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[54] **TOBACCO COMPOSITION AND METHOD OF INFLUENCING TOBACCO SMOKE AROMA**
3 Claims, No Drawings

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[50] **Field of Search** 252/522;
260/666; 99/140; 131/17, 9, 140—144

[56] **References Cited**

UNITED STATES PATENTS

3,246,036 4/1966 Winstrom et al. 260/586

OTHER REFERENCES

"Hach's Chemical Dictionary Fourth Edition" (1969) pub. by McGraw-Hill Book Co. N.Y. p. 194 cited

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ABSTRACT: A tobacco product is treated with a flavoring quantity of a biphenyl or cyclohexyl-cyclohexane compound. The specific effective compounds found suitable for the desired purpose are dodecahydrobiphenyl and 1-methyl-3-cyclohexyl-cyclohexane.

TOBACCO COMPOSITION AND METHOD OF INFLUENCING TOBACCO SMOKE AROMA

The present invention relates to the treatment of tobacco and more particularly to the improvement of the smoke qualities of tobacco-containing goods, tobacco foil and other products to be smoked, that is to say burnt and inhaled, for example in the form of cigarettes.

More particularly the present invention relates to methods of influencing the flavor of tobacco or tobacco products by the addition of materials which aromatize the smoke, endowing it, for example with a tangy-dry character so as to emphasize the natural aroma content of the tobacco during smoking.

One object of the invention is therefore the provision of a method of treating tobacco so as to provide a general emphasizing of the tobacco smoke aroma.

Methods are already known relating to the aromaticizing of tobacco. Thus, for example the U.S. Pat. specifications, Nos. 2,766,145—6C7 describe a method in accordance with which tobacco is treated with low-molecular weight organic acids which are found themselves, or in the forms of their derivatives, to improve the enjoyment of tobacco smoke. The materials added to the tobacco in accordance with this previous proposal are intended to dominate the flavor of the tobacco smoke.

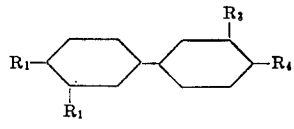
However, a general reinforcement or emphasizing in accordance with the object of the present invention is not possible with this previous proposal.

In accordance with a further proposal tobacco was to be impregnated with menthol, its derivatives or masked menthol. In suitable amounts the menthol passing into the various smoke streams or currents during smoking provides a generally fresh flavor in the smoke, but, however, there is no general heightening of the flavor of the impregnated tobacco. Furthermore, menthol, even when added in small amounts, does not harmonize with the various elements responsible for the flavor of tobacco so that many smokers reject it as being an adulteration.

In accordance with a still further prior proposal (see U.S. Pat. specification No. 3,334,637), tobacco goods were to be treated in small quantities with chemical substances which were to endow the tobacco with certain elements of flavor. Thus tobacco was, for example, to be impregnated with 1-methyl-2-formyl-pyrrol in order to improve the aroma. In accordance with a further known method (U.S. Pat. specification No. 3,211,157) the tobacco had 4-(2-butenylidene)-3, 5, 5 trimethyl-2-cyclohexene-1-one added to it in order to improve the flavor. Finally, in order to provide a cherry flavor, tobacco had 2-methyl-5-acetyl-pyrrol added to it.

All these methods are, however, not satisfactory because they either add a flavoring element which is foreign to tobacco, for example cherry flavor, or are so weak in their effect and expensive to provide that the treatment of tobacco with them, for example with 4-(2-butenylidene)-3, 5, 5-trimethyl-2-cyclohexene-1-one bears no proper relation to the improvement in the tobacco obtained.

The principal object of the invention, that is to say the general heightening of tobacco, more particularly cigarette tobacco, is achieved in that the flavor of a tobaccolike product is improved by adding to it at least one material of the general formula



in which R_1, R_2, $R_3$and R_4, which can be the same or different, denote —H or —CH_3. Such substances are found to provide with the tobacco with quite unexpected flavor characteristics. By "tobacco products" we mean tobacco or another substance for burning and inhaling for enjoyment by humans.

The substances, which can be added, by themselves have a fruity smell but when smoked into tobacco smoke heighten the general flavor of the tobacco and tend to provide a pine flavor which harmonizes well with the other elements in the tobacco flavor.

In conjunction with conventional tobacco aromaticizing agents such as etheral oils and the like such materials to be added in accordance with the invention tend to balance and round off the tobacco flavor while generally emphasizing the aroma so that their use in admixture with conventional flavoring material used in the tobacco industry brings about a substantial improvement.

Examples of compounds which can be used in accordance with the invention include dodecahydrobiphenyl and 1-methyl-3-cyclohexyl-cyclohexane.

Dodecahydrobiphenyl has the following characteristics:

Formula $C_{12}H_{22}$
Bp: 234°—236° C.
UV: 210 nm.
IR: 2,910, 1,440, 1,350, 1,260, 885, 835 cm.[11]
MW: 166/82, 55, 83, 67, 41

1-methyl-3-cyclohexyl-cyclohexane is an example of a methyl derivative of dodecahydrobiphenyl. The former compound can be produced by the hydrogenation of 2-methyl-4-cyclohexyl-phenol by active nickel in methane at 150° to 180° C. under pressure (F. Boettcher, Diss. Berlin 1930). Alternatively the compound can be produced via 1-methyl-3-phenyl-cyclohexene-6-one-5by hydrogenation on nickel in methyl-cyclohexane at 225° to 245° C. and 50 atm. (Petrow, Anzus, B. 66 1933, pages 420 to 422).

The materials to be used in accordance with the invention can be added to the tobacco in any suitable manner, for example by dipping the tobacco in solutions of the materials or by spraying it at any suitable juncture during the course of manufacture, for example during the production of cigarettes. It is irrelevant as regards the effect on the tobacco smoke flavor whether the whole of the tobacco mixture used for a tobacco article, such as a cigarette, is treated or only part of it. If the alteration in the flavor of the tobacco smoke by one or more materials in accordance with the invention corresponds with tobaccos normally added added in order to improve the flavor, such specially added tobaccos can be decreased in quantity or omitted all together. Since such flavoring tobaccos are usually expensive, the invention can thus provide for a decrease in cost.

EXAMPLE 1.

In order to judge the effect on the flavor of tobacco smoke by materials added in accordance with the invention, the tobacco mixture for commercially available cigarettes, which was completely free of artificial flavoring substances such as etheral oils, was treated with a 3 percent ethanolic solution of materials to be added in accordance with the invention and stored exposed to the air for 48 hours at b **20°** C. and 67 percent relative humidity and then made into cigarettes. The cigarette was smoked by a panel of experts and examined as regards the change in flavor.

The quantity of solution of materials in accordance with the invention applied to tobacco mixture was so chosen that the cigarettes of treated tobacco contained 0.001 percent (or 0.01 percent in the main smoke current with respect to the tobacco smoke condensate) of materials to be added in accordance with the invention. The amount of solution of material in accordance with the invention was empirically determined. Cigarettes with different proportions of the materials to be added accordance with the invention were smoked in accordance with the standards of the "Verband der Zigarettenindustrie" (Beitrage zur Tabakforschung 1, page 32 (1961), page 307 (1962) according to DIN draft standard 10.240) and the main smoke current was analyzed.

Cigarettes treated with dodecahydrobiphenyl were considered, when compared with untreated control cigarettes, to have a pleasantly heightened flavor. It was considered that the

cigarettes were mild and harmonious in flavor with a slightly peppery background.

EXAMPLE 2:

1-methyl-3-cyclohexyl-cyclohexane was applied in a similar manner to tobacco which was made into cigarettes. The cigarettes so treated were considered, when compared with control cigarettes, to have a flavor similar to that of those in the previous example. Apart from the general heightening of the aroma, the experts considered that the material endowed the tobacco smoke with a fruity resinlike character reminiscent of pine odor.

The quantity of the material added to the tobacco in accordance with the invention can be between 0.001 percent and 1.0 percent by weight, preferably 0.01 and 0.1 percent by weight.

What we claim is:

1. A method of influencing the flavor of a tobacco product which involves treating the said product with a small amount of an additive selected from the group consisting of dodecahydrobiphenyl and 1-methyl-3-cyclohexyl-cyclohexane, the amount of said additive being sufficient to effect a change in the tobacco smoke aroma.

2. A tobacco product containing a small amount of a flavoring additive selected from the group consisting of dodecahydrobiphenyl and 1-methyl-3-cyclohexyl-cyclohexane, the amount of said additive being sufficient to effect a flavor change in the tobacco when smoked.

3. The tobacco product of claim 2 wherein the flavor additive constitutes between 0.001 to 1.0 percent by weight of the tobacco.