United States Patent

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[54] **TOBACCO SHEET MATERIAL HAVING A HYDROPHOBIC COATING**
8 Claims, No Drawings

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[50] **Field of Search** ..... 131/15, 17, 140–144; 117/166 (Cursory)

[56] **References Cited**

UNITED STATES PATENTS

1,848,686	3/1932	Arnold	131/15UX
1,892,576	12/1932	Johnston	131/15X
3,185,162	5/1965	Fiore et al.	131/140

OTHER REFERENCES

Hercules (publication) "Nitrocellulose" Chemical & Physical Properties (1963) pub. by Hercules Powder Co., pp 10–14 inc. cited.

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ABSTRACT: Reconstituted tobacco material is provided with a hydrophobic coating of high viscosity nitrocellulose which is dissolved in an alcohol and either acetate or ketone solvent solution. The resultant hydrophobic coated sheet is particularly adaptable for use as cigar wrapping material.

TOBACCO SHEET MATERIAL HAVING A HYDROPHOBIC COATING

The present invention relates to the manufacture of reconstituted tobacco sheet material and, in particular, to such material coated with a hydrophobic material to render the same waterproof.

In U.S. Pat. Nos. 3,185,161 and 3,185,162, there is disclosed the method of coating reconstituted tobacco sheet with a water insoluble coating of ethylcellulose. Such coating has been found to be highly successful and has had great commercial success. However, it has been found that ethylcellulose coatings have certain minor drawbacks which, while not critical, cause a certain degree of discomfort to the manufacture of products using the same and to the smoker consuming such products.

For example, cigars made with a wrapper sheet coated with ethylcellulose tend to stick to cellophane outer wrappers. Products such as cigars employing wrappers with ethylcellulose coatings tend to burn unevenly, the coating film burning at a distinctly different and visible rate than the tobacco sheet itself. Further, ethylcellulose coatings have an aroma which is not typical of tobacco and therefore is sometime offensive to the smoker.

The present invention has as its object the provision of a coating material for use on reconstituted sheet tobacco which eliminates the above noted drawbacks while maintaining each of the objects, advantages, etc. set forth in the aforementioned patents for a coating material.

The present invention has as another object the provision of smoking products which are superior to those presently known.

These and other objects will, of course, be readily observed from the description and from the state of the art as exemplified by the aforementioned patents. It is not felt necessary to elaborate on the purposes of this invention since its need is well felt in the art.

It had at one time been anticipated that the ethylcellulose substances described in the aforementioned patents could be substituted for by other cellulose substances, for example, nitrocellulose. It was accordingly attempted to reproduce the results of the aforementioned patents with the use of ordinary nitrocellulose types (*e.g.*,nitrocellulose 200 sec (viscosity), low medium or high nitrogen types) with ordinary alcohol or aqueous emulsion, as described by the patent. All such attempts failed to produce even those results set forth in the aforementioned patents. Higher viscosities of nitrocellulose compounds were also assayed but to no avail.

We have found however, unexpectedly, and unobviously, in view of the above experiments, that when a particular high viscosity grade of nitrocellulose is dissolved in a particular solvent employing an acetate or ketone constituent in addition to the alcohol, superior products in accord with the stated objectives have been obtained.

We have found that nitrocellulose material of the type commercially sold by the Hercules Powder Company having a grade RS 2500—5000 sec. is satisfactory. Similar grades of nitrocellulose are of course available from other manufacturers and are equally as satisfactory.

For the purpose of this disclosure, viscosity was determined in accordance with ASTM D. 301—56 and D. 343—56 by dropping 3/32- inch steel balls, weighing between .0540-—.0560 gram, through a 2-inch column of a solution, held at 25°C., of 12.2 percent by weight of nitrocellulose in a solvent of 25 parts ethanol, 55 parts toleune and 20 parts ethylacetate. The time required for the ball to fall the 2 inches is recorded as the viscosity of the solution. The prefix RS refers to the percentage of nitrogen as being between 11.8—12.2. The class of ketones employed as the solvent constitutent include, for example, acetone, methylpropyl ketone, ethyl ketone, methylisobutyl ketone, etc. The class of acetates employed as the solvent constituent include, for example, isobutylacetate, methylacetate, n-propylacetate, n-butylacetate. Additionally, the preferred acetones and ketones are given in the following examples.

Accordingly, we have formulated for illustration the following coating solutions:

EXAMPLE I

Ingredient:	Actual Weight
Nitrocellulose RS 4000	2. 143
Acetone	49. 000
Isopropyl Alcohol	48. 857

EXAMPLE II

Ingredient:	Actual Weight
Nitrocellulose RS 2500	2. 143
Methylethyl Ketone	49. 000
Isopropyl Alcohol	48. 857

EXAMPLE III

Ingredient:	Actual Weight
Nitrocellulose RS 5000	2. 143
Methyl Isobutyl Ketone	49. 000
"Filmex" (Formula C)	48. 857

EXAMPLE IV

Ingredient:	Actual Weight
Nitrocellulose RS 4000	2. 143
Isopropyl Acetate	25. 000
Methyl Alcohol	72. 857

EXAMPLE VI

Ingredient:	Actual Weight
Nitrocellulose RS 5000	2. 143
Ethyl Acetate	25. 000
"Filmex"	72. 857

The weights of materials in each of the examples have been maintained the same so as to avoid extraneous factors. They are not critical and variations may be made when differing materials are employed dependent upon the resultant coating desired.

In each example the nitrocellulose employed was standard grade supplied commercially by Hercules Powder Company in a 70 percent solid 30 percent isopropyl alcohol mixture. The ketone or acetate used was technical grade or better in purity. The alcohol was at least 99 percent pure. "Filmex" is a denatured alcohol supplied by the Commercial Solvent Corp., with the following formulation: 100 gal. S.D.A/3A ethyl alcohol (composition:—to every 100 gals. alcohol add 5 gals. methyl alcohol), 1 gal. methyl isobutyl ketone and 4.25 gallons ethylacetate.

The examples given are illustrative of the variety of materials employed and the ranges of viscosity of nitrocellulose. It is believed unnecessary to give additional examples to show the effectiveness and operativeness of the invention within the scope of the defined limits and materials.

It has been found that certain solvents have a temporary residual odor which might require additional drying time or time to vaporize. Such time is of course readily available since the material is not put directly into use since the actual manufacture of smoking products is a long and time consuming process.

We have found that the best of results was obtained with the coatings of Example I and IV and accordingly they are preferred.

Each of the above formulations were either spray or roll coated upon a tobacco sheet material representative of the typical commercial sheet now available. As an example only, the following method was employed:

0.5 part locust bean gum is added slowly, with agitation, to a 2.5 percent suspension of 1 part of highly refined sulfite pulp

in water and agitation is continued until solution is complete. To the resulting dispersion is added, with stirring, 0.75 part diethylene gylcol humectant, 0.5 part dialdehyde starch wet strength agent (as a 10percent solution), 0.7 part diatomaceous earth and 6 parts tobacco dust (screen through -140 mesh) which has been prewetted with water (1 part tobacco to 2 parts water). Finally, 0.5 part ethyl hydroxyethyl cellulose adhesive are blended in carefully and the total solids adjusted to 10percent. The resulting dispersion is cast on a moving stainless steel belt. The sheet on the belt is dried and then coated with a solution of nitrocellulose and the coating dried. A thin flexible hydrophobic surface coating was deposited at coating levels of 30 mg./sq. ft., 50 mg./sq. ft. and 70 mg./sq. ft. by both the spray and roller methods of application.

The resultant coated tobacco sheet was evaluated by the usual method of testing and by use of the tobacco sheet as cigar wrapping material. Finished cigars were made; some of which were stored to determine effect of the coating after storage and upon the outer wrapping material, some of the cigars were smoked. All of the products exhibited superior qualities of burn, aroma and taste. Puckering, under changes of humidity, were absent as was stickiness and/or adhesion to cellophane.

It will thus be seen that we have provided a product satisfying each of the objectives set forth. It will be obvious that certain modifications may be made, for example, in the quantity

and nature of the nitrocellulose employed and in the ketone or acetate constituents used. Accordingly, it is intended therefore that the foregoing is by way of illustration only and that the present invention is limited only by the scope of the claims attached.

I claim:

1. The combination of reconstituted tobacco material and a hydrophobic coating therefor, said coating comprising a solution of high nitrocellulose having a viscosity range between 2500 to 5000 seconds, alcohol and a constituent selected from the group consisting of ketones and acetates.

2. The composition according to claim 1 wherein the ketone is acetone.

3. The composition according to claim 1 wherein the acetate is ethylacetate.

4. The composition according to claim 1 wherein the nitrocellulose has a viscosity of 4000 sec.

5. A smoking product such as a cigar in which at least a portion of the tobacco thereof is coated in accordance with claim 1.

6. The composition according to claim 1 wherein the class of ketones include acetone, methylpropyl ketone, dibutyl ketone and methy-isobutyl ketones.

7. The composition according to claim 1 wherein the class of acetates include ethylacetate, methylacetate, n-propyl acetate and n-butylacetate.

8. The composition according to claim 1 wherein the nitrocellulose is about 2 percent by weight of solution.