METHOD OF PRODUCING SHAPED TOBACCO PRODUCTS AND SHAPED PRODUCTS PRODUCED THEREBY

8 Claims, No Drawings

ABSTRACT: A method is provided for producing shaped tobacco products. Comminuted tobacco material, having an average grain size of up to about 100μ, is mixed with an aqueous solution having a pH of about 6 to about 10 and containing, in an amount up to about 15 percent by weight of the tobacco material, a substance selected from the group consisting of inorganic base, organic base, alkali metal and ammonium salts and mixtures thereof to form an aqueous slurry. The slurry is subjected to a temperature of not greater than about 100°C. for a period of up to about 45 minutes to form a pulp. To the resulting pulp is added from about 0.5 to about 3 percent by weight based on the weight of the tobacco of a binding agent. Products are shaped from the resulting pulp and the shaped products are dried at a temperature of from about 60° to about 100°C.
METHOD OF PRODUCING SHAPED TOBACCO PRODUCTS AND SHAPED PRODUCTS PRODUCED THEREBY

This application is a continuation-in-part of application Ser. No. 393,410, filed Aug. 31, 1964 now abandoned. This relates to a novel method for producing shaped tobacco products and to the shaped products produced thereby. In particular the instant method relates to the production of reconstituted tobacco sheet material having substantial advantages over the previously known methods and products. In accordance with the present invention a product is provided which maintains the tobacco flavor and at the same time attains the physical properties desired in a reconstituted tobacco product.

As is known to the art, the cellular units of tobacco plant leaves are held together by a substance contained in the middle lamella. The substances of such middle lamellae consist, in addition to hemicellulose, pentosans and lignins, of high-polymeric polylacturonic acid, more or less esterified with methanol, said acid comprising a large number of galacturonic acid units (varying according to the treatment of the tobacco). These are linked with a 1,4-glucosidic bond. Long molecules similar to the kind present in cellulose are formed by this linking. The partially esterified polylacturonic acid is calledpectin.

Pectin is contained in tobacco in an amount of up to 20 percent. Pectin has the task in the tobacco of holding together the cellular unit. The fixing of the adhesive mechanism, primarily to guarantee water insolubility, occurs in plants by entrance of calcium and/or magnesium in the carboxylic group liberated by saponification of the ester. It is supposed that the free carboxylic group in two adjacent pectin molecules is occupied by magnesium or calcium. The calcium and magnesium salts are water insoluble. The high-polymeric, saponifiable and/or hydrolyzable products present in tobacco can be degraded to water soluble or swellable and adhesive substances, respectively.

Based upon this knowledge, a novel method for the production of shaped tobacco products has now been developed.

In the previously employed methods for producing shaped tobacco products, and more particularly tobacco sheets, one was forced to employ binding agents in relatively large amounts, preferably in amounts of more than 10 percent, whereby individual tobacco particles were held together to form a sheet. However, the flavor of the resultant product was negatively influenced. Moreover, the binding agents gave rise to additional costs.

Recently, methods have been developed whereby tobacco sheets can be produced either by treating finely ground tobacco or other solvents at temperatures of below about 100°C., or by a relatively shorter treatment but with the use of super atmospheric pressure and temperatures exceeding 100°C.

There is a disadvantage in these known processes in that the sheets formed thereby have a partially undesired dark color. Moreover, valuable tobacco ingredients are thereby decomposed by these known processes because of the necessary intensive aqueous treatment which either lasts for several hours or is conducted at high temperatures. In this way the quality of the resultant tobacco product suffers.

The present invention provides a method for the production of shaped tobacco products not suffering from the indicated disadvantages.

The objects of the present invention are met by

1. preparing an aqueous slurry comprising
   a. an aqueous solution having a pH prior to admixture with tobacco of about 6 to about 10 and containing, in an amount up to about 15 percent by weight of the tobacco material, a substance selected from the group consisting of inorganic bases, organic bases and alka-lime metal and ammonium salts of organic and inorganic acids.
   b. comminuted tobacco material having an average grain size of up to about 100μ to form an aqueous slurry,
   c. adding to the resulting pulp from about 0.5 to about 3 percent by weight based on the weight of the tobacco of a binding agent,
   d. forming a shaped product from the resultant pulp by applying said pulp to a substrate,
   e. drying the resultant shaped product at a temperature of from about 60 to about 100°C., and
   f. removing the dried product from the substrate.

In accordance with the method of the present invention, comminuted tobacco material having an average grain size of up to about 100μ which has not been subjected to a preliminary washing, soaking or leaching treatment, is mixed with an aqueous solution having a pH of about 6 to about 10 and containing, in an amount up to about 15 percent by weight of the tobacco material, a substance from the group of inorganic bases, organic bases, alka-lime metal salt and ammonium salts and mixtures thereof. The thus formed aqueous slurry is subjected to a temperature of not greater than 100°C., for a period of from about 45 minutes to form a pulp. To the resulting pulp is added from about 0.5 to about 3 percent by weight based upon the weight of the tobacco of a binding agent. The resultant pulp is then formed into a shaped product and the resultant shaped product is dried at a temperature of about 60°C. to about 100°C.

In accordance with the present invention the tobacco-starting material can be partially fermented (cured), partially fermented and unfermented tobacco or tobacco waste or shreds such as arise in the tobacco industry. This is inclusive of veins, stalks, tobacco dust and stems and the like. It is not necessary in this invention to conduct a preliminary washing step and thus the starting material may contain impurities such as sand and the like. The starting material can be that obtained from light tobacco or light tobacco waste or shreds as well as from dark tobaccos or dark tobacco waste or shreds.

It should also be pointed out that tobaccos having differing pH values as well as mixtures thereof can be employed as starting materials. For example soy-called light, preferably uncured, oven-dried or sun-dried (redried) tobaccos which have a pH value of less than 6 in the main current smoke, such as Virginia, Orient, Smyrna or waste thereof, for example, veins or stalks, may be incorporated into comminuted cigar tobaccos and/or waste thereof having a pH value of more than 6 in the main current smoke for processing.

Materials that form poisonous or detrimental (noxious) substances, such as hydrogen sulfide, hydrocyanic acid, nitroamines or carbon monoxide in detrimental quantities in the main smoke stream of the finished tobacco product are excluded as solvents and as additives. (Main smoke stream is the inhaled portion of the smoke).

One of the essential benefits of the present invention is the tobacco product obtained according to the method, even when produced only from tobacco waste materials, corresponds substantially to the color of the tobacco material used as starting material.

Additionally, the products obtained differ in aroma only insignificantly, if at all, from the tobacco-starting material initially employed.

The tobacco material used as starting material in the present invention is comminuted prior to utilization. Preferably, the tobacco-starting material is ground as finely as possible. This grinding is effected with the aid of any desired grinding device. Tests have shown that good results are obtained if the tobacco material is reduced to an average grain size of about 50 to 500μ. It will be appreciated that good results can be obtained if the tobacco material is reduced to an average grain size of even below about 100μ. It is preferred that the average grain size of the tobacco-starting material be up to about 50μ.

The comminuted tobacco-starting material is mixed with an aqueous solution having a pH of about 6 to about 10 to form an aqueous slurry. The aqueous slurry is subjected to a tem-
perature of not greater than 100° C., for a period of up to about 45 minutes to form a pulp. In accordance with such treatment, the high聚meric, saponifiable and/or hydrolyzable substances present in the comminuted tobacco-starting material are made swellable or adhesive. It is important that the slurry be subjected to a temperature which is not greater than 100° C., in view of the fact that substantially higher temperatures will adversely affect the product obtained.

The pulp which is utilized to form the slurry has a pH of from about 6 to about 10 and preferably from about 7.5 to about 9.0. The pH of the aqueous solution is adjusted prior to the addition of the comminuted tobacco-starting material to form the slurry. No adjustment in the pH is made after the addition of the comminuted tobacco material. The aqueous solution consists of at least one chemical substance which is either present per se in the tobacco-starting material or has a composition such that its aqueous solution yields, at least partially, the same ions as those ions which are present in the original tobacco-starting material. Among suitable substances contained in the aqueous solution are alkali metal and ammonium salts and mixtures thereof of organic or inorganic acids, free organic bases and free inorganic bases. As inorganic bases there may be mentioned potassium hydroxide, sodium hydroxide, ammonia and the like. Ethylenediamine may be mentioned as an example of an organic base. As alkali metal salts or ammonium salts, there may be mentioned those of organic acids, as for example, formic acid, acetic acid, carbonic acid, malic acid, citric acid and tartaric acid. Salts of phosphoric acids are also utilisable. Mixtures of these basic salt materials can be utilized to achieve the desired pH of the aqueous solution.

The concentration of the aqueous solution, or the amount of the basic or salt materials used in the aqueous solution for the regeneration of the high-polymeric materials, depends on the one hand, upon the quality and upon the composition of the tobacco-starting material to be treated, and, on the other hand, upon the desired properties of the shaped tobacco product. In general good results are obtained with a concentration of the material of up to about 15 percent by weight of the dry substance based upon the weight of the tobacco-starting material to be treated. In particular the concentration will generally range from about 0.1 to about 15 percent by weight of the tobacco starting material although 0.1 to 5 percent is preferable.

By heating of the slurry to a temperature of not greater than 100° C., for a period up to about 45 minutes, a pulp is formed. This pulp is then utilized to form shaped products, which product is dried at a temperature of from about 60° to about 100° C., to obtain the final tobacco products of the invention.

The resultant pulp can be utilized in the formation of the shaped product as it is, or, preferably, further materials are added prior to the shaping and drying.

In particular there can be added to the pulp from about 0.5 up to about 3 percent by weight based on the weight of the tobacco-starting material of a binding agent. This binding agent may be an adhesive or adhesive mixture such as, for example, raw pulp, ethyl, acetyl, methyl, carboxymethyl, hydroxyethyl celluloses, pectins, carob bean kernel meal, agar-agar, manucol (sodium alginate), guar gum, or other mucouslike adhesive substances. In general this binder material is utilized in an amount up to about 3 percent by weight based on the weight of the tobacco-starting material. It has proven advantageous to operate in the presence of at most about 2 percent by weight of a binding agent or of a binding agent mixture when using light tobacco as the starting material, or in the presence of up to about 3 percent by weight of a binding agent or of a binding agent mixture when using dark tobacco as the starting material. In particular the amount of the adhesive or adhesive mixture employed will range from about 0.5 up to about 3 percent by weight based on the weight of the tobacco. Higher amounts will adversely affect the tobacco aroma.

There can also be added to the pulp a fibrous material as, for example, mineral fibers, asbestos fibers, in order to increase the tensile strength of the shaped product. Such materials must be chosen so as not to interfere with the flavor and color of the resultant product. In general any fibrous material which resists burning under conditions whereby the tobacco is smoked will be suitable. The fibrous material can be employed in amounts of up to about 2 percent by weight based on the weight of the tobacco-starting material.

Additional materials can, if desired, be added to the resultant pulp prior to shaping. In particular, one can add, if desired, catalytically active substances such as titanium compounds, manganese compounds, and the like, for example, titanium dioxide, manganese sulfate, manganese citrate or tartrate and/or plasticizers such as for example glycerol, sorbit, diethylene glycol and the like. By adding such materials, one can attain in many cases a simultaneous improvement of the quality of the tobacco material, as for example, better burning, milder smoke flavor or decreased methanol content of the main current smoke. A significantly improved water insolubility of the sheets can also be obtained by the further addition to the pulp of preferably calcium or magnesium salts, e.g., calcium formate, calcium lactate, calcium gluconate, magnesium acetate, magnesium citrate, magnesium gluconate, magnesium formate, and the like or mixtures of the indicated materials.

Following the addition to the pulp of the additives as desired, the resultant pulp is shaped into the desired form and dried at a temperature of from about 60° to about 100° C. Preferably the pulp is passed in a desired thickness onto a, bell-like support and dried substantially on this support whereon a dried sheet material is obtained and removed from the support in a per se conventional manner. Before the removal of the sheet it is desirable to treat the sheet by, for example, spraying onto such sheet an aqueous solution of a plasticizer as, for example, glycerol, sorbit, or diethylene glycol. The plasticizer causes the sheet to maintain a certain plasticity. Amounts of from about 2 to about 5 percent by weight based upon the weight of tobacco of the plasticizer can be employed. The belt moves through a drying zone wherein the shaped material is dried and the sheet material is then removed from the belt by per se conventional means, as for example, by the use of a doctor blade.

The drying of the shaped material may be in a conventional manner such as IR-irradiation, warm or hot air, or by direct heating of the belt.

The shaped tobacco products produced according to the present invention, as for example, sheets, can be used as cover sheets for cigars, cigarillos and the like. They can also be used for the production of tobacco for cigarettes by reducing such sheets in a conventional manner to very small pieces, thus allowing the ultimate use of all waste tobacco materials resulting in the tobacco industry.

The following examples are illustrative.

**Example 1**

1.0 kg. of finely ground cigarette tobacco or waste material from cigarette production including veins, e.g., a tobacco material which consists primarily of oriental or Virginia tobacco, is slurried in 6 liters of an aqueous potassium hydroxide solution (0.01-0.1 percent concentration) and heated for 30 minutes at 80° to 90° C. After cooling, 0.5 percent by weight of a calcium salt, based on the tobacco weight, e.g., calcium gluconate, is added. The aqueous, and as far as possible, homogeneous, pulp is then applied in the desired thickness of about 0.5 mm. onto an endless steel belt in accordance with a conventional method. This belt is passed through a heating channel at 60° to 100° C. The resulting sheet thereby having its moistness removed while maintaining a certain plasticity. Before removal, 2 to 5 percent by weight (based on the tobacco weight) of an aqueous solution of plasticizer, e.g., glycerol, sorbit, diethylene glycol, is sprayed onto the sheet. The resulting dried product can be removed in conventional manner from the steel belt by means of a scraping device of known
construction, and the resulting tobacco sheet cut to the desired width and/or wound as a roll of any desired length and width.

Proceeding in the above-indicated manner, 1.0 kg. of finely comminuted Virginia tobacco resulting as waste from cigarette production and having an average grain size of about 50μ is slurred in 6 liters of a 0.01 percent aqueous potassium hydroxide solution. The slurry is heated for 30 minutes at a temperature of 90°C, to obtain a pulp. The pulp is cooled and 0.5 percent by weight based on the weight of the tobacco of calcium glucosate is added. The pulp is applied in a thickness of about 0.5 mm. onto an endless steel belt in accordance with conventional methods. This belt is passed through a heating channel at a temperature of about 90°C. Prior to removal of the sheet 5 percent by weight based upon the weight of the tobacco of glyc erine is applied to the sheet by spraying an aqueous solution of glyc erine onto the sheet.

The resulting dried product is removed from the steel belt in conventional manner and is taken up as a roll.

**EXAMPLE 2**

1.0 kg. of finely ground light cigarette tobacco waste material is slurred in 6 liters of an aqueous ammonia solution having a pH of 7.5 to 10. The suspension is heated under reflux for 15 to 40 minutes at 100°C and stirred. The further processing, in particular addition of a magnesium compound, e.g., magnesium formate, and of a plasticizer, e.g., diethylene glycol, is effected as in example 1.

In the manner indicated above, 1.0 kg. of finely comminuted Virginia tobacco resulting from waste as cigarette production and having an average grain size of about 50μ is slurred in 6 liters of aqueous ammonia solution having a pH of about 10. This suspension is heated under reflux for a period of about 35 minutes at a temperature of 100°C with stirring. In the same manner as in example 1, 0.5 percent magnesium formate is added to the pulp. The formation and drying of the sheet material is in the manner of example 1 with 5 percent by weight of diethylene glycol being applied to the sheet prior to removal.

**EXAMPLE 3**

1.0 kg. of finely ground dark waste material of cigar or cigarette tobacco is slurred in 4 liters of an aqueous ammonia or potassium hydroxide solution having a pH of 7.5 to 10. The working is carried out as above and after terminating the saponification or hydrolysis, respectively, 2 percent by weight of foreign pectin (based on the tobacco weight) is added in the form of an aqueous solution, as well as 1 percent of asbestos fibers (based on the tobacco weight). After homogenizing well, the pulp is applied onto the endless V4A belt and dried and removed in conventional manner.

In the manner indicated above 1.0 kg. of finely ground dark waste material from cigarette tobacco having an average grain size of about 50μ is slurred in 4 liters of an aqueous solution of potassium hydroxide having a pH of about 10. The slurry is heated for about 35 minutes at a temperature of 100°C with stirring. Upon cooling 2 percent by weight, based upon the weight of tobacco, of pectin is added in the form of an aqueous solution. In addition, 1 percent by weight, based upon the weight of tobacco, of asbestos fibers are added. The mixture is homogenized to form a pulp. The pulp is applied onto an endless belt to form a sheet in the manner set forth in example 1. After initial drying the sheet is sprayed with an aqueous solution of tartaric acid and again dried. The sheet is removed from the endless belt in a conventional manner.

**EXAMPLE 4**

1.0 kg. of finely ground cigar, cigarette tobacco or waste material thereof having an average grain size of about 100μ is slurred in about 5 liters of an ammonium phosphate solution (0.1-0.4 percent concentration) or in 5 liters of water containing techn. ammonia and techn. phosphoric acid, in stoichiometric proportion in such an amount as to obtain an ammonium phosphate solution of 0.1-0.4 percent concentration. The resulting suspension is heated for 15 to 40 minutes at 80° to 90°C. After cooling, there is added 3-5 percent by weight of plasticizer (based on the dry weight of the tobacco material), such as glycerol, sorbit, diethylene glycol, etc., as well as, if desired to improve the burn of the cigar sheets, 0.1 to 0.5 percent by weight of potassium and/or magnesium formate (based on the weight of the tobacco material) and the resulting viscous mass, after thorough homogenization is applied in desired thickness onto an endless steel belt. The sheet is dried and removed as in example 1.

In the above-indicated manner, 1.0 kg. of cigar tobacco waste material having an average grain size of about 50μ is slurred in 5 liters of an ammonium phosphate solution having a concentration of 0.4 percent. The resulting slurry is heated for 35 minutes at a temperature of 80°C. After cooling there is added 5 percent by weight, based on the weight of the tobacco material, of diethylene glycol and 0.5 percent by weight, based on the weight of the tobacco material, of potassium formate. The resulting pulp is thoroughly homogenized. The resulting homogenized pulp is utilized to form a sheet material in the manner of example 1.

**EXAMPLE 5**

1.0 kg. of finely ground cigar, cigarette or pipe tobacco or waste material thereof is slurred in about 6 liters of an ammonium phosphate solution of 0.2-0.6 percent concentration or in 6 liters of water containing techn. ammonia and techn. phosphoric acid in stoichiometric proportion and in corresponding amounts and heated for 30 minutes at 70°-90°C while stirring. Thereupon, 1.0 kg. of finely ground tobacco preferably of the same quality as the tobacco material previously used and 3 percent by weight of sorbit, based on the dry weight of the tobacco material, are introduced into the resulting mixture, whereupon 2 kg. of a carboxymethyl cellulose solution having a 2 percent concentration are added.

The resulting pulp is worked up into a sheet according to the data in example 1.

In the above-indicated manner 1.0 kg., pipe tobacco is slurred in 6 liters ammonium phosphate solution of 0.6 percent concentration and is heated for 30 minutes at 70°C while stirring. Thereupon, 1.0 kg. of finely ground tobacco preferably used of the same quality as the tobacco material previously used and 3 percent by weight of sorbit, based on the dry weight of the tobacco material, are introduced into the resulting mixture, whereupon 2 kg. of a carboxymethyl cellulose solution having a 2 percent concentration are added.

**EXAMPLE 6**

A sheet is produced with 1.0 kg. of tobacco according to the data in any one of examples 4 or 5, an aqueous calcium gluconate solution being sprayed onto the sheet before removing it from the steel belt. The above procedure is repeated with magnesium citrate.

**EXAMPLE 7**

1.0 kg. finely ground tobacco is slurred in 4 kg. of an ammonium formate solution having a 2.5-4 percent by weight concentration or in 4 kg. of water containing stoichiometric amounts of techn. formic acid and techn. ammonia in such amounts as to obtain a solution having a 2.5-4 percent by weight concentration.

The mixture is heated for 15 to 45 minutes at 70°-90°C while stirring. After a short time a pulp, viscous mass forms which, after addition of 3-7 percent by weight of a plasticizer (based on the tobacco weight), such as glycerol, diethylene glycol, sorbit, etc., and small amounts (1-3 percent by weight based on the tobacco weight) of a binding agent, such as manucol, is applied in a desired thickness onto a V4A steel belt. The pH of the suspension is between 5.0 and 6.7 for cigarette tobacco, according to the quality thereof.
Proceeding in the above manner, 1 kg. of finely ground tobacco is slurried in 4 kg. of an ammonium formate solution (4 percent by weight). The mixture is heated for 20 minutes at 80°C while stirring. After a short time, a pulp viscous mass forms which after addition of 4 percent by weight of glycercine and 2 percent by weight of sodium alginate is applied. The pulp is applied in a V4A steel belt and dried.

The drying is effected by conventional methods, such as IR-irradiation, warm or hot air, or by direct heating of the belt, the removal by the usual method of scraping off.

EXAMPLE 8

1.0 kg. of finely ground cigar, cigarette tobacco or waste material thereof is mixed with up to 5 percent by weight of polyphosphate based on the tobacco weight, and with 5 liters of water. While stirring well, the mixture is allowed to stand for a while. To this mixture are added 5–10 percent by weight of a plasticizer, e.g., glycerol and 2 percent by weight of carboxymethyl cellulose, based on the tobacco weight. The mixture is homogenized and the resulting mass is spread on a steel belt in the desired thickness.

The further processing of the material is effected in the manner described in example 1.

Waste tobacco material obtained in the production of cigarettes is finely ground to an average particle size of about 50μ. 1.0 kg. of this finely ground material is mixed with about 5 percent by weight based on the weight of the tobacco of polyphosphate and with 5 liters of water. The mixture is stirred while heating at a temperature of 80°C for about 45 minutes. To this mixture is added 5 percent by weight, based on the weight of the tobacco, of glycercine and 2 percent by weight based on the weight of the tobacco of carboxymethyl cellulose. The mixture is homogenized to form a pulp which is then processed into sheet material in accordance with the manner of example 1.

EXAMPLE 9

1 kg. of tobacco material ground to a grain size of about 50μ is first treated for 10 to 20 minutes with saturated steam (100°C) after the addition of about 3 percent by weight of sodium acetate, and thereupon mixed in mechanical mixers with water to form a paste.

After adding 5–10 percent by weight of glycerol, the paste is further worked up as in the above example 1.

In the above-described manner, 1.0 kg. of waste cigarette tobacco material having an average grain size of about 50μ is treated for 15 minutes with saturated steam (100°C). There is added about 3 percent by weight based on the weight of the tobacco material of sodium acetate and the resultant is mixed in mechanical mixers with water to form a pulp. About 8 percent by weight, based on the weight of the tobacco material, of glycercine is added along with about 3 percent by weight, based on the weight of the tobacco material, of carboxymethyl cellulose. The resultant paste is then processed to form a tobacco sheet material in accordance with the method of claim 1.

EXAMPLE 10

1.0 kg. of finely ground cigar tobacco is slurried with 0.25 to 0.35 percent by weight of solid potassium carbonate, based on the tobacco weight, in 4–6 liters of water, and further worked up as in example 8.

The procedure described is followed utilizing 0.35 percent by weight of solid potassium carbonate based on the weight of the tobacco material in 6 liters of water. A very satisfactory sheet material is obtained.

EXAMPLE 11

1.0 kg. of dark cigar tobacco (finely ground) is heated at 90°C, with 10 g. asbestos fibers for 30 minutes with 1 percent by weight of ammonium phosphate in 3 liters of water. 1 g. of an aqueous swollen pectin solution of 2 percent concentration is then added after stirring well and adding 3 percent by weight of a plasticizer, e.g., glycerol, whereupon the mixture is processed according to any one of the above examples.

1.0 kg. of finely ground dark cigar tobacco having an average grain size of about 50μ is, according to the above-described method, heated at 90°C with 10 g. of asbestos fibers for 30 minutes in admixture with 1 percent by weight, on the weight of the tobacco material, of ammonium phosphate in 3 liters of water. To this solution is added 1 kg. of an aqueous swollen pectin solution having a 2 percent concentration. The resultant is stirred well and to the mixture is added 3 percent by weight of glycercine, based on the weight of the tobacco material. The resultant pulp is processed in the manner of example 1 to obtain a tobacco sheet material.

The following comments apply to examples 12 to 19 set forth in table 1.

The comminuted tobacco is slurried in an aqueous solution of the volume of line D containing the percent by weight set forth in line C. The slurry is heated for the time of line G at the temperature of line F to obtain a pulp. The pulp is cooled as per line H and binder is added as per line I. Fibrous material and potassium formate is added to the pulp as per lines J and K, respectively. The additions of lines L, M and N are carried out by addition to the pulp in the following examples. However, such additions may occur in any of the preceding steps or be sprayed on the resultant sheets before completion of drying.

In example 15, line E, the 1.8 percent by weight relates to the entire quantity of tobacco, thus including the second kilogram added in accordance with line P. This second addition of tobacco (which is of the same quality as the first addition) is made to the slurry after cooling.

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<td>B</td>
<td>Cigarette tobacco,</td>
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<td>C</td>
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<td>100μ</td>
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<td>Treatment liquid (chemicals and tap water)</td>
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What is claimed is:

1. A process for producing a tobacco sheet material which consists essentially of

   A. Preparing an aqueous slurry comprising
      1. an aqueous solution having a pH prior to admixture with tobacco of from about 7.5 to about 9 and containing, in an amount of from about 0.1 to about 5 percent by weight of the tobacco material, a substance selected from the group consisting of alkali and ammonium salts of acids from the group of formic acid, acetic acid, citric acid, malic acid, tartaric acid, phosphoric acid and polyphosphoric acid, alkali and ammonium hydroxides, ammonia, ethylenediamine, and mixtures thereof,
      2. substantially dry comminuted tobacco material having an average grain size of up to about 100 µ,
   B. subjecting the slurry to a temperature of not greater than 100°C for a period of about 15 to about 45 minutes to form a pulp,
   C. adding to the resulting pulp from about 0.5 to about 3 percent by weight based upon the weight of the tobacco of carboxymethyl cellulose or sodium carboxymethyl cellulose,

   D. forming a shaped product from the resultant pulp by applying said pulp to a substrate,
   E. drying the resultant shaped product of from about 60 to about 100°C, and
   F. removing the dried product from the substrate.

2. A method as in claim 1 wherein the tobacco material is selected from the group consisting of cured and partially cured tobacco.

3. A method as in claim 1 wherein tobacco waste arising in the tobacco industry is utilized.

4. A method as in claim 1 wherein the shaped product is a sheet.

5. A method as in claim 4 wherein, prior to removal of the dry sheet from the substrate, said sheet is sprayed with an aqueous softener solution.

6. A method as in claim 5 wherein the softener is an aqueous solution of a member of the group consisting of glycerol, sorbitol, and diethylene glycol and mixtures thereof.

7. A method as in claim 4 wherein the pulp sheet has a thickness of about 0.5 mm.

8. A product produced in accordance with the method of claim 1.

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