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TREATMENT OF TOBACCO

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This invention relates to the treatment of tobacco. It includes new methods of treating tobacco to improve its appearance and smoking qualities and includes the new products produced.

According to this invention gums, oils, nicotine and mineral matter are removed from the leaves which are then impregnated with organic matter and mineral matter to give the tobacco the proper flavor and burning properties. I find that by treatment for a short time in a hot nitric acid bath the gum can be quickly removed and by subjecting a leaf suitable for a cigar wrapper to such treatment I obtain a product which is light and uniform in color and which on impregnation with a properly colored solution yields a leaf in every way suitable for use as a cigar wrapper. By treating dark or gummy leaves in this way I obtain wrappers which are superior in both appearance and smoking qualities.

I dip the tobacco in a hot bath of nitric acid and I prefer to leave the tobacco in the bath until substantially all of the gum and also mineral matter, oils and nicotine have been dissolved out of the leaf. I find it advantageous to add a substance such as phosphoric acid to the treating bath, to prevent the nitric acid from staining the woody and starchy components yellow, and I prefer to use phosphoric acid because it colors them a greenish shade. After the acid treatment, the tobacco is thoroughly washed and preferably then treated in a neutralizing bath such as a lime bath. After the lime treatment, I find it desirable to dry the tobacco before impregnating it with mineral salts and organic materials which give the tobacco the proper flavor, aroma, and burning qualities. The impregnating solution is referred to herein as the burning solution. After treating the tobacco in the burning solution, it is preferably subjected to a glycerine treatment and then dried.

In preparing leaves for use as wrappers, care must be taken not to tear or otherwise injure them. Special handling apparatus may be employed for this purpose. The process is of particular value in the treatment of wrapper tobaccos such as Sumatra wrappers, Java wrappers, Connecticut shade-grown wrappers, Florida wrappers, Connecticut broad leaf wrappers, Kentucky wrappers and Ohio wrappers.

For example, in the treatment of Sumatra or Connecticut shade-grown wrappers, I load the leaves tied into bundles or hands, each containing about 25 to 30 leaves, into a basket so that the butts of the tobacco, that is, the stem ends

of the leaves, are at the bottom when the basket is immersed in the acid bath, the tips of the leaves pointing upward. In loading the tobacco into the basket, I do not crowd it but allow sufficient access of the acid to the leaves to permit the removal of the gum from the color and other cells. Instead of using a basket, I may attach the butt ends of the leaves or hands of tobacco to a plunger which is forced to the bottom of the bath, thus leaving the leaves free to assume an upright position in the bath. Various means of inserting the leaves into the acid bath may be employed.

I have used a bath containing seven percent of concentrated nitric acid with a specific gravity of 1.42 and one percent of 85 percent syrupy phosphoric acid. I heat the bath to preferably about 160° to 180° F. and subject the tobacco to the action of the bath for only a few minutes, for example from three to ten minutes, the time depending upon the strength and temperature of the bath. The treatment is controlled so as to prevent the leaf from being weakened and rendered unsuitable for use as a wrapper. For Sumatra wrappers, treatment in a bath of the above composition at 170° F. for about seven minutes is sufficient. All the gum is removed from the leaves, together with mineral matter and the leaves become thin and light in color. On removing the leaves from the acid bath they are subjected immediately to washing, preferably first with water and then with a base and with gradual reduction in the temperature of the treating solutions to avoid closing the color and feeding cells. For example, the leaves may be first washed in a tank of filtered water kept at about 150° F. After staying in this bath for only about thirty seconds, I remove them to another tank containing water at about 125° F. I prefer to keep this water fresh by continuously adding fresh water to it and withdrawing used water from it. After about fifteen minutes or when the leaves are neutral to blue litmus paper pressed between them, they are removed to the lime bath. I find it advantageous to use a lime bath containing about one-half an ounce of oxide of lime to three gallons of water which is filtered to free it from any undissolved lime before it is used in the treatment of the tobacco. I soak the leaves five to ten minutes in such a lime bath maintained at 125° F. to neutralize any remaining acid.

The tobacco is then dried by placing it on racks in a drying room and kept at about 110° F. until dry, that is, until the leaves have not more than ten percent moisture.

The treated leaf at this stage of the treatment consists essentially of the woody and starch components of the leaf covered with a fibrous skin-like layer. Substantially all of the gums, oils, nicotine and mineral matter including salts have been removed and the leaf is uniformly colored and of a yellowish woody color. This skeleton leaf product may now be treated with various materials to impart the desired color, flavor and aroma to the tobacco and to give it the desired smoking and ashing properties.

The burning solution which I have found advantageous for the treatment of Sumatra wrappers is made up principally of equal parts of the following three solutions, and coloring matter and oils for flavoring may be added as desired. The first solution is prepared by boiling tobacco stems in water. For example, I may take twenty gallons of ordinary Havana stems ground or cut to one inch or less in length and add these to 100 gallons of filtered water and after boiling for about three hours strain the liquid and cool it. It is advantageously strained through about four layers of cheese cloth and one layer of absorbent cotton. I cool it to a temperature of about 70° F. and find that at this temperature such a solution has a gravity of about 4.60 Baumé. Solutions of lower or higher gravity, such as 3.60 Baumé or 5.35 Baumé may be used. Various tobacco extracts of this sort having various concentrations of tobacco constituents may be employed to impart desirable properties to the finished product. The compositions employed for this purpose may vary in strength and composition and may be prepared from various starting materials and may be obtained by different methods of treatment. I prefer to use Havana stems because they contain desirable delicate flavoring and aroma producing materials.

The second and third solutions contain mineral matter to impart proper burning and ashing properties to the finished product. One of these baths is prepared by adding sufficient water to 6½ ounces of potassium acetate, 9¼ ounces of potassium nitrate and three pounds of calcium acetate to make two gallons of solution. The amount of minerals added may be varied and at times different minerals may be employed to impart the required properties to a product. For example, the amount of potassium acetate may be varied between four to eight ounces, the amount of potassium nitrate between five and twelve ounces and the amount of calcium acetate from one to six pounds. For the third bath I use two parts by weight of potassium carbonate dissolved in one hundred parts of water. Although I prefer to prepare the burning solution by mixing three separate solutions as described, the method of preparation and composition may be varied. I do not desire to be bound by the minerals here named or the amounts mentioned as I employ whatever minerals of this nature are necessary or desirable for a given product.

These three baths are then mixed in equal parts by weight and the leaves or hands after drying are saturated with the resulting solution. This may be done by soaking the leaves in the solution for a period of about two hours starting the treatment at a temperature of 125° F. and allowing it gradually to cool to 100° F. during the course of treatment. With burning solutions of different temperature or concentration, different times of treatment may be found to be desirable.

After treating with the burning solution, I find

it advantageous to dip the leaves in a glycerine bath containing one-half percent of glycerine in water. Treatment for twenty seconds in such a bath maintained at 65° F. is satisfactory. After the glycerine dip, the leaves are again placed in the racks in the drying room for 1¼ hours or until the tobacco shows ten percent moisture content.

If the leaves are to be baled, I find it desirable to treat them in a steam room for about one-half hour or until the tobacco is thoroughly moist before packing them.

The same treatment gives good results with Connecticut shade-grown wrapper. For Kentucky and Ohio wrappers which are somewhat thicker than Sumatra wrappers, it is desirable to employ a somewhat higher temperature for example 185° F. with an acid prepared from seven percent concentrated nitric and one percent phosphoric. The time of treatment may be shortened somewhat by employing higher temperatures. In some cases the treatment may be effected at a temperature as low as 155° or 160° F. but care must be taken not to weaken the wrappers and the gum must be entirely removed to form high grade wrappers which are uniformly colored. The heavier tobaccos which contain more gum require a more drastic treatment than the lighter tobaccos.

The composition of the acid bath may be varied. I may, for example, use but five percent nitric acid or acid more concentrated than seven percent. With concentrated acid a somewhat higher temperature would be required.

I find that the color of the final product is improved by adding coloring matter such as chlorophyll green to the burning solution before treating the leaves in it. A small amount of this green produces desirable results. Malachite green or other coloring matter may be employed. Various flavoring materials may be added to the burning solution to modify the taste or other properties of the final product.

In carrying out the acid treatment I use ceramic blending and mixing tanks or iron tanks coated with a heavy enamel which is free from all cracks, pin holes and similar imperfections. The acid must be kept out of contact with iron as iron will give the tobacco a reddish cast which is ordinarily undesirable. The burning solution, wash water and lime water may be handled in heavy cypress wood tanks containing suitable heating coils such as one-half inch brass coils placed near the bottom of the tank. A tank of galvanized iron or enamelware may be used for boiling the Havana stems. The baskets used for the acid dip should be enameled and those used in the burning solution or washing steps may be either enameled wood or galvanized iron.

The drying room may be of any suitable construction. It should be provided with air circulating means and suitable heating devices.

The steam room is advantageously kept at a temperature of about 90° F. and is continuously supplied with steam in sufficient quantity to maintain a high water content per cubic foot.

After removing the gum and mineral matter from the tobacco, it may be stored or shipped to another plant for impregnation with burning solution or it may be treated at the same plant.

I claim:

1. The method of preparing tobacco which comprises removing gum, oils, nicotine and mineral matter from the leaf in an acid bath containing nitric and phosphoric acids.

2. The method of preparing cigar wrappers which comprises removing oils, nicotine, mineral matter and substantially all the gum from a tobacco leaf in a bath containing at least five percent nitric acid at a temperature of at least 155° F.

3. The method of treating tobacco leaves which comprises removing gum from the color cells in a hot bath and then gradually cooling the tobacco in one or more subsequent treating baths to avoid closing the color cells.

4. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkali metal salt of an organic acid, an alkali metal nitrate, an alkali metal carbonate and an alkaline earth metal salt of an organic acid to improve the burning properties of the leaves and a tobacco extract to improve the flavor of the leaves.

5. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkali metal acetate, an alkali metal nitrate, an alkali metal carbonate and an alkaline earth metal acetate to improve the burning qualities of the leaves and a tobacco extract to improve the flavor of the leaves.

6. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkali metal salt of an organic acid to improve their burning qualities and a tobacco extract to improve their flavor.

7. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkaline earth metal salt of an organic acid to improve their burning properties and a tobacco extract to improve their flavor.

8. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkali metal acetate to improve their burning properties and a tobacco extract to improve their flavor.

9. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkaline earth metal acetate to improve their burning properties and a tobacco extract to improve their flavor.

10. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves an alkali metal carbonate to improve their burning properties and a tobacco extract to improve their flavor.

11. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves a tobacco extract to improve their flavor and potassium acetate to improve their burning properties.

12. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorpo-

rating in the leaves a tobacco extract to improve their flavor and calcium acetate to improve their burning properties.

13. The method of treating tobacco leaves which comprises removing undesirable natural substances from the leaves without destroying the leaf structures, and subsequently incorporating in the leaves a tobacco extract to improve their flavor and potassium carbonate to improve their burning properties.

14. The method of treating tobacco leaves to extract undesirable natural substances which comprises immersing the leaves in a dilute solution of nitric acid at a temperature of about 155 to 185° F. for a period of about 3 to 10 minutes.

15. The method of treating tobacco leaves to extract undesirable natural substances which comprises immersing the leaves in a solution containing about 5 to 7 percent nitric acid at a temperature of about 155 to 185° F. for a period of about 3 to 10 minutes.

16. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkali metal salt of an organic acid, an alkali metal nitrate, an alkali metal carbonate and an alkaline earth metal salt of an organic acid to impart burning properties and a tobacco extract to impart flavoring properties.

17. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkali metal acetate, an alkali metal nitrate, an alkali metal carbonate and an alkaline earth metal acetate to impart burning properties of the leaves and a tobacco extract to impart flavoring properties.

18. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkali metal salt of an organic acid to impart burning properties and a tobacco extract to impart flavoring properties.

19. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkaline earth metal salt of an organic acid to impart burning properties and a tobacco extract to impart flavoring properties.

20. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkali metal acetate to impart burning properties and a tobacco extract to impart flavoring properties.

21. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkaline earth metal acetate to impart burning properties and a tobacco extract to impart flavoring properties.

22. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with an alkali metal carbonate to impart burning properties and a tobacco extract to impart flavoring properties.

23. A tobacco leaf from which undesirable natural substances have been removed without destroying the leaf structure and which is impregnated with a tobacco extract to impart flavoring properties and potassium acetate to impart burning properties.

24. A tobacco leaf from which undesirable

natural substances have been removed without destroying the leaf structure and which is impregnated with a tobacco extract to impart flavoring properties and calcium acetate to impart burning properties.

- 5 25. A tobacco leaf from which undesirable

natural substances have been removed without destroying the leaf structure and which is impregnated with a tobacco extract to impart flavoring properties and potassium carbonate to impart burning properties.

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