

A B S T R A C T

A process of reconstituting tobacco is disclosed, in which, for the first time, the leaf part of the tobacco plant is used as a binding agent and "washing" is avoided in any part of the process, the latter being of importance in the drive against pollution of natural water resources. Tobacco shorts are added to water and cooked with mechanical agitation. The resultant mix is wet-ground. Stem material is disintegrated and wetted and the two liquid mixes are blended together and the resultant slurry is wet-ground and then cast and dried, re-humidified, cut to size and packaged in known manner. The process eliminates the need for expensive homogenization equipment and results in reconstituted sheets having good smoking qualities and very good equilibrium moisture content.

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This invention relates to a process for reconstituting tobacco, i.e. a process of manufacturing a coherent tobacco product adapted for smoking from leaf type and stem type tobacco materials normally rejected in the manufacture of cigarettes.

It has previously been proposed to make such a coherent tobacco product by preparing an aqueous binding agent from tobacco stems by subjecting the stems to aqueous extraction ("washing") to remove extractible components and effecting pressurization and intensive shearing homogenization of the residual stem material in the presence of water to yield a highly hydrated
10 pulp of cohesive properties, subsequently combining a quantity of dry-ground tobacco with said pulp and drying the combined pulp and dry-ground tobacco into coherent form. The "washing" step is undesirable from the point of view of water pollution and the homogenization step involves the use of expensive equipment.

It is an object of the present invention to provide a process which does not involve a washing step and which does not require the use of expensive homogenization equipment and yet which yields a product suitable for smoking.

According to the invention, there is provided a process of manufacturing a coherent tobacco product adapted for smoking, from leaf type and
20 stem type tobacco materials normally rejected in the manufacture of cigarettes, which process comprises cooking the tobacco leaf type material in water with mechanical agitation and wet grinding the resultant mix to form a binding agent, separately wet grinding stem type material, blending the wet ground leaf material and the wet ground stem material, wet grinding the blend and subsequently casting and drying it.

Preferably, the process includes the preliminary steps of reducing the size of the leaf material to a maximum of three-sixteenths of an inch in any dimension and reducing the size of the stem material to a maximum of one quarter of an inch in any dimension.

30 In a preferred embodiment of the invention, the leaf material is cooked in water at a temperature in the range of about 200°F - 210°F for a period of about 60 - 90 minutes and the stem material is wet ground in water

at a temperature in the range of about 60 - 100°F.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying flow sheet.

Tobacco shorts are fed from a feeder 10 to a dry milling machine 11 to reduce any large flakes of lamina to less than 3/16". The shorts are derived mostly from the non-leaf supporting parts of the tobacco plant rejected from the cigarette making and leaf processing factories. The major portion of the tobacco particles would be retained on a 60 mesh screen ASTM and preferably the major portion would be retained on a 35 mesh screen ASTM. The machine 10 11 may be a dry mill fitted with a 3/16" basket or screen.

From the dry mill the shorts proceed to a digester or cooker 12 and water is fed in at 14 at a temperature of from 170-210°F, preferably above 200°F, one pound of tobacco being fed in to ten pounds of water. The mixture in the cooker 12, which is an open vessel, is mechanically agitated and heat is added to maintain the temperature above 200°F. The cooking is carried out for a period of time of about one half to about three hours, preferably about 60 to 90 minutes.

The cooked mixture is wet ground at 13 in a wet grinder or Reitz machine or machines, starting with a screen of 0.016" opening and proceeding 20 to a final pass through 0.012" openings (60 conidure).

In parallel with the processing of the shorts, tobacco stem or vein type material about 1/8" to 1" long is fed from feeder 20 to a dry mill 21 with a 1/4" basket or screen to reduce the size of the material to a maximum of 1/4" long. From there the material proceeds to a wet mill or Reitz disintegrator 23 equipped with a 0.032" screen, to which water at 35-160°F, preferably about 60-100°F, is fed at 22. The mix from stage 23 is blended at 24 in a tank fitted with temperature and time controls. If the temperature in the tank is allowed to go too high the eventual sheet will be too dark and if the mix is held too long in the tank leaching will occur. The holding time at stage 24 30 may be from a few seconds to 45 minutes, preferably 10-15 minutes.

The wet ground shorts and the wet ground stems are blended together at 50 in a tank or, preferably, a pump where the two liquids are well mixed

with any of the desired additives 52 known in the tobacco art, e.g. humectants and plasticizers, such as glycerol, sorbitol, invert sugar and various other materials. The additives should usually not exceed 10% by weight and preferably not 7½%. The resulting mix is then wet ground at 51 in a wet mill or Reitz machine or machines so that the material receives at least one pass through a machine equipped with a 0.012" screen or smaller.

The material leaving stage 51 is then processed as in the prior art. Thus, it may be de-aired as at 52, cast and dried on a stainless steel band at 53, re-humidified and removed from the belt at 54 and cut to size and packed at 55.

A specific example of the process according to the present invention is set out below.

Example

220 pounds of stem type material was dry milled so that the average particle size was less than ¼" in the longest dimension.

285 pounds of tobacco shorts were dry milled so that the average particle size was less than 3/16". This material was then added to 250 gallons of 200° F water and cooked with agitation for 60 minutes. This material was then passed through one Reitz machine equipped with a 0.012" screen. Simultaneously the aforementioned stem material was fed at a constant rate with cold water at 8.5 gpm through three Reitz machines equipped with 0.032", .016" and .012" screens and mixed with the liquid binder from the lamina portion (shorts). The resultant combination was fed through two Reitz machines equipped with .006" screens. Thirty-eight pounds of glycerine was added during the processing. The resultant slurry was de-aired and cast on a band dryer and dried.

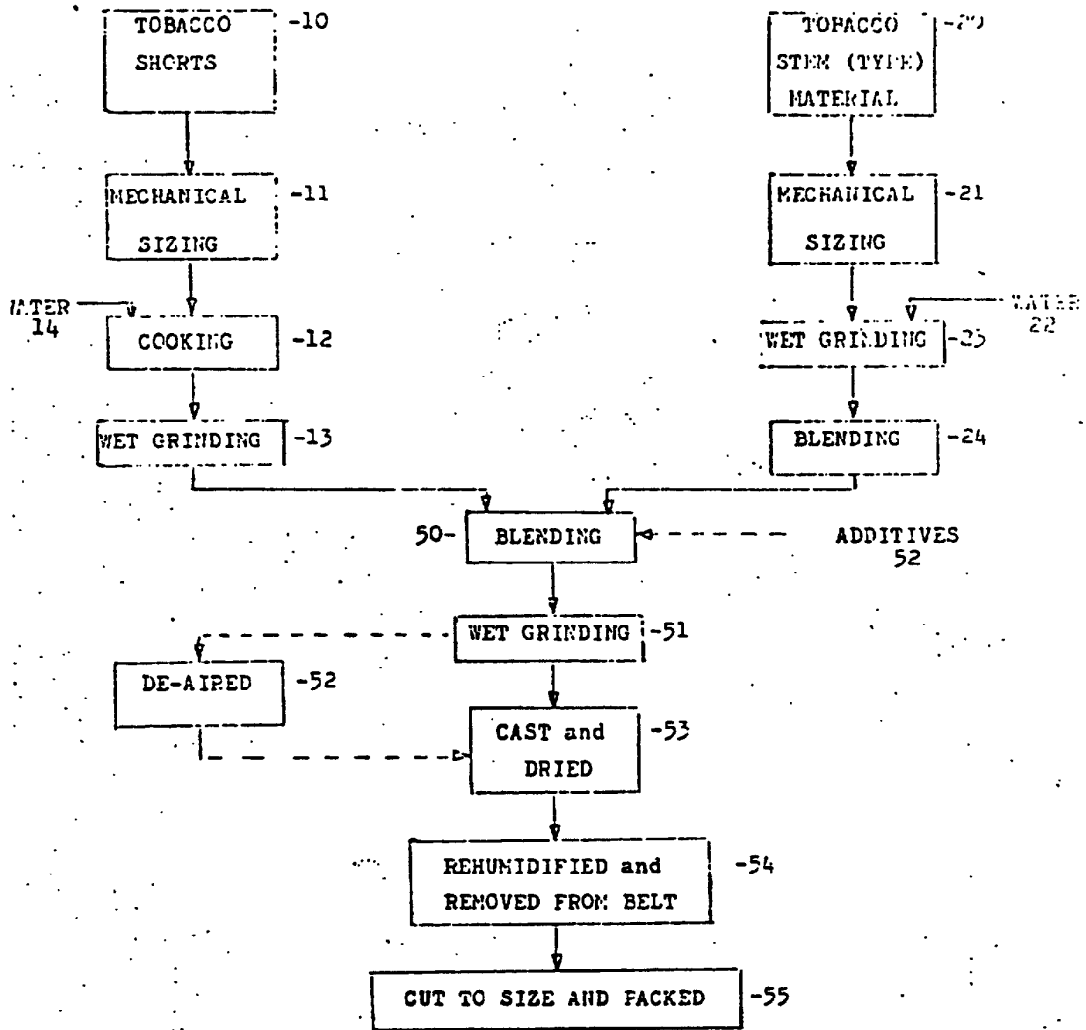
The reconstituted tobacco sheets produced by the process of the present invention smoke well and have a very good equilibrium moisture content compared with reconstituted sheets prepared by prior known processes. The latter can be attributed to the absence of the prior art washing step. Sheets made according to the above Example had, at 72° F, an equilibrium moisture content of 12.8 at 50% RH and 17.6 at 60% RH (relative humidity).

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. The process of manufacturing a coherent tobacco product adapted for smoking, from leaf type and stem type tobacco materials normally rejected in the manufacture of cigarettes, which process comprises cooking the tobacco leaf type material in water with mechanical agitation and wet grinding the resultant mix to form a binding agent, separately wet grinding stem type material, blending the wet ground leaf material and the wet ground stem material, wet grinding the blend and subsequently casting and drying it.
2. The process of claim 1, which includes the preliminary steps of reducing the size of the leaf material to a maximum of three-sixteenths of an inch in any dimension and reducing the size of the stem material to a maximum of one quarter of an inch in any dimension.
3. The process of claim 1, wherein the water in which the leaf material is cooked is maintained at a temperature in the range of 170° - 210°F and the cooking with mechanical agitation is carried out for a period of time of about one half to about three hours.
4. The process of claim 3, in which the temperature is maintained above 200°F and the time is about 60 to 90 minutes.
5. The process of claim 1, 2 or 3 wherein water which is used in wet grinding the stem material is at a temperature in the range of about 35 - 160°F.
6. The process of claim 1, 2 or 3, wherein water which is used in wet grinding the stem material is at a temperature in the range of about 60 - 100°F.
7. The process of claim 1, 2 or 3, in which the leaf material is cooked in water at a temperature in the range of about 200°F - 210°F for a period of about 60 - 90 minutes and the stem material is wet ground in water at a temperature in the range of about 60 - 100°F.

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RECONSTITUTED TOBACCO PROCESS



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