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PROCESSING OF SMOKING TOBACCO

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This invention concerns improvements relating to the treatment or processing of tobacco. An object of the invention is to provide a simple and practicable means by which the aroma and smoke flavour of a smoking tobacco can be improved or modified. Such improvement may be desirable because the tobacco is of a low grade or suffers losses of aroma or flavour constituents in the course of its preparation.

Some of the more volatile aroma or flavour constituents of tobacco are in fact lost during conventional processing of leaf-tobacco into a form suitable for smoking purposes. Attempts have been made to avoid these losses, for example by operating at low temperatures during conditioning, blending and cutting operations, but these have been only partially successful. Attempts to recover the aromatic substances from the atmosphere have also proved difficult or impracticable. The present invention seeks, inter alia, to provide means by which volatile aromatic substances in tobacco can be extracted and used to make up losses from tobacco processed in the usual way.

According to the invention, tobacco, preferably in a ground state, is extracted with a chilled solvent such as ice-cold water and the liquid obtained by the extraction is solidified and freeze-dried. Preferably, a filter is employed to retain the tobacco during the extraction. Thus, the extraction may be carried out in conjunction with gravity filtration, using a filter mat of such porosity that the chilled solvent passes through at a sufficient rate to obviate substantially decomposition of the more unstable aroma and flavour constituents. For example, a rate of about 3-6 ml./minute may advantageously be used. The effluent liquid may be collected in a receiver maintained at a temperature substantially below 0° C., so that it freezes almost immediately on contact with the walls. On completion of the extraction, the solidified liquid is freeze-dried, yielding a pale-brown product of high aromaticity.

This product, in the form of a fine powder, can be used to impart flavour and aroma to conventionally prepared smoking tobacco either by adding up to, say, 10%, but preferably 5%, of the powder to the tobacco, for example to cut cigarette tobacco immediately prior to the cigarette-making process, or by adding a minor proportion to materials used for packaging completed cigarettes. Alternatively, the powder may be redissolved in chilled solvent and added by means of a spraying device. The powder may also be used as a component of reconstituted tobacco products.

By such methods, which can be easily applied in practice, the impact aroma and smoke flavour of cigarettes can be appreciably changed by adding to the tobacco a freeze-dried extract from an aromatic or characterful tobacco. This may be done (a) to modify low grade flue-cured tobacco in such a manner that the smoke flavour is similar to that of a higher grade tobacco already familiar to the customer; (b) to develop a more aromatic type of smoking product from flue-cured tobacco; (c) to permit low grade aromatic tobaccos which are otherwise not acceptable to be utilized. In cases (a) and (b), the raw material used to change the smoke

flavour may be available from waste tobacco sources. In all cases, the flavouring tobacco may be a relatively cheap material.

Examples of ways of carrying the invention into effect will now be more fully described:

Example 1

(a) 100 parts of aromatic fire-cured tobacco were reduced to 1/8 inch diameter particles and extracted with chilled, preferably ice-cold, water using 6 parts by weight of water to each part of tobacco. The extraction was carried out at a rate of 5 ml./minute by percolation of the ice-cold water through a bed of the tobacco particles supported by a filter screen.

In the extraction, it is important that the period of contact between the chilled water and the tobacco should be substantially the same regardless of the quantity of tobacco. This involves co-relating the total flow-rate to the area and porosity of the filter and the depth of the bed of tobacco. A flow-rate of 3-6 ml./min. may suitably be employed for a 2 inch depth of bed supported by a 4 inch diameter screen with a range of maximum pore diameters of 15-40 microns (i.e. Grade No. 3 of British Standards Specification 1752 "Laboratory Sintered or Fritted Filters"). Variations of the three parameters to give the required contact period for different quantities of tobacco with different sizes of equipment can be calculated.

The effluent liquid from the extraction was immediately frozen by being cooled to about -50° C., at which temperature substantially all the material extracted remains involatile and chemically inert. The water was then removed by freeze-drying carried out with the frozen effluent at -50° C., a drying chamber temperature of 28° to 40° C., preferably 35° C., and a pressure decrease from about 0.1 mm. mercury at the commencement of the operation to about 0.05 mm. at its completion. These conditions were maintained until the temperature of the residue attained the temperature of the drying chamber. At this temperature, the dried residue was substantially stable chemically. 19 parts of a fine, pale-brown, powder were produced.

The two temperatures, -50° C. and +35° C., were chosen to ensure not only that the extracted material remained virtually constant in its chemical composition during processing, but also to give a reasonable value for the water-vapour pressure over the icy mixture during processing and to avoid an unduly long processing time.

Pulverisation of the product of the freeze-drying process under the conditions specified was unnecessary, but if the frozen effluent had a higher concentration of extracted material, a highly friable flake may be produced which would require pulverisation.

(b) The powder produced in the above-described manner was dusted evenly onto a blend of cut tobacco rag of high quality to give an addition of 5% by weight of the powder to the original weight of the cut tobacco. The material so obtained was made into cigarettes and was smoked by a panel of smokers in comparison with cigarettes made from untreated similar tobacco. A majority of the panel noticed a marked enhancement of the flavour characteristics of the smoke from the treated cigarettes.

Example 2

Powder produced as in Example 1(a) was dusted evenly onto a blend of cut tobacco rag of low quality to give an addition of 5% by weight of the powder to the original weight of the cut tobacco. Cigarettes made from this material were smoked by a panel of smokers in comparison with cigarettes made from untreated simi-

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of tobacco. A marked improvement and enhancement of the flavour of the smoke from the treated cigarettes was noticed.

Example 3

(a) 100 parts of an aromatic Burley tobacco were treated according to Example 1(a). 21 parts of a fine pale-brown powder were produced.

(b) Using this powder, the procedure described in Example 1(b) was carried out. A panel of smokers again noticed a marked enhancement of the flavour characteristics of the smoke derived from the cigarettes made from the treated tobacco.

Example 4

Using the powder produced in accordance with Example 3(a), the procedure described in Example 2 was carried out. A panel of smokers noticed a marked improvement of the flavour of the smoke from the cigarettes made from the treated tobacco.

We claim:

1. A method of treating tobacco comprising preparing a bed of ground tobacco disposed on a filtering means having a porosity such that a solvent passing through the bed is controlled at a sufficient rate so as to obviate substantially decomposition of the more unstable tobacco aroma and flavor constituents contained in the liquor; extracting the ground tobacco with an ice-cold solvent by percolation of the solvent through the bed of tobacco; rapidly freezing the liquor by subjecting the liquor to a temperature substantially below the freezing point of the solvent so that all of the material extracted remains substantially involatile and chemically inert and then freeze drying the frozen liquor by subjecting the frozen liquor to reduced pressures while maintaining the liquor in a frozen state until the flavor and aroma constituents extracted from the tobacco are free of solvent.

2. A method as claimed in claim 1, wherein the solvent is ice-cold water.

3. A method as claimed in claim 1, wherein the tobacco is reduced to about $\frac{1}{8}$ inch particle size and is extracted with ice-cold water, using 6 parts by weight of water to each part of tobacco, by percolating the water through the tobacco, supported as a bed on a filter screen, at a rate of about 5 ml./per minute, the percolated liquor being rapidly frozen and the water removed by freeze drying.

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4. A method of treating tobacco as set forth in claim 1 wherein the freeze dried flavor and aroma constituents are added to a smoking tobacco in a proportion up to 10% of the freeze dried material based on the weight of the smoking tobacco.

5. A method of preparing an improved flavor and aroma tobacco smoking product comprising preparing a bed of ground tobacco disposed on a filtering means having a porosity such that a solvent passing through the bed is controlled at a sufficient rate so as to obviate substantially decomposition of the more unstable tobacco aroma and flavor constituents contained in the liquor; extracting the ground tobacco with an ice-cold solvent by percolation of the solvent through the bed of tobacco; rapidly freezing the liquor by subjecting the liquor to a temperature substantially below the freezing point of the solvent so that all of the material extracted remains substantially involatile and chemically inert and then freeze drying the frozen liquor by subjecting the frozen liquor to reduce pressures while maintaining the liquor in a frozen state until the flavor and aroma constituents extracted from the tobacco are free of solvent, and then adding the freeze dried flavor and aroma constituents to smoking tobacco in a proportion up to 10% by weight of the aroma material based on the weight of smoking tobacco and then forming a smoking tobacco product.

6. A method as claimed in claim 5, wherein the said product, in the form of a fine powder, is dusted upon the said smoking tobacco.

7. A method as claimed in claim 5, wherein the said product is added in a proportion of about 5% of the said smoking tobacco.

8. A smoking tobacco product made by the method of claim 5.

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