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TOBACCO PRODUCT

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This invention relates to a process rendering tobacco resistant to staling and to the tobacco product thereof.

Tobacco products possess the best characteristics and condition at some recognized time. This may coincide with the completion of their production or preparation or may be arrived at as a result of ageing or curing. The question of staleness or freshness involves many elements of condition and it is not completely definable but is clearly evidenced by a variety of definite factors including, among others, loss of the perfection of aroma and condition; decomposition; alteration in appearance; or a combination of such factors.

It is an object of this invention to provide a process whereby tobacco products which are normally subject to staling are rendered resistant to a high degree to such staling, and to provide tobacco products normally subject to staling which are substantially resistant to staling, the staling referred to being especially, but not exclusively, such as is incident to oxidation.

In the practice of this invention there is added to or incorporated in a tobacco product that is normally subject to staling, a staling-resistant or anti-staling agent, and the product resulting is a tobacco product that is resistant to staling. Obviously, the retention of its original perfection of condition by the product of the present invention is not perpetual, but with the benefit of usual precautions, especially such precautions as preventing loss of moisture and contamination from external sources, the tobacco product of the present invention remains useful, and usually as desirable as when first prepared, for periods many times as long as does the same tobacco product prepared without the use of this invention.

The staling-resistant or anti-staling agent does not impair the natural characteristics of the tobacco product. If it is added in the form of a solution or dispersion in liquid, as is preferable inasmuch as effective distribution throughout the tobacco product is thereby facilitated, the liquid is preferably water but should be one that imparts no undesirable characteristic to the tobacco. It may be added to certain tobacco products by application to the surface thereof, in which case it is preferably so selected and put into such condition that it will be absorbed by or infused in the tobacco product or will otherwise penetrate the tobacco product. It may be worked into the tobacco product. It may or may not be added before the completion of the preparation of the tobacco product and may or may not be altered in the treatment to which the tobacco product is subjected such as completion of the preparation of the tobacco product for use, so long as any such alteration does not destroy the effectiveness of the stalling-resistant. It is preferably substantially non-volatile at the temperatures to which the tobacco product is subjected after the staling-resistant is added thereto. In the practice of this invention, the stalling-resistant or anti-staling agent may consist of one of the substances of the class or classes herein mentioned, or of a mixture of two or more such substances, or a mixture of one or more of such substances with one or more other substances that may or may not have staling-resistant or anti-staling properties.

The staling-resistant or anti-staling agent employed in the practice of this invention may consist of one or of a mixture of a wide variety of substances so long as it renders the tobacco product resistant to staling as herein defined and possesses other properties above-mentioned. Illustrative examples of substances that may be employed in the practice of this invention are substances meeting the foregoing requirements and which are organic derivatives of ammonia in which at least one organic radical attached to nitrogen contains more than one OH group, or salts of such derivatives. As a rule, aliphatic compounds are preferable since it is generally accepted that aromatic derivatives as a class tend to show toxic effects. Among the aliphatic derivatives, any compound capable of leading to the formation of ethylene glycol or oxalic acid may not be considered useful in this invention since they are toxic. It is further necessary that the anti-staling compound, in view of the relatively small amounts used, must be quite well dispersed in the tobacco to be protected. Hence, a soluble compound is indicated, and in practically all cases solubility in water is to be preferred. The organic derivatives of ammonia of the class above-mentioned tend to show adequate solubility in water provided a molecular weight of the organic residue is not excessive. The choice of such organic derivatives is further narrowed down in that they, when used as a staling preventative, should be non-volatile under the conditions to which it is subjected during the preparation of the tobacco product. The salts, organic and inorganic, of such organic derivatives are useful and frequently preferable, the salts of saturated and unsaturated higher fatty acids

having 8 or more carbon atoms (e. g. stearic and oleic) have advantageous dispersibility in water.

In view of the fact that polyhydroxy aliphatic compounds such as glycerine, and a large number of carbohydrates, such as sugars, such as aldoses, have been well established to be free from any toxic effects on human beings, it is obvious that organic derivatives of ammonia and salts of such derivatives, the organic part of which is related to the above polyhydroxy compounds, are useful in the practice of this invention. Moreover, the salts of such compounds such as the hydrochloric acid salts are in some cases more effective than the free bases.

Among the organic derivatives of ammonia of the class above mentioned (and salts of such derivatives) useful in this invention are products in which the organic part of the derivatives are related, for instance, to polyhydric alcohols such as trihydric alcohol (glycerol); tetra-hydric alcohols (erythritol, pentaerythritol); penta-hydric alcohols or pentites; hexa-hydric alcohols (sorbitol, mannitol); and higher hydric alcohols; to mono-saccharides (arabinone, xylose, mannose, glucose, galactose, fructose); disaccharides (sucrose, cellobiose, maltose, lactose); trisaccharides; and related compounds. Depending on how the hydroxy aliphatic residue is connected with the ammonia, one distinguishes for instance, amino sugars (2-amino glucose); aldehyde-ammonia sugars (glucose ammonia); the so-called osimines (d-glucosimine); the glucamines (d-glucamine). The number of organic derivatives of ammonia in which the organic part is related to such compounds is very large for even one compound. For instance, in case of the compound related to glucose, it is possible that the nitrogen containing group be attached to any one of six carbon atoms of the glucose structure. Many of these compounds have been described, for instance 1-amino glucose, 2-amino glucose, 3-amino glucose, 6-amino glucose. Other compounds are isoglucosamine, epiglucosamine, glucose ammonia, d-glucosimine, d-diglucosimine, ethylaminoglucose, dimethylaminoglucose, diethylaminoglucose. Many other variations are possible. Similar derivatives are known of other sugars and a few examples are listed, for instance, lactose ammonia, l-arabinosamine, d-l-fructosamine, d-dimannosimine, 6-aminogalactose, maltosimine. Many such compounds are obtainable by the action of ammonia, or also substituted ammonias, on sugars, such as aldoses such as glucose. For others of such compounds more complicated methods of preparation are available. However, there exists often some doubt as to the actual structure of any one compound; and since any such compound may rearrange or condense in a number of ways, it is difficult to know which compound, or which mixture, is actually in hand, or which product is formed during the preparation of the tobacco product to which the product may have been added. The ammonia derivatives of this invention may be produced by direct reaction of the ammonia with the polyhydroxy aliphatic compound such as sugars such as aldoses such as glucose, or by reaction of more complex compounds which produce the desired derivative, as in the formation of glycerylamine and d-glucosamine herein described. By the use of the staling-resistant of this invention, all necessary resistance to staling can be effected without impairing the condition or appearance of the tobacco product.

In general, in the practice of the invention, the staling-resistant or anti-staling agent is included or incorporated in the tobacco product, preferably by incorporating or adding a small proportion thereof in such manner that it is dispersed or infused in such liquid as is present in the tobacco product during the preparation of the tobacco product; or by adding it to the exterior of a tobacco product in which it cannot be dissolved or dispersed, such addition to the exterior of the tobacco product preferably being by the application of a solution or dispersion in order to obtain effective distribution throughout the surface of the product.

Below are given examples of the practice of this invention. It is to be understood that this invention is not limited thereto but that the examples are merely illustrative.

To two samples of "Chesterfield" cigarettes the reaction product of glucose and ammonia was added to the extent of 0.33% and 0.5% by weight, respectively, by adding solutions of the reaction product with a hypodermic needle and drying the cigarettes in a vacuum at room temperature. One month after treatment the treated samples were found by all of three observers to be fresher in taste, to produce less acrid smoke, and to be free of stale flavor that was noticeable in untreated samples of the same age. To "Haddon Hall" cigars 0.5% by weight of the reaction product of glucose and ammonia was added by spraying a solution on the cigars and drying them in a vacuum. After a month, the treated sample had a more pleasant odor and afforded a pleasanter smoke than the untreated sample. Treatment of the leaf before it is rolled into cigars is preferred. Three samples of bright-cured longleaf Virginia tobacco were treated respectively with 0.33%, 0.5% and 1.0% by weight of the reaction product of glucose and ammonia dissolved in water and sprayed on the tobacco, an equal amount of water being sprayed upon a control sample. All samples were dried in vacuum at room temperature. After 32 days' storage in closed jars equipped with moistening pads the treated sample tasted more bland and was free of bitterness that was very noticeable in the untreated sample. When smoked the treated sample was definitely superior and the untreated sample had a pronounced bite and was definitely acrid in the nasal passages, while the treated samples were smooth and pleasant.

From the foregoing, it will be seen that the staling-resistant may be introduced to the tobacco by treating the tobacco with an aqueous solution of the staling-resistant followed by drying. Generally, the amount of staling-resistant introduced will not be more than about 1.0% by weight. In the case of cigars, the staling-resistant may be introduced by treating the already formed cigars with an aqueous solution of the staling-resistant followed by drying in a vacuum if desired, or the leaf tobacco from which the cigars are to be formed may be treated with an aqueous solution of the staling-resistant, dried at least partially, and formed into cigars.

The fact that the compounds useful in this invention may not only be used in the free form, but are also found to be effective when partly or completely reacted with acids or suitable related products, has appreciable value.

While it is impossible to specify the most desirable form and quantity of staling-resistant to be employed, the foregoing will give one skilled in the art sufficient information to choose the ma-

terial and the proportions most suitable under the circumstances. Without limitation thereof, a range of 0.1% to 1.0% by weight of the staling-resistant would include most cases, with 0.4% to 0.6% at an optimum for many instances.

This application contains subject matter of my application, Serial No. 147,385, filed June 9, 1937, and matured into U. S. Patent No. 2,152,602 March 28, 1939.

What I claim and desire to protect by Letters Patent is:

1. Tobacco to which has been added a small amount of a product of the direct reaction of an aldose with ammonia.

2. Tobacco to which has been added a small amount of a product of the direct reaction of ammonia with glucose.

3. Tobacco to which has been added a small amount of glucosimine.

4. Tobacco to which has been added not more than about 1.0% by weight of a product of the direct reaction of glucose with ammonia.

5. The process of rendering tobacco staling-resistant which comprises adding thereto a small amount of a product of the direct reaction of glucose with ammonia.

6. The process which comprises incorporating into tobacco a small amount of a product of the direct reaction of an aldose with ammonia.

7. The process of rendering tobacco staling-resistant which comprises treating it with a solution of a product of the direct reaction of ammonia with glucose.

8. The process of rendering tobacco staling-resistant which comprises treating it with an aqueous solution of a product of the direct reaction of ammonia with glucose, and drying.

9. The process of rendering tobacco staling-resistant which comprises adding thereto not more than about 1.0% by weight of a product of the direct reaction of glucose with ammonia.

10. As a new article of manufacture, a cigarette, a tobacco of which has incorporated therein a small amount of a product of the direct reaction of ammonia with glucose.

11. As a new article of manufacture, a cigar, the tobacco of which has incorporated therewith a small amount of a product of the direct reaction of ammonia with glucose.

12. The process which comprises treating leaf tobacco with an aqueous solution of a reaction product of an aldose with ammonia, at least partially drying, and forming the tobacco into cigars.

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