping is a less satisfactory a constituent. The hardwood flour can comprise approximately 18-70% of the product by weight.

The hard wood flour contributes to a clean burn, having little resin content, aids in keeping the ash from curling and controls the burn rate.

Other ingredients can be added to enhance the mechanical handling properties and burning or smoking characteristics of the product. These ingredients can include calcium carbonate, syrup, including any of the family of sucroses and fructoses, titanium dioxide, flavoring, western bentonite (i.e. sodium aluminum silicate) and natural fruit juices, such as prune juice.

Calcium carbonate contributes to a steady and consistent burn rate. Calcium carbonate is added at 2-10%, by weight of the ingredients.

Syrup contributes to an adhering of the ash to the unburnt product.

Bentonite contributes to ash adherence to the unburnt product, while titanium dioxide, which comprises about 0.5-15% by weight of the ingredients whitens the ash. Bentonite constitutes about 1-25% by weight of the product ingredients. A preferred kind of bentonite is western bentonite mineral colloid 101, available from the Georgia Kaolin Co., Inc., Elizabeth, New Jersey.

Flavoring, including fruit juices such as prune juice, contribute to the aroma, taste and coloring of the product. Of the syrups available, a mix of 50% corn syrup and 50% sucrose is prefered. It acts as a binder and a plasticizer of the coals, as well as, a flavor and aroma contributor. One hundred percent corn inverted sugar or alternatively, 100% fructose may be also used. However, as the choice of sweetener changes, the flavoring, aroma and plasticizing characteristics change. Inverted sugar, any of the fructoses or other syrups, including any of the sucroses, are added at about 16-30% by weight of the product ingredients.

Flavoring, comprising about 10-25% by weight of the ingredients, such as Felton 814 supplied by the Felton Flavor Co., Brooklyn, New York, may be added, or used as a substitute for the syrups above. Prune licquer may be added to comprise about 10-25% by weight of the ingredients. It adds flavor and aroma, as well as, acts as a humectant.

Coloring may be added as an ingredient to provide a golden brown color. This coloring can comprise up to 1%, by weight, of the ingredients of the product, but, typically, it is added in a range of about .25%-.74%. Coloring ingredients may include F, D, C, yellow No. 5; F, D, C, blue No. 1; and F, D, C red No. 40.

As seen in figure 1, the hard wood flour 11 (obtained from sanding) and the syrup or other plasticizer 13 are added together in a first blender 15.

The cellulosic base web 17, whether it be the more highly refined or the coarser one containing wood pulp, is mixed in a second blender 19 with the other ingredients 21. When a 'filler" product is intended, natural tobacco 23, if desired, is to be added into the product composition, such addition being in the neighborhood of 1-99% by weight. This tobacco 23 is added

into the second blender 19 with base web 17 and other ingredients 21. The mixture from the first blender 15 and the second blender 19 are placed into a third blender 25 where the entirety of the ingredients of the composition is mixed together.

The output from the blender 25 is sent to a casting box 27 and thereafter formed into a sheet 30 of the composition by being cast or extruded as a slurry layer onto a moving stainless steel conveyor belt 29. This material, in sheet form 30, is carried through drying ovens 31 and then on to a moisture control step 33 where either water mist or a prune juice mist is sprayed onto the surface of the dried product sheet 30 to regulate its moisture. At the end of the conveyor system 29 a knife 35 removes the sheet 30, whereinafter it is placed into a rotary dryer 37. The sheet 30 may be texturized by mechanical working, either in the rotary dryer 37 or as part of a texturizing and shredding operation 39 carried out by a shredder-texturizer 39.

The sheets 30 are cut into squares in the operation 39. The squares or wafers can be from 1 inch by 1 inches square to 2 inches by 2 inches square. Typically, the sheet 30 is 5.5 mils thick. The squares are shredded at 25-100 cuts per inch.

A bulk product 41 provided by the shredder and texturizing equipment 39 can then be made available to standard tobacco handling machinery 43 which is used to package cigarettes, cigars and package pipe tobacco.

Prune syrup and prune juice is a desirable organic moisturizer and plasticizer which can be added 33 to the surface of the sheet product following the drying oven 31 and prior to mechanical working by the rotary dryer 37 and the shredder 39. The prune syrup or prune juice can alternatively, and/or additionally be added to the product by being sprayed 44 on the surface following the rotary dryer 37 operation. Titanium dioxide

may also be mixed with the prune juice or prune syrup when it is sprayed 33 on the surface of the product.

The present invention departs considerably from other forms of material used as natural tobacco substitutes or tobacco supplements. It differs in that hardwood flour must be provided by sanding when the grain, i.e. cellular structure of the wood is not completely destroyed. If hard wood pulp which is provided by grinding, chopping or beating is used, the product acquires less desirable characteristics, as the sheet tends to curl and the burn characteristics degenerate. Hardwood flour, especially that provided from white maple or white oak, being very low in natural resin, and not bleached or refined by an acedic or caustic solution, provides a product which does not curl up when burning. It promotes a steady, slow burn similar to natural tobacco and provides an ash which clings similar to natural tobacco.

The final slurry which is pumped from the third blender 25 to the casting box 27 and then extruded/cast onto the continuous stainless steel belt 29 to form the sheet 30 is at ambient temperatures throughout. This sheet 30 is then passed through a series of drying ovens 31 at temperatures between 100°C and 300°C. The moisture content of the sheet 30 is then judged, and if it is too dry, it is sprayed with a fine water mist on its upper surface at the moisture control point 33. The moisture is then controlled on the sheet via the rotary dryer 37 to 5-12%.

The bulk product 41 produced has a weight, thickness and texture similar to that of natural tobacco and has a tensile strength in the range of which approaches that of natural tobacco. These physical characteristics allow the product to be further handled and packaged with standard tobacco handling equipment 43.

The product 41 can also have a surface coating of potassium chloride or calcium carbonate which is added to the prune syrup or prune juice 33 sprayed as a surface coating. Polypropylene glycol can be also added to the sheet. However, polypropylene glycol should not be present in a concentration of greater than 3% by weight.

Various combinations of the ingredients to form various recipes can provide satisfactory product 41. However, a hardwood recipe which provides excellent smoking product is as follows:

Base Web	20% by weight
Corn Syrup (50% hi-malt 50% sucrose)	30% by weight
Calcium carbonate	5% by weight
Hardwood flour (white maple/ white oak)	30% by weight
Titanium dioxide	5% by weight
Western Bentonite (colloid 101)	10% by weight

The hardwood recipe above, following the shredding and texturizing step 39 ma· be subjected to being sprayed by a finish coating 44. This finish coating 44 is sprayed to a single side of the product whether it is still in its uncut form (sheet 30) or in its shredded form (bulk product 41), this finish coating 44 contains prune concentrate syrup loaded with titanium dioxide and flavoring such as Felton flavor 814.

The prune syrup, alternately, may also be loaded with sodium bicarbonate or potassium chloride or calcium carbonate or any combination of these, and also with propylene glycol.

Variations of the recipe provide acceptable smoking characteristics for the product. These variations are shown in examples 1, 2, 3, 4 and 5, below where each of the constituents or ingredients is identified by per cent dry weight of the total composition. Each of the recipes of these tables provide a

non-tobacco smoking product 41 whose smoking characteristics, i.e. aroma, burn rate, and ash formation, and mechanical handling characteristics vary, but which all are in the range desirable for an acceptable non-tobacco smoking product.

EXAMPLE 1

(Run Sample:)	A	B	C	D	E	20% Tobacco[3]
Baseweb[1]	14.74	20.00	20.00	20.00	20.00	16.00
Syrup[2]	22.10	22.00	20.00	16.00	22.00	17.60
Calcium Carbonate	7.37	7.33	6.67	5.33	7.33	5.86
Hardwood Flour[4]	25.79	25.67	23.33	18.67	25.67	20.54
Titanium Dioxide	15.00	10.00	15.00	10.00	12.50	8.00
Bentonite	15.00	15.00	15.00	10.00	12.50	12.50

1. Baseweb consists of the standard industry fibers and gums.
2. Syrup will consist either of Corn Syrup or a 50% Corn Syrup/ 50% Sucrose mixture.
3. Tobacco may be added in any percentage. Figures here are only for a 20% tobacco mixture.
4. Sanded only. 100 mesh of white maple and white oak.

EXAMPLE 2

(Run Sample:)	F	G	H	I	J
Baseweb (H.R.)	20	20	20	20	20
36 DE Corn syrup	30	--	30	--	--
50% Hi-Malt Corn Syrup/50% Sucrose	--	30	--	30	30
Calcium Carbonate	10	10	10	10	5
Hardwood Flour	35	35	30	30	30
Titanium Dioxide	5	5	5	5	5
Western Bentonite (Colloid 101)	--	--	5	5	10

EXAMPLE 3

(Run Sample:)	K	L	M	N	O	P
Baseweb	20	20	20	20	20	--
Baseweb (Without Pulp	--	--	--	--	--	20
Total Invert Syrup (American Sweeteners)	30	30	30	30	30	30
Calcium Carbonate	10	10	10	10	10	10
Hardwood Flour	40	35	35	30	33.5	30
Bentonite (Hydrite Flat D)	--	5	--	5	5	5
Titanium Dioxide	--	--	5	5	1.5	5

EXAMPLE 4

(Run Sample:)	Q	R	S	T	U	V	W	X
Baseweb with H.R. Pulp	14.74	19.74	19.74	19.74	14.74	19.74	19.74	19.74
36 DE Corn Syrup	22.10	22.10	20.53	24.10	--	--	--	--
50% Hi-malt Corn Syrup/ 50% Sucrose	--	--	--	--	22.10	22.10	20.53	24.10
Calcium Carbonate	7.37	7.37	6.85	8.04	7.37	7.37	6.85	8.04
Hardwood Flour	25.79	25.79	23.95	28.12	25.79	25.79	23.95	28.12
Titanium Dioxide	15.00	10.00	13.93	10.00	15.00	10.00	13.93	10.00
Western Bentonite (Colloid 101)	15.00	15.00	15.00	10.00	15.00	15.00	15.00	10.00

EXAMPLE 5

(Run Sample:)	Y	Z	AA	BB	CC	DD
Baseweb	20	20	20	20	20	30
Felton Flavor 814	10	20	10	20	25	20
Hardwood Flour	70	60	65	55	55	45
Mineral Colloid 101 (Western Bentonite)	--	--	5	5	--	5

A preferred formulation is manufactured according to the process of figure 2. Water 45 as well as cellulose material 47 is fed into a first blender 49. To this is added a gum or other plasticizer 51 and other ingredients 53. The binder or "base web" material, which can eventually constitute about 20% of the product is mixed in this first blender 49.

The cellulose 47 is made from soft wood pulp. The gum 51 is guar gum, while the other ingredients 53 include methylhydroxply cellulose, ethylhydroxyelthyl cellulose and phosphoric acid.

As a percentage of the final product, these ingredients are mixed in the following percentages by dry weight:

Softwood Pulp	8.96%
Guar Gum	5.6 %
Methylhydroxply Cellulose	5 %
Ethylhydroxyelthyl Cellulose	0.16%
Phosphoric Acid	0.22%
	20 % (of total product)

The base web slurry which is output from the first blender 49 is input to a second blender 55 along with coffee 56, chicory 58, inert filler 60, calcium carbonate 62, titanium dioxide 64 and selective portions of flavoring and coloring 66. The percentages of each of these additional constituents as a function of the total product by dry weight is as follows:

Coffee	10%
Chicory	40%
Inert filler	12%
Calcium Carbonate	13%
Titanium Dioxide	5%
	80%

and minute amounts of flavoring and coloring.

These ingredients can be changed as far as percentage is concerned, or can be eliminated altogether. As an example, the coffee constituent 56 can be replaced with chicory, or the chicory constituent 58 can be replaced with coffee.

A preferred recipe is:

EXAMPLE 6

Base Web	20%
Chicory	65%
Calcium Carbonate	10%
Titanium Dioxide	5%
	100%

These ingredients can be further adjusted as follows:

EXAMPLE 7

Base Web	20%
Chicory	40-65%
Calcium Carbonate	5-20%
Titanium Dioxide	2-10%
Proplyene Glycol	1-10%
	100%

A further preferred recipe is:

EXAMPLE 8

Base Web	20%
Chicory	60%
Calcium Carbonate	10%
Titanium Dioxide	4%
Proplyene Glycol	6%
	100%

The inert filler 60 material can include any of the following materials either solely or in combination: clay, brick dust, crushed stone particles, diatomaceous earth, sand, and bentonite.

The flavoring and coloring 66 can include any of the following: FD&C Yellow No. 5, a chocolate brown blend (containing FD&C Yellow No. 5, FD&C Blue No. 1, FD&C Red No. 40), and Felton Corporation flavoring No. 814.

The blended product fed from the second blender 55, figure 2, is entered into a casting box 57 which provides a layer of slurry material 59 on a first conveyor 61. This conveyor 61 travels a drying ovens 63 which dry the slurry 59 into a sheet material 65. The conveyor 61 then carries the sheet material 65 past a moisture control station 67 which can temper the moisture content of the sheet 65 prior to a knife removal operation 69.

A rotary dryer 71 is employed to dry the sheet material 65 removed from conveyor 61 by the knife 69.

The output of the rotary dryer 71 is fed to a shredder and texturizing station in which any of a number of machines may chop up the sheet while texturizing it into small elongate particle bits similar in size and weight to shredded tobacco products. The output of the shredding and texturizing stations 73 is bulk product 75 which is then shipped to standard tobacco handling and packaging machinery 43 which packages the product into cigarette type or cigar type or pipe tobacco type smoking product.

The sheet 61 thickness is similar to sheet 30, figure 1, the dicing and shredding sizes are similar to the process of figure 1 and the operating temperatures are similar to those described in connection with figure 1.

As an addition to the process of either figures 1 or 2, shredded tobacco 77 may be dry mixed with bulk product 75 in a dry mixing operation 79 to produce a blended mix 81 of from 1-99% tobacco, or conversely, from 1-99% bulk product 75. This blended mix is then fed to the standard tobacco handling and packaging machinery 43.

While the moisture control station 67 shown in figure 2 is discussed above, this moisture control 67 may not be necessary depending upon the accuracy of the control of moisture capable with the drying ovens 63 and the rotary dryer 71. It is desirable that the product coming out of the rotary dryer 71 to contain about 6-7% water. This will promote pliability and reduce "dusting" when the material travels through the shredding and texturizing station 73.

The bulk product 75 is intended to have the same or similar physical properties such as size, texture, tensile strength, and weight as shredded natural tobacco 77.

The bulk products 41, 75 above, either that described in connection with figure 1, or that described in connection with figure 2, can have other constituents added to the blender

before it is cast into sheet. The addition of triethylene glycol in amounts from 1-5% by weight could supplant other ingredients, such as gum thereby reducing the amount of the guar gum to approximately 1-4%. It is to be noted that all percentages are by weight on a dry basis. The addition of propylene glycol will permit, typically, the amount of inert filler material 61 to be reduced.

The percentage of coffee 56 can be increased from the 10% level above, and going as high as 70%. Likewise, the percentage of chicory 58 can be varied from 10% to as much as 70%. With these variations in the percentage of inert filler 60, coffee 56, chicory 58 or the addition of propylene glycol, the approximate percentages of calcium carbonate 62 and titanium dioxide 64 are held approximately constant. Calcium carbonate 62 acts as a combustion control constituent while titanium dioxide 64 acts as an ash whitening agent. Other examples of the recipe for the bulk product 75 provided in figure 2 are as follows:

EXAMPLE 9

Base web material (blender 49 output)	20%
Propylene glycol	6%
Calcium carbonate	17%
Titanium dioxide	7%
Freeze dried coffee	10%
Chicory	40%
	100%

This formulation can provide a sheet with a weight of approximately 8 grams per square foot and a moisture content of about 9%.

Another example of the formulation is as follows:

EXAMPLE 10

Base web	20%
Propylene glycol	6%
Calcium carbonate	17%
Titanium dioxide	7%
Chicory	36-50%
Spray dried instant coffee	3-10%
Inert filler	10%
Felton Company flavor 770	0.5%
	100%

With moisture content high, the sheet material will become sticky. Regardless, the longitudinal dry strength of the product 75, Example 10, was in excess of 1000 grams per inch while the transverse dry strength of the product 75 provided by this Example 10 ranged from approximately 500 grams to 700 grams per inch.

The constituents of Examples 9 and 10 can also be varied to include soluble "chicory" 58 instead of ground "chicory" 58 and spray dried coffee 56 instead of freeze dried coffee 56. When spray dried coffee 56 is used, Example 10 becomes as follows:

EXAMPLE 11

Base web	20%
Propylene glycol	6%
Calcium carbonate	17%
Titanium dioxide	7%
"Soluble" chicory	29-50%
Spray dried instant coffee	10-20%
Felton Company flavor 770	0.5-2%
	100%

The bulk product 75, Example 11, produced with these constituents has a weight from 10-20% less than the bulk product 75 produced by Example 9, or Example 10 with approximately the same moisture content. Moreover, dry longitudinal strength of the product 75, Example 11, was in excess of 500 grams per inch, less than with the previous Examples 9 and 10; and transverse dry strength was from 300 to 500 grams per inch, less than with the previous Examples 9 and 10.

When lower levels of flavoring and inert material are added as constituents, the sheet weight is slightly less than with Examples 9 and 10, but the sheet strength remains approximately constant with those examples. This recipe can be as follows:

EXAMPLE 12

Base web	20%
Propylene glycol	6%
Calcium carbonate	17%
Titanium dioxide	7%
Chicory	29-40%
Spray dried instant coffee	10%
Felton Company flavor 770	0-.25%
Inert Filler	0-10%
	100%

With this Example 12, weight is approximately that of Examples 9 and 10 for the same approximate moisture content. Likewise, the dry strength exhibited by this Example 12 product 75 was in excess of 1000 grams per inch for longitudinal dry strength and in a range of 500-700 grams per inch for transverse dry strength.

The Examples 9 through 12 above can also be mixed with no flavoring and no propylene glycol or, as an alternative to Felton Company flavoring 770, Felton Flavoring 214 can be used.

Different forms of coffee 56 can be mixed in the second blender 55, figure 2. Dehydrated coffee and dry roasted ground coffee can be substituted for freeze-dried or spray dried coffee. Likewise, the chicory 58 can take other forms. Ground, ground and roasted, and dehydrated chicory can be substituted.

As the recipe for the constituents varies, the taste, aroma, coloring and weight and tensile strength of the bulk products 41 or 75 will vary. It is important that a certain tensile strength and "texturizing memory" be imparted to the product.

The dicing-shredder and surface crinkle (texturizing) apparatus 39, 73, figures 1, 2, respectively, and the process step performed thereby, can be replaced with ribbon shredding.

This variation for the apparatus 39, 73, first slices the sheet 30, 65 into longitudinal ribbons 1/32 inches wide and then cuts 1/2 inch long slices off of these ribbons. This

apparatus and process provides more uniform sizing of product which in turn facilitates the paper tube packing of the smokes. Without the texturizing, easier filling of the paper tubes is accomplished by the handling machinery 43.

The above description of the inventive product and process for manufacturing the product is to be read and considered as illustrative, and is not to be interpreted in the limiting sense. Variations in the recipes for the product and variations in the process may be made without departing from the intent or scope of the invention. For example, instead of adding tobacco or tobacco plant parts to the bulk product 75 in the dry mixing step 79, the tobacco or tobacco plant parts could be added either in the first blender 49, figure 2, or the second blender 55 to form a tobacco bearing sheet 61. Similarly, any type of sheet or paper making machine can be substituted for the structure described above, such other machine would understandably carry its own substituted manufacturing steps. This, too, is contemplated as part of the invention.

WHAT IS CLAIMED IS:

1. A method of making a non-tobacco smoking product comprising the steps of:

first mixing a hardwood flour with syrup to form a first slurry;

second mixing a cellulosic material with burn, ash, aroma and flavor contributing ingredients to form a second slurry;

third mixing said first slurry with said second slurry to form a third slurry;

pumping said third slurry into a casting head box;

extrude/casting said third slurry onto a conveyor to form a sheet;

passing the sheet through a series of drying ovens at temperatures between 100° and 300°C;

adjusting the moisture content of the sheet; and

shredding the sheet into pieces to form a product.

2. The method of claim 1 wherein the step of adjusting the moisture content includes after the oven passing step, the steps of:

spraying a fine mist on the upper surface of said sheet exiting from said drying ovens;

removing said sheet from said conveyor with a scraping knife; and

drying said removed sheet to a 5-12% moisture in a rotary dryer.

3. The method of claim 2 wherein said fine mist spray is water.

4. The method of claim 2 wherein said fine mist spray includes prune syrup.

5. The method of claim 3 also including after the step of shredding the sheet the step of spraying said product with prune juice.

6. The method of claim 5 wherein said prune juice spray contains potassium chloride.

7. The method of claim 5 wherein said prune juice spray contains calcium carbonate.

8. The method of claim 5 wherein said prune juice spray contains sodium bicarbonate.

9. The method of claim 1 wherein said second mixing step ingredients include bentonite.

10. The method of claim 1 wherein said second mixing step ingredients include titanium dioxide.

11. The method of claim 1 wherein said first mixing step hardwood flour has been made by sanding hardwood.

12. The method of claim 11 wherein said hardwood sanding flour is made from white oak wood.

13. The method of claim 12 wherein said hardwood sanding flour is made from white maple wood.

14. A smoking product comprising the following ingredients:

hardwood flour;

at least one of the group of a syrup and a flavoring; and

a cellulosic material.

15. The product of claim 14 wherein the ingredients by weight may range as follows:

said hardwood flour between about 18% and 70%;

said syrup between about 16% and 30%;

said flavoring between about 10% and 25%; and

said cellulosic material between about 14.7% and 30%.

16. The product of claim 14 also including natural tobacco.

17. The product of claim 16 wherein said natural tobacco comprises 1-99% of the product by weight.

18. The product of claim 14 including the following additional ingredients:

at least one of a group of bentonite and titanium dioxide.

19. The product of claim 18 wherein the ingredients by weight may range as follows:

said bentonite between about 5 and 15%;

said titanium dioxide between about 1.5% and 15%;

said hardwood flour between about 18% and 70%;

said syrup between about 16% and 30%;

said flavoring between about 10% and 25%; and

said cellulosic material between about 14.7% and 30%.

20. The product of claim 19 also including calcium carbonate as an ingredient.

21. The product of claim 20 wherein said calcium carbonate ingredient by weight may range between 5% and 10%.

22. The product of claim 21 wherein said syrup is at least one from the group of: 36 DE corn syrup; hi-malt corn syrup; and sucrose.

23. The product of claim 22 also including the additional ingredient prune juice.

24. The product of claim 23 wherein said prune juice is applied to the surface of said product.

25. The product of claim 24 also including an additional surface coating of said product of at least one ingredient from the group of: sodium bicarbonate, potassium chloride, calcium carbonate, syrup.

26. The product of claim 19 also including propleyene glycol as an ingredient between about 1% and 15% by weight.

27. A smoking product comprising the following ingredients:

a cellulosic material - 20% by weight;

50% Hi-Malt Corn Syrup/50% sucrose - 30% by weight;

calcium carbonate - 5% by weight;

hardwood flour generated by sanding - 30% by weight;

titanium dioxide - 5% by weight; and

Western bentonite (colloid 101) - 10% by weight.

28. The product of claim 28 also including a surface coating of prune juice.

29. A method of making a non-tobacco smoking product comprising the steps of:

first mixing a first base web slurry;

second mixing a product slurry by adding to said base web slurry coffee to form a second slurry; and

forming a sheet from said second slurry.

30. The method of claim 29 further including after the step of forming a sheet the step of:

providing small pieces from said sheet.

31. The method of claim 30 wherein the step of forming said sheet includes:

casting a layer of said second slurry on a support medium; and

drying said layer into a sheet of product.

32. The method of claim 31 wherein chicory is substituted for said coffee.

33. The methods of claims 31 and 32 wherein said first mixing includes the step of mixing in a first blender a cellulose, guar gum, methylhydroxply cellulose ethyhydroxyethyl cellulose and phosphoric acid.

34. The method of claim 33 wherein said second mixing includes adding both chicory and coffee to said first slurry in a second blender, and adding an inert filler, calcium carbonate and titanium dioxide into said second blender.

35. The method of claim 34 wherein said second mixing also includes additionally adding calcium carbonate and flavor and color agents into said second blender.

36. The method of claim 35 wherein the step of casting a layer of said second slurry includes the steps of:

passing said second slurry from said second blender to a casting box;

depositing a layer of slurry on a moving conveyor belt from said casting box;

passing said conveyor belt through a drying oven to dry said deposited slurry layer into a sheet; and

removing said sheet from said conveyor belt following said drying oven.

37. The method of claim 36 also including following the step of removing said sheet from said conveyor belt, the steps of:

passing said removed sheet through a rotary dryer; and

shredding and texturizing said rotary dryer dried sheet to yield said product.

38. The method of claim 37 also including following the step of shredding and texturizing the steps of adding shredded natural tobacco to said product; and

dry mixing to provide a blended mix.

39. The method of claim 37 wherein the step of shredding includes dicing said sheet into squares and then shredding each said square into elongate rectangles; and wherein the step of texturizing includes crimping said sheet prior to said dicing.

40. The method of claim 38 also including the step of moisturizing said sheet following said drying oven step.

41. The method of claim 39 wherein the step of dicing includes dicing said sheet into squares ranging in size from about 1x1 inches to 2x2 inches and wherein the step of shredding includes shredding said squares at about 25-100 cuts per inch.

42. The method of claim 37 wherein the step of shredding and texturizing includes:

slicing said sheet into about 1/32 inches wide ribbons; and

chopping said ribbons into rectangular pieces about 1/2 inches long.

43. A smoking product comprising the following ingredients: a cellulosic base web; chicory; calcium carbonate and titanium dioxide.

44. The product of claim 43 including the additional ingredients: coffee and inert filler.

45. The product of claim 44 wherein said inert filler is chosen from the group: clay, brick dust, crushed stone particles, diatomaceous earth, sand, and bentonite.

46. The product of claim 44 wherein said ingredient proportions by weight are approximately:

cellulosic base web	20%
coffee	10%
chicory	40%
inert filler	12%
calcium carbonate	13%
titanium dioxide	5%

47. The product of claim 43 wherein said cellulosic base web contains the following ingredients by approximate weight of said product: softwood pulp 8.96%; guar gum 5.6%; methylhydroxply cellulose 5%; ethythydroxyelthyl cellulose 0.16%; and phosporic acid 0.22%.

48. The product of claim 43 wherein said ingredient proportions by weight are approximately:

cellulosic base web	20%
calcium carbonate	10%
titanium dioxide	5%

49. The product of claim 43 including the additional ingredient proplyene glycol.

50. The product of claim 49 wherein said ingredient proportions by dry weight are approximately:

cellulosic base web	20%
chicory	40-65%
calcium carbonate	5-20%
titanium dioxide	2-10%
propylene glycol	1-10%

51. The product of claim 50 wherein said ingredient proportions by dry weight are approximately:

cellulosic base web	20%
chicory	60%
calcium carbonate	10%
titanium dioxide	4%
propylene glycol	6%

52. The product of claim 43 including the additional ingredient coffee.

53. The product of claim 52 also including the additional ingredient propylene glycol and wherein said ingredient proportions by weight are approximately:

cellulosic base web	20%
propylene glycol	6%
calcium carbonate	17%
titanium dioxide	7%
chicory	29-50%
coffee	3-20%

54. The product of claim 53 wherein said coffee proportion is 10% by weight and said chicory proportion is 40% by weight.

55. The product of claim 54 wherein said chicory proportion is 36-50% by weight and said coffee proportion is 3-10% by weight; and also including inert filler at 10% by weight and Felton Flavor 770 at 0.5% by weight.

56. The product of claim 55 wherein said chicory proportion is 29-50% and said coffee proportion is 10-20% by weight; and also including Felton Flavor 770 at 0.5-2% by weight.

57. The product of claim 56 wherein said chicory is 29-40% and said coffee is 10%; and also including Felton Flavor 770 at 0-0.25% by weight; and inert filler at 0-10% by weight.

58. The product of claim 54 wherein said coffee is freeze dried coffee.

59. The product of claim 55 wherein said coffee is spray dried instant coffee.

60. The product of claim 56 wherein said chicory is soluble chicory and said coffee is spray dried instant coffee.

61. The product of claim 57 wherein said coffee is spray dried instant coffee.

62. A smoking product comprising the following ingredients: a cellulosic base web; coffee; calcium carbonate and titanium dioxide.

63. The product of claim 43 wherein said chicory ingredient is chosen from the group: soluble chicory, ground chicory, ground and roasted chicory, and dehydrated chicory.

64. The product of claims 49 or 62 wherein said coffee ingredient is chosen from the group: freeze dried coffee, spray dried coffee, dehydrated coffee, and dry roasted ground coffee.

65. A smoking product comprising the following ingredients:

cellulosic base web	1-20%
chicory	14-78%
tobacco leaf and tobacco plant parts	2-85%

66. The smoking product of claim 65 also including the additional ingredients: calcium carbonate, titanium dioxide and propylene glycol.

67. The smoking product of claim 66 wherein said ingredient proportions by dry weight are approximately:

cellulosic base web	20%
chicory	40%
tobacco leaf and tobacco plant parts	25%
calcium carbonate	8%
titanium dioxide	4%
propylene glycol	3%

68. The smoking product of claim 67 wherein said tobacco leaf ingredient is 25% of the product.

69. The smoking product of claim 67 wherein said tobacco leaf ingredient is 15-23% and said tobacco plant parts ingredient is 2-10% of the product.

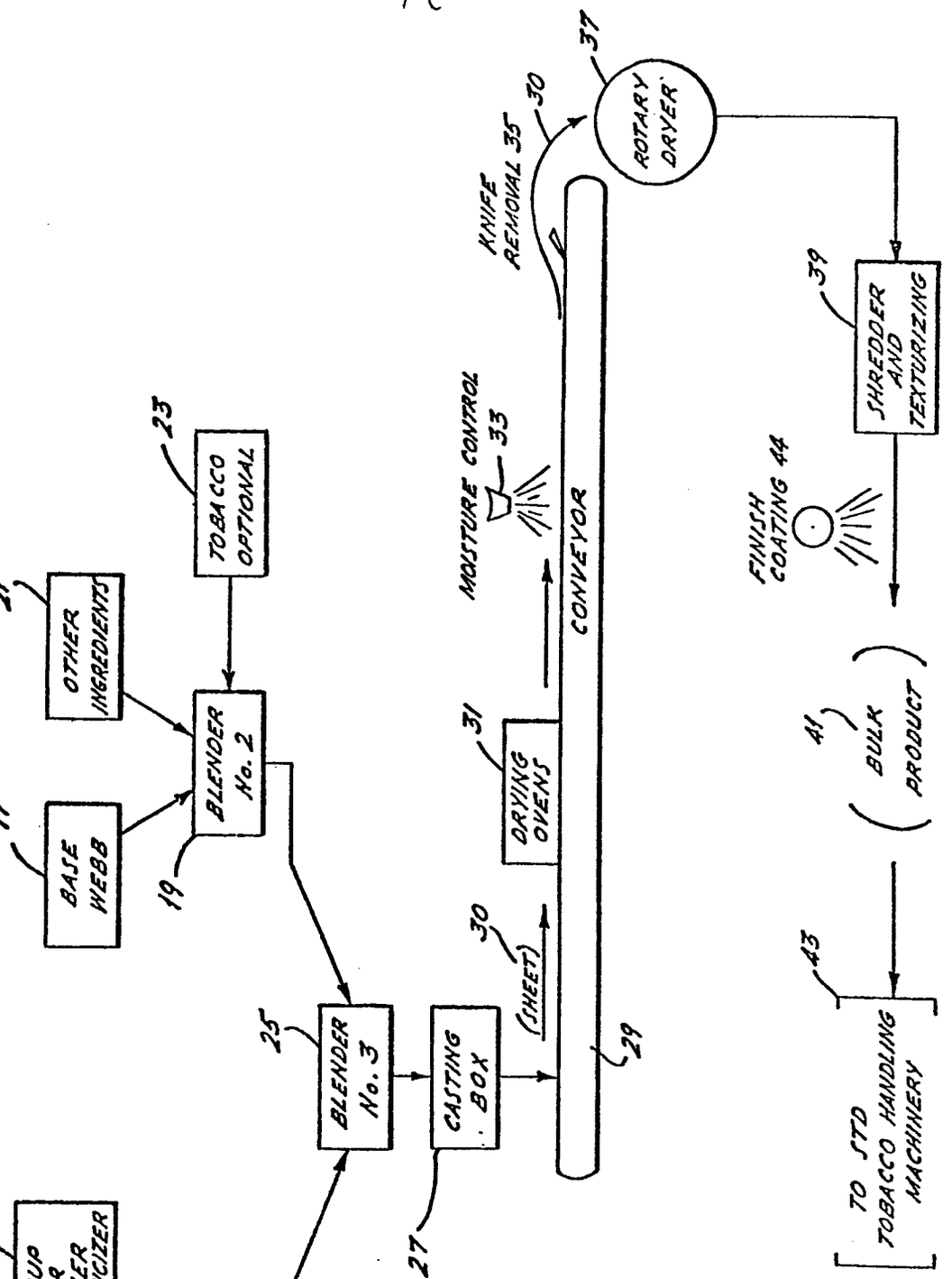

HARDWOOD FLOOR FROM SANDING
11
SYRUP OR OTHER PLASTICIZER
13
BLENDER No. 1
15
BASE WEBB
17
19
OTHER INGREDIENTS
21
TOBACCO OPTIONAL
23
BLENDER No. 2
BLENDER No. 3
25
CASTING BOX
27
(SHEET)
30
29
DRYING OVENS
31
MOISTURE CONTROL
33
CONVEYOR
KNIFE REMOVAL 35
30
ROTARY DRYER
37
SHREDDER AND TEXTURIZING
39
FINISH COATING 44
BULK PRODUCT
41
43
TO STD TOBACCO HANDLING MACHINERY

FIG. 1.

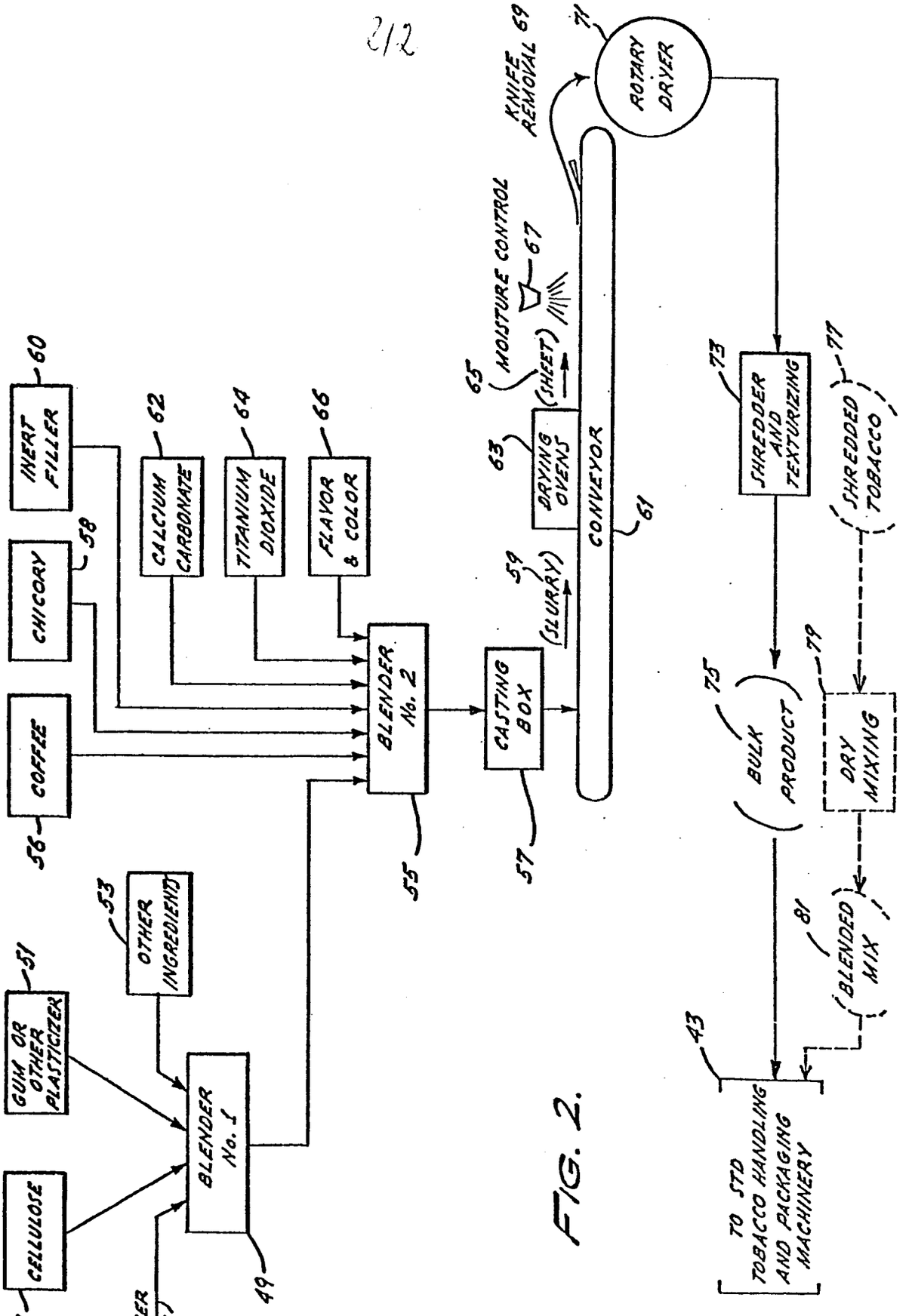

CELLULOSE
47
GUM OR OTHER PLASTICIZER
51
WATER
45
BLENDER No. 1
49
OTHER INGREDIENT
53
COFFEE
56
CHICORY
58
INERT FILLER
60
CALCIUM CARBONATE
62
TITANIUM DIOXIDE
64
FLAVOR & COLOR
66
BLENDER No. 2
55
CASTING BOX
57
(SLURRY)
59
CONVEYOR
61
DRYING OVENS
63
(SHEET)
65
MOISTURE CONTROL
67
KNIFE REMOVAL 69
ROTARY DRYER
71
SHREDDER AND TEXTURIZING
73
SHREDDED TOBACCO
77
BULK PRODUCT
75
DRY MIXING
79
BLENDED MIX
81
43
TO STD TOBACCO HANDLING AND PACKAGING MACHINERY

FIG. 2.