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MANUFACTURE OF TOBACCO

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This invention relates to the manufacture of tobacco compositions from tobacco dust. More particularly the invention relates to preventing dust loss from tobacco compositions.

One of the more serious problems in the processing of tobacco for use in cigarette, cigars and pipe tobacco manufacture, is the formation of fines or dust during the many handling stages. The sorting, blending, and shredding operations normally encountered in commercial operations, frequently give rise to numerous small particles which are not useful in the finished products. The amount of fines and dust lost in a large manufacturing operation can account for a sizeable percentage of the total tobacco handled.

In order to utilize these fines several processes have been developed for the conversion of the particles to manufactured sheets. The sheet-making processes are designed to convert these small particles into a continuous homogeneous sheet. The sheet may be formed from the fines and dust alone or together with other components of the leaf such as the stems, stalks, and leaf structure. The processes for converting fines and other portions of the tobacco plant to sheet may involve any of a number of operations such as digesting the particles and beating them to a thick viscous pulpy mass. This mass may be formed into a paper-like product by machinery well known in the paper industry.

Alternatively the pulpy mass of wet beaten tobacco may be treated with an adhesive and formed into a film on a non-porous surface such as a stainless steel belt. Similarly the tobacco may also be brought into the form of a thick viscous paste and said paste formed into a film or sheet by compressing it between rolls which may or may not be heated. By suitable applicator and drying processes, sheets or shreds, either continuous or discontinuous, of high tobacco content may be formed. These tobacco films may then be blended and shredded with untreated tobacco and rolled into cigarettes.

Another alternative process for utilizing the losses of commercial tobacco handling processes forms the ground dust into a sheet composed of two layers of dry dust separated by an adhesive layer. The adhesive layer may be composed of a pulpy mass obtained by refining stems in such a manner as to solubilize the natural gums and adhesives normally present in the tobacco stem. In this manner sheet of up to 100% tobacco content may be manufactured although it is sometimes advisable to use additives such as natural and synthetic gums, humectants and flavoring, ash control agents, and even dyestuffs to control the smoking, color, and burning characteristics of the product.

In all of the processes for converting scrap tobacco to a sheet form, there is a serious drawback. When the tobacco content of the sheet approaches 95% or more, the natural or synthetic adhesive is usually not capable of binding this high amount of tobacco into a continuous non-brittle film of natural smooth texture. Thus the sheets tend to lose dust and to contribute to the problem they were designed to overcome. Although much of the dust previously formed as a result of the numerous handling steps between the fields and the finished product remains in the sheet, the sheet still contributes dust. This dust may amount to up to 15% by weight of the finished

product. In a pack of cigarettes this is obvious from the loose ends and deposition of dust in the package. Although not as serious for cigars and pipe tobacco, the dust nevertheless is a noticeably undesirable characteristic here as well.

Therefore it is an object of this invention to provide tobacco composition from finely divided tobacco in which dust loss is improved and diminished.

It is also an object of this invention to provide a method of treating tobacco compositions, articles and products made from finely divided tobacco, whereby dustiness is controlled.

It has been found that the presence of dust in many smoking articles and particularly in various manufactured tobacco sheets, may be considerably diminished and practically eliminated by use of polysaccharides at critical steps in the processing. The practice of this invention can considerably diminish the necessity for using expensive dust recovery machinery and results in a saving both in the processing of tobacco and in the losses due to poor quality.

According to this invention aqueous polysaccharides are applied to the dusty exterior of tobacco products made from finely divided tobacco and the dustiness is controlled. For example, when tobacco products are formed on metal surfaces, these surfaces are coated with dilute polysaccharide solutions prior to contact with tobacco dust. When the formed tobacco composition is removed from the forming surface, the dust in combination with the tacky treating material remains adhered to the tobacco composition and does not shake off easily.

By the use of minimal amounts of these non-toxic, edible products which have been widely used in paste and other components in smoking articles, no significant changes in smoking quality result. Among the more useful compounds in this invention are methyl-cellulose, dextrins, pectin, alginates, corn and potato starch, guar and locust bean gums, gum karaya and tragacanth, various modified starches, amylose, and carboxymethylcellulose. In addition certain natural products containing a high carbohydrate content may also be used. Among these corn syrup, molasses, honey and apple syrup work with comparable result. These latter products may contribute some features to the flavor of the smoking product.

In general, most products having a degree of tackiness at the proper solids content will function. In some cases superior results are obtained if a humectant material is used in combination with the dust preventing carbohydrate.

Example I

In a preferred form of the invention, a solution composed of 5% by weight of British gum and 2.5% by weight of glycerine was coated onto a tobacco sheet made from finely divided tobacco. When the tobacco sheet was tested for dust loss it was found that the dust loss was reduced one third to one half by weight.

Example II

A blend of whole leaf cased Burley, Bright, Maryland, and Latakia tobaccos was prepared and shredded at about 14% moisture for conversion to cigarettes. Cigarettes were prepared in a cigarette maker operating at about 600 cigarettes per minute. From these cigarettes duplicate sets of 50 were randomly selected and cut open. The tobacco shreds were transferred to a 35 mesh U.S. standard sieve and the dust loss determined as in Example III (hereafter). It was found that an average of 5.6% dust was present. The moisture content was 12.8%.

A sample of the above blend before shredding was sprayed with the solution shown in the following table and again converted to cigarettes after being allowed to

come to equilibrium at 68% R.H. The dust loss is shown below:

Composition of spray:	Percent dust loss
0.1% methylcellulose (2% viscosity 15000 cps.)	1.5
2% guar gum	2.1
1% sodium alginate	3.2
5% glycerine	5.3
10% British gum plus 5% glycerine	2.1

It is apparent from these data that the use of the tacky polysaccharides improves the quality of the cigarette by diminishing the dust.

Example III

A tobacco sheet was prepared according to the processes described in U.S. Patents 2,734,510 and 2,734,513. This process was used with an adhesive composed of 1 part by weight of refined tobacco stems including solubles, 1 part by weight of locust bean gum and 0.2 part by weight of glycerine. The adhesive was applied at such a rate as to give a dry weight of 1.0 gram per square foot. Tobacco dust ground to pass a U.S. standard 50 mesh screen was used to form a sheet of final weight of 10 grams per square foot.

The dust lost from this sheet was determined in the following manner. Samples of approximately 30 grams were allowed to equilibrate at 70% relative humidity for about three hours. In the same humidity chamber the sample was carefully put through a rotary shredder which cut the sheet into shreds of approximately 2 millimeters width. The entire product was carefully brushed into a tared pan and weighed to the nearest 0.01 gram. The entire sample was then transferred to a 35 mesh U.S. standard sieve. The sieve was placed on a screen shaker device with a receiver pan and sieved for 5 minutes while the hammer tapped every second. The dust collected in the pan was weighed and the dust loss calculated. The moisture content of the sample was obtained from an adjacent sample. The following table summarizes the data obtained when various products were sprayed on the finished tobacco composition during the final rehumidification steps by spray means. Although it is difficult to determine exactly how much of the sprayed material actually is on the sheet because of overspray, studies of sheet weight increase have shown that this is usually of the order of 0.5–10% by weight.

Composition of Spray	Percent Dust Loss	Percent Moisture
Control: Water	6.13	14.02
Do: Water	9.63	12.6
10% Dextrin + 5% Glycerine	2.10	14.7
15% Honey	2.04	15.5
2% Carboxymethylcellulose	2.17	14.5
10% Dextrin + 5% Tetraethyleneglycol	3.21	14.4
25% Glycerine	3.15	
5% Dextrin	3.25	
10% Corn Syrup	1.10	15.3
10% British Gum	2.58	14.1
10% British Gum and 5% Glycerine	1.16	17.6
10% Pregelatinized Corn Starch	3.7	13.9

It is apparent from the above data that the invention improves the quality of the sheet by diminishing the dust loss from 5–10% down to 1–3%.

When cigarettes were made from a blend of domestic tobaccos to which 10% by weight of manufactured sheet was added, it was observed that the dust loss of the shreds was not significantly increased. In fact in some cases an actual decrease in dust loss was found. By contrast, identical cigarettes containing 10% of untreated sheet were found to have a higher dust loss than the natural shreds.

When high quality tobacco, which is too small in particle size for use in commercial cigarettes is converted to a continuous sheet by this process, the dust loss, as determined by the above described analytical procedure, averages about 5% after the sheet has been equilibrated to about 14% moisture on a wet basis.

Other humectant materials such as diethylene and propylene glycol, tri- and tetraethylene glycol, and 1,3 butylene glycol may also be used in place of the glycerine with similar results. In addition flavorings, preservatives, and coloring agents may be applied in combination with the dust preventing agent.

What is claimed is:

1. In the manufacture of tobacco sheet from finely divided tobacco and an adhesive, the step of controlling sheet surface dustiness arising in the manufacture of sheets containing a relatively high proportion of tobacco dust, which comprises applying to the surface thereof a tacky material in liquid condition selected from the group consisting of methyl cellulose, dextrins, pectins, alginates, starches, guar, locust bean gum, gum karaya, gum tragicanth, amylose, carboxymethylcellulose, honey, corn syrup, molasses and apple syrup in an amount sufficient to suppress dust loss.

2. In the manufacture of tobacco sheet and the control of surface dustiness arising in the manufacture of sheets containing a relatively high proportion of tobacco dust therein, the use of a surface coating of a tacky liquid preparation of a material selected from the group consisting of methyl cellulose, dextrins, pectins, alginates, starches, guar, locust bean gum, gum karoya, gum tragicanth, amylose, carboxymethylcellulose, honey, corn syrup, molasses and apple syrup, whereby dustiness is supressed.

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