

[54] PROCESS FOR THE MANUFACTURE OF REGENERATED TOBACCO

[75] Inventors: Monique Beringer, St. Louis, France; Paul Buchmann, Basel, Switzerland

[73] Assignee: Tamag Basel AG, Switzerland

[22] Filed: July 9, 1974

[21] Appl. No.: 486,837

Related U.S. Application Data

[63] Continuation of Ser. No. 337,475, March 2, 1973, abandoned.

[30] Foreign Application Priority Data

Mar. 2, 1972 Luxembourg..... 64888

[52] U.S. Cl.: 131/17 R; 131/2; 131/17 AC

[51] Int. Cl.: A24B 3/14; A24B 13/00; A24B 15/08

[58] Field of Search: 131/2, 15, 17, 140-144

[56] References Cited**UNITED STATES PATENTS**

2,943,959	7/1960	Schafflander	131/2
3,003,895	10/1961	Grunwald	131/17 AD
3,240,214	3/1966	Bavley et al.	131/141
3,429,316	2/1969	Hess	131/17 R
3,478,751	11/1969	Briskin et al.	131/2
3,729,009	4/1973	Stevens et al.	131/2
3,796,222	3/1974	Deszyck	131/2

FOREIGN PATENTS OR APPLICATIONS

908,439 10/1962 United Kingdom..... 131/17

Primary Examiner—Robert W. Michell

Assistant Examiner—V. Millin

Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] ABSTRACT

The present invention provides a homogeneous regenerated tobacco of reduced nicotine content which consists of:

5,000 grams of filler consisting of: one or more of gramineous plants or shells of nuts, cocoa beans or coffee beans,
3,000 to 5,000 grams tobacco
600 grams magnesium formate
50 grams tartaric acid
300 grams potassium nitrate
1,000 grams paraffinurea
300 grams diammonium hydrogen phosphate
10 grams vanillylideneurea
1,500 grams sodium carboxymethylcellulose
1,400 grams glycerine
150 grams diethylene glycol
1,050 grams fruit concentrate
600 grams raw molasses
105 grams malt extract.

4 Claims, No Drawings

PROCESS FOR THE MANUFACTURE OF REGENERATED TOBACCO

This is a continuation of application Ser. No. 337,475, filed Mar. 2, 1973, now abandoned.

The invention relates to a process for the manufacture of regenerated tobacco by shaping from a tobacco paste and consolidation by drying with simultaneous reduction of the nicotine content of the regenerated tobacco as compared to that of the tobacco employed, by mixing the tobacco paste with nicotine-free tobacco substitute paste in the ratio of the desired reduction.

In the manufacture of regenerated tobacco, one endeavours to make the substitute as similar as possible to natural tobacco with regard to elasticity, ability to be cut and tensile strength, so that it can be processed technologically like tobacco. Furthermore, the regenerated tobacco should be capable of burning away and its smoke should be mild, and in particular irritant, acrid and bitter flavour components should be avoided. Nicotine and other disadvantageous or harmful substances of tobacco can be reduced through the amount of the nicotine-free tobacco substitute paste employed.

the greater is the proportion of nicotine-free tobacco substitute paste, the more difficult it becomes to achieve the desired properties resembling natural tobacco.

It is the task of the invention to design a process of the initially mentioned nature so that a regenerated tobacco with very great nicotine reduction and having the abovementioned properties is obtainable, using, as far as possible, waste products which are available in large amount and also in sufficiently constant quality.

The invention is characterised in that the tobacco substitute paste contains the following constituents in addition to water:

Firstly a filler constituent which consists of one or more of the following filler components: wheat chaff, oat chaff, chaff of other types of gramineous plants, wheat straw, oat straw and straw of other types of gramineous plants, wheat bran, oat bran, bran of other types of gramineous plants, coffee bean shells, coconut shells, coconut fibres, cocoa bean shells and fibres, as well as shells of other types of nuts;

secondly, an active substance constituent which consists of several of the following active substance components: fruit concentrate, raw molasses, caramel and malt extract, in particular in an amount which suffices, including the contents of all other paste constituents of the tobacco substitute paste, to give a total content, of the total constituents of the paste, of at least 1 percent by dry weight of aminoacids and of at least 5 percent by dry weight of sugars;

thirdly, a nitrogen donor constituent which consists of several of the nitrogen donor components potassium nitrate, urea and diammonium hydrogen phosphate and in particular in an amount which suffices, including the contents of all other constituents of the tobacco substitute paste, to give a total content, of the total constituents of the paste of the regenerated tobacco, of at least 3 percent by dry weight of nitrogen, without taking the aminoacids into account;

fourthly, a structure-forming constituent which consists of one or more of the structure-forming components sodium carboxymethylcellulose (NaCMC) and other cellulose derivatives and raw pectin and

fifthly, a special active substance constituent which consists of one or more of the following special active

substances: plasticisers, flavour-improving and odour-improving agents, agents for improving burning characteristics, and dyestuff;

per 100 parts by dry weight of filler constituent, 10 to 45 parts by dry weight of active substance constituent, 10 to 45 parts by dry weight of nitrogen donor constituent, 10 to 60 parts by dry weight of structure-forming constituent and 20 to 90 parts by dry weight of special active substance constituent are present.

Preferably, 17 to 25 parts by dry weight of active substance constituent, 12 to 26 parts by dry weight of nitrogen donor constituent, 27 to 33 parts by dry weight of structure-forming constituent and 48 to 62 parts by dry weight of special active substance constituent are present per 100 parts by dry weight of filler constituent.

the paste which is shaped to give the so-called "regenerated" tobacco thus contains a constituent referred to as "tobacco paste" which contains tobacco or tobacco scrap, and a nicotine-free component referred to as "tobacco substitute paste" which contains non-tobacco plants and chemicals etc. It is not necessary that these two constituents should be brought together in a ready past form; all that is important is that these constituents should be present in the paste which is shaped to give the regenerated tobacco.

By coffee bean shells there are meant the natural sheaths of the coffee beans, also referred to as coffee bean pods.

The paste constituents of the tobacco substitute paste, which fulfil different tasks, are preferably mixtures of several different components in order to avoid the peculiarities of a single component standing out in the smoke and causing the unpleasant after-taste which is characteristic of numerous known tobacco substitutes.

The descriptions "filler component", "active substance component", "nitrogen donor component", "structure-forming component" and "special active substance" relate to the main effect of these components of the paste, which of course does not exclude components from having, alongside their main effect, an entirely desirable side-effect which supplements the main effect of another component. For example, the coconut shell filler component produces a smooth chocolate aroma suggestion in the smoke, that is to say a flavour effect which is a side effect of the coconut shell, alongside the filler effect. Preferably, if two otherwise equivalent components are available, those whereof the side effects assist the main effect desired from other constituents of the paste are preferred. For example, a flavour component which at the same time is a nitrogen donor will be preferred over an otherwise equivalent flavour component which is not a nitrogen donor.

According to the invention, most of the constituents of the substitute paste are raw substances, in contrast to chemically pure substances. The raw substances are preferably natural products or by-products which arise when the former are processed. This is, on the one hand, important for economic reasons because chemically pure substances are more expensive than raw substances, but on the other hand is of considerable advantage for the desired aromatic properties since it has been found that penetrating flavour nuances of individual substances have a considerably less disadvantageous effect in the smoke if these substances are not used in a chemical pure form but in the raw form.

The question of what mechanisms are responsible for this favourable effect has not yet been investigated but presumably acrid flavour nuances of the chemically pure substances are adapted by the "impurities" or by the cell connections which are still present in the raw substances, or they are masked in the aroma.

It is noteworthy that according to the invention tobacco substitute past constituents which contain relatively little cellulose are used. It is furthermore noteworthy that using the invention a tobacco substitute can be manufactured which is of extraordinarily durable suppleness so that the tobacco substitute and the product manufactured therefrom which can be smoked can be stored for a very long time without suffering, on storage, substantial deteriorations in their quality, which frequently has to be tolerated when storing natural tobacco products.

The tobacco substitute paste constituents in themselves produce a nicotine-free tobacco substitute which largely possess the initially mentioned technological and aromatic properties of natural tobacco. For this reason, the mixture, according to the invention, of tobacco paste and tobacco substitute paste gives a favourable result.

It is preferred that the filler constituent and the active substance constituent should consist exclusively of foodstuff wastes from the industrial manufacture of foodstuffs and should together account for at least 50 percent by dry weight of the tobacco substitute paste constituents. Amongst the foodstuff wastes which are available, those fractions which meet the desired properties particularly well, will preferably be used for the manufacture of the tobacco substitute.

The constituents of the tobacco substitute paste can amount to 20 - 80 percent by dry weight of the total paste constituents, and preferably amount to 50 percent by dry weight.

A filler constituent which contains the following filler components: wheat chaff, coconut shells and cocoa bean shells, in particular preferably in the dry weight ratio of approx. 4.2 : 0.5 : 0.3, is preferred.

Various effects are sought by means of the active substance component and for the reasons explained above it is desirable to provide at least three different active substance components for each of these desired effects, namely making up the sugar content, making up the aminoacid content, and plasticising the regenerated tobacco, it being entirely possible for one and the same active substance component to participate in several different effects, as is, for example, the case for fruit concentrate which acts as a sugar donor, as an aminoacid donor, as a structure-forming agent and, in many cases, also as a plasticiser.

The making up of the sugar content and of the amino-acid content by means of the active substance constituent, and the making up of the nitrogen content by the nitrogen donor constituent, serves to ensure that the contents mentioned are not reduced in the regenerated tobacco in the way the nicotine is reduced. These contents are particularly high in natural tobacco as compared to non-tobacco plants and it has been found that these contents carry an important share of the responsibility for the particular properties of natural tobacco which is why they are also, according to the invention, made up in the regenerated tobacco.

The structure-forming constituent serves to impart the necessary strength to the regenerated tobacco and preferably only consists of NaCMC.

A preferred special active substance constituent consists of one or more of the special active substance components: paraffinurea, divanillylideneurea, vanillylideneurea, tartaric acid, glycerine, diethylene glycol, magnesium formate, potassium nitrate and calcium carbonate. The paraffinurea mentioned is an addition compound of liquid paraffin with urea, for example an addition compound in which 8 molecules of urea are present per one paraffin molecule containing 10 carbon atoms. The special active substance components paraffinurea, divanillylideneurea, vanillylideneurea and tartaric acid, have the effect of improving the flavour and improving the odour whilst the components glycerine and diethylene glycol act as plasticisers, that is to say make the regenerated tobacco hygroscopic. The components magnesium formate, potassium nitrate and calcium carbonate improve the burning characteristics and are thus responsible for uniform smouldering and for a white ash.

In the manufacture of the paste, which is then shaped, for example in the form of sheets, filaments, fibres, flocks, ribbons and the like, to produce the regenerated tobacco, water is required for making up and then has to be evaporated again in part, with expenditure of energy, in order to consolidate the regenerated tobacco. The use of little water saves energy during evaporation but makes it more difficult to manufacture a homogeneous paste and to shape the latter to give the regenerated tobacco. A process which manages with very little water when manufacturing the paste is characterised in that 4 to 2, preferably 2, parts by weight of water are added to 1 part by weight of the filler constituent plus the tobacco, a suspension is formed therefrom, which is then ground wet, and that then the remaining constituents of the paste are mixed in and the resulting paste is homogenised by kneading and is then shaped and consolidated, by subsequent drying, to give the material which can be smoked. Kneading can be carried out, for example, with kneaders or with a roll mill, as is known and customary in the manufacture of ointments, creams and the like in the pharmaceutical and cosmetic industry. The shaping can also be effected by means of such a roll mill.

If a fairly large proportion of water is used for the manufacture of the paste, milling can be dispensed with and the requisite homogeneity can be achieved by stirrers alone. An embodiment of this type of the process according to the invention is characterised in that using water and paste constituents in the weight ratio of about four to one, a suspension is first formed from the filler constituent which has been ground dry and from the tobacco and about half the water, the suspension is then ground wet and the remaining constituents of the paste are then stirred in whilst adding the second half of the water.

It is also advantageous if the nicotine-free tobacco substitute paste is first formed and the pre-pulverised tobacco is then mixed into it.

In addition to the manufacturing process, the invention also relates to a regenerated tobacco consisting of the paste constituents of the shaped paste which are not volatile during drying for the purpose of consolidation, and of residual water.

The tobacco employed can be natural tobacco, waste tobacco and their mixtures.

Examples of the individual components of the mixture of the tobacco substitute constituents are given below. These components are classified under the indi-

vidual constituents according to their main effect, and where there is an important side-effect the latter is mentioned in brackets after the component in question. Components which are preferred either for economic reasons or because of their particular effect are described as preferred components, whilst other components which are not as advantageous but are also entirely usable, are described as usable components.

Preferred components for the filler constituent are chaff (latin: Palea), bran (latin: Furfur) and straw of wheat, oats and rice, cocoa bean shells and coconut shells (all of them also acting as structure-forming agents).

Examples of usable components for the filler constituent are chaff, straw and bran of barley, rye, maize, flax and other types of gramineous plants and coffee bean shells (all of them also acting as structure-forming agents).

Preferred components for the active substance constituent are fruit concentrate as a sugar donor and plasticiser (structure-forming agent and flavour-improving agent), raw molasses as a sugar donor and nitrogen donor (plasticiser, aminoacid donor and colouring agent), caramel as a sugar donor (colouring agent) and malt extract as a nitrogen donor and sugar donor (plasticiser and colouring agent). The fruit concentrate consists of the fruit residues which arise in the manufacture of fruit juice.

Preferred components for the nitrogen donor constituent are potassium nitrate (which improves the burning characteristics), divanillylideneurea and diammonium hydrogen phosphate.

Examples of usable components for the nitrogen donor constituent are glycine, vanillylideneurea, betaine, ammonia and other ammonium compounds.

Preferred components for the structure-forming constituent are raw pectin and NaCMC.

Examples of usable components for the structure-forming constituent are pectin, methylcellulose and other cellulose derivatives, as well as cellulose fibres.

Preferred plasticiser components for the special active substance constituent are glycerine and diethylene glycol.

Examples of usable plasticiser components for the special active substance constituent are 70 per cent strength sorbitol and mixtures of sorbitol and glycerine.

Preferred flavour-improving or aroma-favouring components for the special active substance constituent are paraffinurea, vanillylideneurea, divanillylideneurea (nitrogen donors), tartaric acid, liquid paraffin and Flavor (sic).

An example of a usable flavour-improving and aroma-favouring component for the special active substance constituent is the residue containing caffeine as obtained in the manufacture of caffeine-free soluble coffee powder (nitrogen donor and aminoacid donor).

Preferred components which improve the burning characteristics, for the special active substance constituent, are magnesium formate, potassium nitrate (nitrogen donor) and calcium carbonate (filler).

Preferred dyestuff components for the special active substance constituent are natural tobacco extract, active charcoal, caramel and coffee grounds.

The tobacco employed is natural tobacco in the fermented or otherwise pretreated or raw state. Preferably, the natural tobacco wastes are especially tobacco wastes such as arise in the manufacture of tobacco products.

EXAMPLE 1

2,000 grams of wheat chaff, 2,000 grams of oat chaff, 500 grams of coconut shells and 500 grams of cocoa bean shells and 3,000 grams of tobacco are ground dry and suspended in 33 liters of water, and the suspension is ground wet at a temperature between 45 and 55° centigrade.

600 grams of magnesium formate, 150 grams of tartaric acid, 300 grams of potassium nitrate, 690 grams of urea, 300 grams of diammonium hydrogen phosphate and 7.5 grams of vanillin, in powder form, are stirred into 30 litres of water until all has dissolved. 450 grams of asbestos, 600 grams of calcium carbonate, 300 grams of liquid paraffin, 1,125 grams of NaCMC and 50 grams of pectin are stirred into this solution, whilst stirring vigorously (sic). The solution is stirred vigorously for about 5 minutes and is then left to stand for 30 minutes, being stirred briefly every 5 minutes. Thereafter 75 grams of glyoxal are poured in whilst stirring.

The abovementioned suspension is then stirred into the solution thus produced and a paste forms, into which 1,350 grams of glycerine, 150 grams of diethylene glycol, 1,000 grams of fruit concentrate, 600 grams of raw molasses, 100 grams of caramel and 150 grams of malt extract are then stirred.

The paste is spread on a continuous belt and consolidated by drying to give a sheet.

According to this example, approx. 20 parts by dry weight of active substance constituent, approx. 26 parts by dry weight of nitrogen donor constituent, approx. 30 parts by dry weight of structure-forming constituent and approx. 60 parts by dry weight of special active substance constituent are present per 100 parts by dry weight of filler constituent amongst the tobacco substitute constituents that is to say leaving out of account the tobacco employed.

EXAMPLE 2

1,000 grams of wheat bran, 1,000 grams of wheat straw, 1,000 grams of rice chaff, 1,000 grams of oat straw, 500 grams of coconut shells with fibres and 500 grams of cocoa bean shells and 40,000 grams of tobacco are ground dry and suspended in 110 litres of water, and the suspension is ground wet at a maximum temperature of 60° centigrade.

The following components are introduced into the suspension thus produced: 500 grams of magnesium formate, 300 grams of tartaric acid, 100 grams of potassium nitrate, 500 grams of urea, 400 grams of diammonium hydrogen phosphate, 7.5 grams of vanillin, 450 grams of asbestos, 400 grams of calcium carbonate, 450 grams of liquid paraffin, 900 grams of NaCMC, 200 grams of raw pectin, 150 grams of glyoxal, 800 grams of glycerine, 650 grams of diethylene glycol, 850 grams of fruit concentrate, 1,000 grams of raw molasses, 100 grams of active charcoal, 200 grams of malt extract and 50 grams of coffee bean residue, and the mixture is then kneaded in a roll mill to give a homogeneous paste which is then shaped by milling to give a sheet which is consolidated by drying.

According to this example approx. 24 parts by dry weight of active substance constituent, approx. 20 parts by dry weight of nitrogen donor constituent, approx. 30 parts by dry weight of structure-forming constituent and approx. 62 parts by dry weight of special active substance constituent are present per 100 parts by dry weight of filler constituent amongst the tobacco substitute constituents.

tute constituents that is to say leaving out of account the tobacco employed.

EXAMPLE 3

As in Example 2, with the sole difference that instead of the 1,000 grams of wheat bran and 1,000 grams of wheat straw, 2,000 grams of maize straw are employed.

Example 4

As in Example 1, with the sole difference that instead of the 500 grams of cocoa bean shells and 500 grams of coconut shells, 500 grams of groundnut shells and 500 grams of walnut shells are employed.

EXAMPLE 5

As in Example 1, with the sole difference that instead of the 3,000 grams of tobacco, 10,000 grams of tobacco are employed and instead of the 33 liters of water, 40 liters of water are employed for the suspension.

EXAMPLE 6

As in Example 1, with the sole difference that the 3,000 grams of tobacco are not suspended at the same time but are kneaded as a dry powder into the homogenised paste which already contains all the remaining constituents.

EXAMPLE 7

As in Example 1, with the sole difference that the 3,000 grams of tobacco are not suspended at the same time but are mixed with 8 liters of water and are separately mixed into the homogenised paste which already contains all the remaining constituents.

EXAMPLE 8

4,250 grams of wheat chaff, 500 grams of coconut shells, 250 grams of cocoa bean shells and 3,000 grams of tobacco are ground dry and suspended in 28 liters of water, and the suspension is ground wet at a temperature between 45 and 55° centigrade.

600 grams of magnesium formate, 50 grams of tartaric acid, 300 grams of potassium nitrate, 1,000 grams of paraffinurea, 300 grams of diammonium hydrogen phosphate and 10 grams of vanillylideneurea are stirred into 30 litres of water until all has dissolved. 1,500 grams of NaCMC are stirred into this solution with vigorous stirring. The solution is stirred vigorously for approx. 5 minutes and is then left to stand for 30 minutes, being briefly stirred every 5 minutes.

The abovementioned suspension is then stirred into the solution thus produced, and a paste is formed in which 1,400 grams of glycerine, 150 grams of diethylene glycol, 1,050 grams of fruit concentrate, 600 grams of raw molasses and 105 grams of malt extract are then stirred.

The paste is consolidated by drying to give a tobacco substitute sheet.

According to this example, approx. 18 parts by dry weight of active substance constituent, approx. 12 parts by dry weight of nitrogen donor constituent, approx. 30 parts by dry weight of structure-forming constituent and approx. 51 parts by dry weight of special active substance constituent are present per 100 parts by dry weight of filler constituent amongst the tobacco substitute constituents, that is to say leaving out of account the tobacco employed.

EXAMPLE 9

2,500 grams of rice chaff and 2,500 grams of coffee bean shells and 5,000 grams of tobacco are ground dry and suspended in 25 liters of water, and the suspension is ground wet at a temperature between 45 and 55° centigrade.

600 grams of magnesium formate, 50 grams of tartaric acid, 300 grams of potassium nitrate, 1,000 grams of paraffinurea, 300 grams of diammonium hydrogen phosphate, 10 grams of vanillylideneurea, 1,500 grams of NaCMC, 1,400 grams of glycerine, 150 grams of diethylene glycol, 1,050 grams of fruit concentrate, 600 grams of raw molasses and 105 grams of malt extract are stirred into this suspension.

The mixture thus produced is then kneaded in a roll mill to give a homogeneous paste which is then shaped by milling to give a sheet which is consolidated by drying.

According to this example, approx. 18 parts by dry weight of active substance constituent, approx. 12 parts by dry weight of nitrogen donor constituent, approx. 30 parts by dry weight of structure-forming constituent and approx. 51 parts by dry weight of special active substance constituent are present per 100 parts by dry weight of filler constituent amongst the tobacco substitute constituents, that is to say leaving out of account the tobacco employed.

EXAMPLE 10

As in Example 9, with the sole difference that 5,000 grams of rice chaff are employed instead of the 2,500 grams of rice chaff and 2,500 grams of coffee bean shells.

All weights quoted in the examples relate to the paste constituents with their natural water content or content of water of crystallisation.

We claim:

1. A homogeneous regenerated tobacco of reduced nicotine content which consists of:

5,000 grams of filler consisting of: one or more of gramineous plants or shells of nuts, cocoa beans or coffee beans,

3,000 to 5,000 grams tobacco

600 grams magnesium formate

50 grams tartaric acid

300 grams potassium nitrate

1,000 grams paraffinurea

300 grams diammonium hydrogen phosphate

10 grams of vanillylideneurea

1,500 grams sodium carboxymethylcellulose

1,400 grams glycerine

150 grams diethylene glycol

1,050 grams fruit concentrate

600 grams raw molasses

105 grams malt extract.

2. Regenerated tobacco according to claim 1, wherein the filler consists of:

4,250 grams wheat chaff

500 grams coconut shells

250 grams cocoa bean shells.

3. A regenerated tobacco according to claim 1, wherein the filler consists of:

2,500 grams rice chaff and

2,500 grams coffee bean shells.

4. A regenerated tobacco according to claim 1, wherein the filler consists of 5,000 grams of rice chaff.

* * * * *