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MANUFACTURE OF SMOKING PRODUCTS

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This invention relates to the manufacture of tobacco sheet material. More particularly, the invention concerns a tobacco sheet made substantially entirely from tobacco material of which a major proportion is dry ground.

Tobacco sheet has heretofore been made by combining tobacco dust with a minor amount of film forming adhesive material such as polysaccharide emulsions. The use of dry ground rather than wet colloid milled tobacco has been recognized in this work as the basis for a sheet of superior burn aroma.

Prior to the development of tobacco sheet based on dry ground tobacco dust suspended in a polysaccharide adhesive matrix, work was done both on the manufacture of paper from tobacco and on the formation of sheets from wet milled tobacco particles.

Both of the latter types of sheet were made almost entirely from tobacco but lacked the burn aroma of a sheet made from a preponderant amount of dry ground tobacco. The burn odor of the polysaccharide bound sheets was influenced by the odor of burning adhesive. No tobacco sheet has heretofore been described which combines the virtue of dry ground tobacco with freedom from adhesive burn aroma.

Therefore, it is an object of this invention to provide a tobacco sheet material which includes a preponderant proportion of dry ground tobacco and is made substantially entirely from tobacco.

Another object of the invention is to provide a method of making tobacco sheet material which includes a preponderant proportion of dry ground tobacco and is made substantially entirely from tobacco.

These and other objects of the invention are more fully set forth in the following detailed description of the invention.

It has been found that tobacco contains within the plant tissue a substantial amount of adhesive material which can be used to bind together particles of dry ground tobacco dust. Much of this adhesive material includes polysaccharides of the hemicellulose or polyuronide groups and in the latter case largely pectins and related compounds which can be insolubilized by calcium ions. These materials can be released from the plant tissue by suitable chemical and physical treatment and combined with dry dust to form a sheet.

Tobacco material is steeped in water and cooked, preferably under pressure. The cooked material is treated in a beater with enough alkali to break down plant tissue and release adhesive constituents. A viscous pulp is formed which is then acidified and combined with a large amount of tobacco dust.

The mixture of pulp and dust is then formed into sheets on a sheeting machine such as a metal plate, band, or fine screen. All of these types of machine have been described in the tobacco sheet art.

Novel features of this invention include the treatment of stem fiber with caustic together with subsequent neutralization by acid to form a salt found naturally in tobacco which, moreover, aids in burn control of the sheet, such as saltpeter.

Another feature of the invention is the use of a major proportion of dry ground tobacco with a minor amount of stems from which a natural adhesive is extracted.

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The stems are macerated and the fibers are very finely chopped compared with paper-making methods.

A cross-linking agent such as a dialdehyde like glyoxal or calcium salts is added to the pulp slurry to give wet strength to the sheet by reaction with tobacco polysaccharides according to a preferred form of the invention.

The following example and recipe illustrates a preferred embodiment of this invention. While all of the adhesive chemicals used are derived from tobacco, the use of small amounts of non-adhesive ingredients such as humectants, waterproofing cross-linking agents and salts found in natural tobacco will greatly improve the utility of the final product as smoking material filler in pipes, cigars and cigarettes.

Example

Twelve grams of cigar stems (approximately 10 grams ash-free dry weight) and 100 to 250 ml., preferably 200 ml., of water are placed in an 800 ml. beaker, covered with a watch glass and placed in an autoclave or pressure cooker. Other containers may be used. The cover serves to reduce somewhat the loss of water from the beaker during the cooking. The loss may just as well be made up later. The autoclave is heated, for example, to about 15 p.s.i.g. which corresponds to a temperature of about 120° C. and held there for 10 to 20 minutes, preferably 10 minutes. The swollen and softened stems are cooled to 20° to 40° C. and beaten 10 to 30 minutes, preferably 15 minutes, in a high speed blender.

Stronger sheets result when the temperature is not allowed to go too high, 80° to 90° C., during the beating operation when the pulp is being intimately mixed with air. This is probably even more important after the alkaline autoclaving.

Any water losses which may have occurred during the first autoclaving or the beating are made up and 0.75 gram of potassium hydroxide (85% assay) is mixed in thoroughly. The mixture is autoclaved 2 to 18 hours, preferably 4 hours, at 15 p.s.i.g. and cooled. The pulp is beaten about 30 minutes or somewhat less in a blender.

The pulp is next adjusted to pH 4.3 with dilute nitric acid (1 vol. 70% nitric acid to 1 vol. water) and preferably 0.6 gram of 95% glycerin and preferably 2.5 grams of 30% glyoxal are added and mixed in thoroughly. Glycerin and glyoxal in very small amounts improved the sheet but may be omitted. Other humectants such as diethylene glycol or polyaldehyde cross-linking agents may be substituted. The pulp is finally adjusted to pH 2.6-2.8 with dilute nitric acid. It would also be satisfactory first to adjust the pH to 2.6-2.8 and then add the glycerin and glyoxal.

Finally 28.5 grams of -80 U.S. standard mesh Connecticut Broadleaf tobacco dust (-50 mesh is not as satisfactory) and sufficient water, about 150 ml., to give a consistency similar to that of catsup are added. The slurry is now ready to be cast in a sheet. The dry sheet thus produced will have the following approximate composition:

	Percent
Tobacco powder (assume 8% moisture)	66.2
Tobacco stem (assume 8% moisture)	27.4
Glycerin	1.5
Glyoxal	1.9
KNO ₃ (KOH+HNO ₃)	3.0
Total	100.0

In regard to the steam pressures and temperatures recommended, care must be taken to insure uniform heating of the batch of stems.

Some bright tobacco stems require 2.0 grams of KOH per 12 grams of stem to give a pH of 8.0 to 9.0 after the

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final beating. This is almost three times the amount of alkali usually required. Other samples of burley, bright and cigar tobaccos work satisfactorily with 0.75 gram of KOH per 12 grams of stems. A titration method can be used to determine the amount of alkali required by any batch of stems.

There has been described a new tobacco composition of dry ground tobacco (preferably in major proportion by weight) in combination with alkali extracted tobacco pulp and very small amounts of humectant and salt. This material is formed into sheets which are shredded to provide filler for smoking articles.

What is claimed is:

1. The method of making tobacco sheet which comprises cooking a mixture of tobacco in water, adding potassium hydroxide to the cooked tobacco mixture and further cooking same, acidifying the cooked tobacco mixture with nitric acid to form potassium nitrate therein, adding dry ground tobacco dust to form a slurry, forming said slurry into a sheet and drying said sheet, whereby the potassium nitrate formed in the product improves the burn characteristics of the finished sheet.

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2. The method of making tobacco sheet comprising digesting tobacco stems in an aqueous alkaline fluid to form a pulp, comminuting said pulp, neutralizing said pulp while preserving all tobacco substances thereof in situ, combining said neutralized stem pulp and tobacco substances with a preponderance of finely divided dry ground tobacco and a cross-linking agent to form a viscous slurry and forming said slurry into a sheet.

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