

### Reconstituted Tobacco

The subject invention relates to the reconstitution of tobacco and to reconstituted tobacco.

Tobacco may be reconstituted by use of extrusion, band casting or paper making techniques. An extrusion process for the reconstitution of tobacco is disclosed in GB 2 201 081. In the process of GB 2 201 081 particulate tobacco, starch, a binder, water and glycerol are fed to a screw extruder. The extrudate, which is of web form, is cooled and is then shredded longitudinally and cut transversely, thus to produce a reconstituted tobacco product of elongate particles. When the particulate reconstituted tobacco is packed in bulk, for example for transport and storage, compression or compaction of the reconstituted tobacco usually occurs, thus there is a tendency for particles thereof to adhere one to another. Therefore, when the reconstituted tobacco is unpacked, it is commonly the case that a proportion thereof is agglomerated. Mechanical deagglomeration processes cause a proportion of the reconstituted tobacco the subject of such processes to disintegrate into dust.

Various methods for overcoming the aforementioned agglomeration of particulate reconstituted tobacco have been proposed, but none has proved to be wholly successful. For example, particulate reconstituted tobacco has been packed at a lower than conventional moisture content. However, difficulties arise in maintaining a low moisture content when warm and humid ambient conditions prevail. Further, the

particulate reconstituted tobacco is more susceptible to disintegration when it is maintained at a low moisture content.

It is an object of the subject invention to provide a fully effective means of obviating or substantially diminishing the agglomeration of particulate reconstituted tobacco.

The subject invention provides a tobacco industry procedure wherein particulate reconstituted tobacco, which reconstituted tobacco exhibits an inter-particulate adherence propensity, and a particulate anti-adherence agent are subjected to an intermixing process, a body of the intermixed anti-adherence agent and reconstituted tobacco particles is subjected to conditions which, absent the anti-adherence agent, would promote the occurrence of agglomeration of the reconstituted tobacco by inter-particle adherence thereof, and subsequent to the subjection of said body to said conditions said body is subjected to a separation process whereby the anti-adherence agent is separated from the reconstituted tobacco.

By preference, the anti-adherence agent is of dust-like constitution.

Advantageously, the anti-adherence agent comprises or consists of tobacco dust.

In carrying out a process as per that disclosed in GB 2 201 081 an initial step may be constituted by the grinding to fine particulate form of tobacco. In such case a fraction of the ground tobacco may advantageously be employed as the anti-

adherence agent of the subject invention. The fraction is by preference a fine size fraction, not exceeding  $100\mu\text{m}$  for example. Heretofore, it was a common practice to discard such fine size fraction as waste. Usually, the amount of dust produced by the grinding and sieving of tobacco for the extrusion process disclosed in GB 2,201,081 equals, if not exceeds, the amount of dust required as the anti-adherence agent for unit amount of reconstituted tobacco produced.

Other substances which, in particulate form, may be utilised as the anti-adherence agent or a proportion thereof are, for example, titanium dioxide, chalk, magnesium hydroxide, magnesium carbonate, magnesium sulphate and starch.

Two or more anti-adherence agent substances may be used in conjunction.

Preferably, the particulate anti-adherence agent is present in the body of the intermixed anti-adherence agent and reconstituted tobacco at a level up to about 20% wt/wt. More preferably, the anti-adherence agent is present at a level not exceeding about 15% wt/wt.

The anti-adherence agent or a proportion thereof can be a drying agent such, for example, as magnesium sulphate in anhydrous form or magnesium oxide.

Suitably, the anti-adherence agent is constituted by a substance(s) utilised in the reconstitution process.

The intermixing process is preferably effected directly after the reconstituted tobacco is rendered particulate. As will be appreciated by the person skilled in the art, it is important that the intermixing process takes place not later

than, or not substantially later than, the onset of agglomeration of the reconstituted tobacco.

The intermixing process may be conducted by use of a rotative mixing cylinder, in which cylinder the particulate reconstituted tobacco is intermixed by tumbling with the particulate anti-adherence agent(s).

An alternative intermixing means may be constituted by a pneumatic conveyance apparatus operable to pneumatically convey, in a stream of air for example, the particles of reconstituted tobacco. The apparatus comprises introduction means whereby the particles of the anti-adherence agent(s) may be introduced into the flow of the pneumatically conveyed reconstituted tobacco particles, thereby to be intermixed with the reconstituted tobacco particles.

The particulate anti-adherence agent(s) may be applied onto a moving carpet of the particulate reconstituted tobacco, such application being followed by, if necessary, an intermixing or further intermixing step.

As an aid to the obtainment of effective intermixing of the anti-adherence agent and the reconstituted tobacco, the particles of those respective materials may be electrostatically charged, the charge of the particles of one of the materials being opposite to that of the particles of the other material.

Because the degree of adherence between the anti-adherence agent and the reconstituted tobacco is no more than minimal, or by preference is zero or substantially zero, the degree of vigour of the separation process, effective to

separate at least the great majority, at least 80% say, of the particles of the anti-adherence agent from those of the reconstituted tobacco, can be considerably less than that degree of vigour which would cause degradation of the reconstituted tobacco. By contrast, should the degree of adherence between the anti-adherence agent and reconstituted tobacco particles be greater than minimal, as for example if an adhesive extrinsic to the body of the intermixed anti-adherence agent and reconstituted tobacco particles is present, the separation process would have to be of a degree of vigour such that unacceptable degradation of the reconstituted tobacco would ensue.

The separation process may be effected by use of, for example, a vibratory perforated conveyor, a sieve or an air separation system.

Rather than installing in the processing line an apparatus the installation of which therein is for the specific purpose of effecting the separation process, the separation process may be effected by apparatus specified for inclusion in the line for processing purposes of the line, but which apparatus at the same time serves to separate the particles of the anti-adherence agent from those of the reconstituted tobacco.

In a first example of carrying out the subject invention a particulate reconstituted tobacco was produced by an extrusion process as per GB 2 201 081. The particulate reconstituted tobacco was then intermixed with starch powder of a particle size less than 100 $\mu$ m, the weight of the starch

powder being equivalent to 10% of the weight of the reconstituted tobacco. After one month of storage of the intermixed reconstituted tobacco and starch powder it was found that only 0.6% of the reconstituted tobacco was agglomerated, as compared to a 15% level of agglomeration for a control body of the same particulate reconstituted tobacco which had been stored for one month without having been intermixed with an anti-adherence agent.

In a second example of carrying out the subject invention, after particulate reconstituted tobacco had been produced as per GB 2 201 081, the reconstituted tobacco was intermixed with 12% wt/wt tobacco dust as an anti-adherence agent, the dust being of a particle size of less than 100 $\mu$ m. In this case it was found that the level of agglomeration was decreased to one third of the level appertaining to a control body of the same reconstituted tobacco.

Ideally, agglomeration of the reconstituted tobacco is not greater than approximately 5% by weight, and more preferably is not greater than 2-3%, and even more preferably is 0%.

Experiments utilising a tobacco dust (12% wt/wt), being of a particle size of considerably greater than 100 $\mu$ m as an anti-adherence agent showed this fraction to be less effective in reducing agglomeration of a reconstituted tobacco as compared with tobacco dust being of a particle size of less than 100 $\mu$ m.

CLAIMS

1. A tobacco industry procedure wherein particulate reconstituted tobacco, which reconstituted tobacco exhibits an inter-particulate adherence propensity, and a particulate anti-adherence agent are subjected to an intermixing process, a body of the intermixed anti-adherence agent and reconstituted tobacco particles is subjected to conditions which, absent the anti-adherence agent, would promote the occurrence of agglomeration of the reconstituted tobacco by inter-particle adherence thereof, and subsequent to the subjection of said body to said conditions said body is subjected to a separation process whereby the anti-adherence agent is separated from the reconstituted tobacco.
2. A procedure according to Claim 1, wherein said anti-adherence agent is of a dust-like constitution.
3. A procedure according to Claim 1 or 2, wherein the particles of said anti-adherence agent do not exceed about 100 $\mu$ m.
4. A procedure according to any one of Claims 1 to 3, wherein said anti-adherence agent comprises tobacco.
5. A procedure according to any one of Claims 1-3, wherein said anti-adherence agent comprises a substance selected from the group consisting of titanium dioxide, chalk, magnesium hydroxide, magnesium carbonate, magnesium sulphate and starch.



6. A procedure according to any one of the preceding claims, wherein the anti-adherence agent is provided by more than one substance.
7. A procedure according to any one of the preceding claims, wherein said anti-adherence agent is provided by a substance(s) utilised in the reconstituted tobacco formulation.
8. A procedure according to any one of Claims 1 to 3, or to Claim 6 or 7 as appended to any one of Claims 1 to 3, wherein said anti-adherence agent comprises a drying agent.
9. A procedure according to any one of the preceding claims wherein said anti-adherence agent is present in said body at a level up to about 20% wt/wt.



PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(51) International Patent Classification <sup>6</sup>:</b><br><b>A24B 15/14, 15/28</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>A1</b> | <b>(11) International Publication Number:</b> <b>WO 97/22267</b><br><b>(43) International Publication Date:</b> 26 June 1997 (26.06.97)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>(21) International Application Number:</b> PCT/GB96/02933<br><b>(22) International Filing Date:</b> 29 November 1996 (29.11.96)<br><b>(30) Priority Data:</b><br>9525625.1 15 December 1995 (15.12.95) GB<br><b>(71) Applicant (for all designated States except US):</b> BRITISH-AMERICAN TOBACCO COMPANY LIMITED [GB/GB]; Millbank, Knowle Green, Staines, Middlesex TW18 1DY (GB).<br><b>(72) Inventor; and</b><br><b>(75) Inventor/Applicant (for US only):</b> PROWSE, Roy, Lester [GB/GB]; 83 Hocombe Road, Chandlers Ford, Eastleigh, Hampshire SO53 5QB (GB).<br><b>(74) Agents:</b> MACLEAN, Kenneth, John, Hamson et al.; British-American Tobacco Company Limited, Patents Dept., Technology Centre, Regents Park Road, Southampton SO15 8TL (GB).                                                                                          |           | <b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).<br><br><b>Published</b><br><i>With international search report.</i> |
| <b>(54) Title:</b> RECONSTITUTED TOBACCO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>(57) Abstract</b><br><br><p>A tobacco industry procedure wherein particulate reconstituted tobacco, exhibiting an inter-particulate adherence propensity, and a particulate anti-adherence agent are subjected to an intermixing process. A body of the intermixed anti-adherence agent and reconstituted tobacco particles is subjected to conditions which, absent the anti-adherence agent, would promote the occurrence of agglomeration of the reconstituted tobacco by inter-particle adherence thereof. The body of intermixed anti-adherence agent and reconstituted tobacco particles is then subjected to a separation process to separate the anti-adherence agent from the reconstituted tobacco. By use of this procedure the reconstituted tobacco can be stored under compacted conditions without the occurrence of agglomeration.</p> |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |