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TREATMENT OF TOBACCO

Geoffrey Norman Richards, Townsville University, Queensland, Australia, assignor to American Machine & Foundry Company, New York, N.Y.

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2 Claims. (Cl. 131—140)

This invention relates to the production of reconstituted tobacco sheet from tobacco stems.

Reconstituted tobacco sheet is normally made by cooking tobacco or tobacco stems with water at elevated temperature (usually above 135° C.), mechanically refining to a pulp, perhaps adding tobacco dust, and then casting to a sheet on a steel belt. The economic necessity to obtain a high yield normally excludes the possibility of washing out solubles from the pulp or sheet and the finished sheet product obtained by such a method is a very dark brown in colour. While this colour is not detrimental to use of the sheet as cigar binder, it precludes its use in cigarette filler.

We have concluded that at least part of the dark colour of the sheet results from complex reactions such as "sugar browning" during the stem cooking process. These reactions result, for example, from interaction of reducing sugars and amino acids, and are known to be highly dependent on temperature and pH. We have now found that the colour forming reactions can be suppressed to an adequate extent by adopting any one or more of the following procedures viz.

(1) The stem cooking temperature is reduced to 110 to 130° C. with sufficient increase in refining (i.e. beating) time to produce adequate pulp freeness.

(2) The time of cooking is reduced e.g. to less than 2 hours at 140° C. ranging to less than 4 hours at 130° C. again with longer refining period.

(3) A small amount of acetic acid is added to the cooking liquors, in which case the period of refining may be reduced in comparison with the same procedure but without acetic acid. The quantity of acetic acid is 1 to 10 percent (preferably 2 to 7 percent) based on tobacco solids.

Furthermore, we have found that the stem pectic acid (which is an important factor in sheet strength) is very much less degraded by cooking at these lower temperatures and that the use of acetic acid speeds up the subsequent refining of the stems and hence reduces the power requirements for this operation.

The advantages achieved by this invention are illustrated by the following examples:

Cooking stems

(1) 225 g. bright stems (moisture 11.1%) were cooked with 1650 ml. water at 15 p.s.i.g. (pounds per square inch) (121° C.) without stirring for 5 hours.

(2) Experiment 1 was repeated with 1650 ml. of 0.0885 N acetic acid in place of the water.

(3) Experiment 1 was repeated at 40 p.s.i.g. (141° C.) in a rotating autoclave for 5 hours.

Beating stems

In each case, after cooking, the stems and extracts were diluted to 3300 g. with water and beaten in a Medway beater after "slushing" for about 5 minutes. The changes in Canadian Standard Freeness with beating time for experiments 1 and 2 are shown in Table II. In experiment 3, the stems were so soft that beating to the increasing CSF stage occurred during slushing and the pulp was ultimately obtained at CSF 550. The beaten pulps from experiments 1 and 2 were much more viscous than those from

experiment 3. This effect is probably related to the degradation of pectic acid in the latter experiment (see Table I).

Casting sheets

A 100 g. sample of pulp from the beater was stirred with 12 g. air-dry tobacco leaf dust (—80 mesh fraction) and 20 ml. water, de-gassed at 30 mm. pressure for 10 minutes and cast on a Teflon-coated stainless steel plate with a knife or doctor blade providing a spreading gap of 0.05. The sheet was placed in a stream of air in an oven at 150° C. and removed just before drying was complete. In all cases the top surface of the sheet was much darker than the lower.

The sheet from experiment 3 was very dark in colour, that from experiment 1 was less dark, while the sheet from experiment 2 was by far the lightest in colour.

Pectic acid in the pulps

The pulps from experiments 1–3 were each centrifuged and samples of the clear brown centrifugates tested for dissolved pectic acid by addition of calcium chloride solution and hydrochloric acid. In no case was any gel precipitated, and it was concluded that no dissolved pectic acid was present in the pulps.

10 g. ammonium oxalate was then added to 500 g. samples of pulp from experiments 1 and 3, and boiled with stirring for 2 hours. The pulps were next centrifuged and the centrifugates stirred at room temperature while 10 ml. of concentrated hydrochloric acid was added. Experiment 1 yielded a gel precipitate at this stage while experiment 3 yielded a flocculent powder precipitate. The pectic acid products were washed with acetone and viscosities were determined. Results are tabulated in Table I and show that the pectic acid is not unduly degraded during 5 hours at 121° C. but is heavily degraded at 141° C.

TABLE I.—PROPERTIES OF PECTIC ACID FROM COOKED BRIGHT STEMS

Pretreatment (i.e. cooking)	Viscosity Number[1] (ml.-g.-1)	Form of Precipitated Pectic Acid
Water/20°/18 hrs.	200	Gel.
Water/121°/5 hrs.	117	Gel.
Water/141°/5 hrs.	31	Powder.

[1] Concentration 0.25% in 0.155 M. sodium chloride at pH 6.0.

TABLE II.—REFINING OF COOKED BRIGHT STEMS

Beating Time (min.)	Pulp Freeness (A)	(Canadian Standard) (B)
1.0	300	170
3.0	120	100
5.0	70	90
7.0	—	130
9.0	—	215
10.0	110	—
11.0	—	305
12.5	150	—
13.0	—	430
17.5	400	—

(A) Cooked in water at 121° for 5 hours.
(B) Cooked in 0.885 N acetic acid for 5 hours.
— Not determined.

These figures show that the use of acetic acid is also of great advantage in obtaining an adequate pulp freeness within a reasonable beating time.

What I claim is:

1. A method for the production of reconstituted tobacco sheet comprising the steps of cooking tobacco stems in water at a temperature between 120° C. and 140° C. for periods ranging from two hours at 140° C. to about five hours at 120° C. followed by diluting with water and slushing and then mechanically beating the resultant pulp

for about five minutes to produce a refined pulp having adequate freeness, and thereafter forming the pulp into a sheet.

2. A method for the production of reconstituted tobacco sheet comprising the steps of cooking tobacco stems in water containing 1 to 10% by weight of acetic acid based on tobacco solids at a temperature between 120° C. and 140° C. for periods ranging from two hours at 140° C. to five hours at 120° C., thereafter diluting with water and slushing and then mechanically beating the resultant pulp to produce a refined pulp having adequate freeness, and thereafter forming the pulp into a sheet.

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SAMUEL KOREN, *Primary Examiner.*

MELVIN D. REIN, *Examiner.*