(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 530 501 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **92112993.8**

(51) Int. Cl.5: **B27N 1/02**

(22) Date of filing: **30.07.92**

(30) Priority: **05.09.91 SE 9102549**

(43) Date of publication of application:
10.03.93 Bulletin 93/10

(84) Designated Contracting States:
AT DE ES FR IT SE

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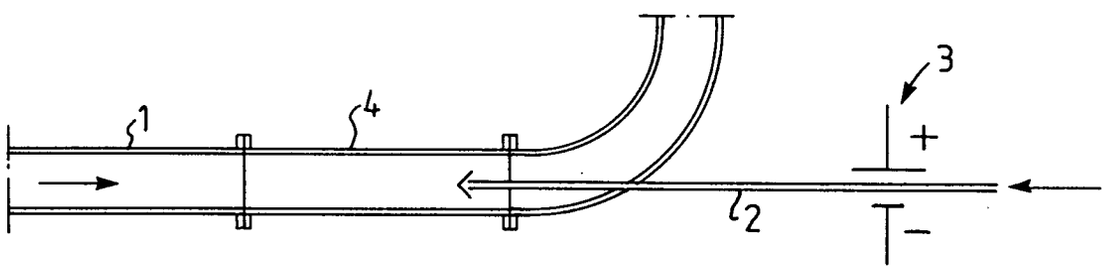
(54) Method and device for glue coating of particles.

(57) A method and a device for glue coating primarily cellulose-containing material, in connection with the manufacture of fiber board, particle board, dry-formed paper and the like. The glue is supplied through a supply line (2) to a flow of particles in a pipe (1). Prior to the mixing, a different electrostatic charge is applied in a controlled way on the glue and particles, so that a strong attractive force arises between glue and particles.



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This invention refers to a method and a device for the glue coating of particles, primarily of cellulose material such as fibres and chips, in connection with the manufacture of e.g. fiber board according to the dry method, so-called MDF (Medium Density Fiberboard), dry-formed paper and particle board.

The admixture of glue has the object to improve the bond between the particles in order to achieve a strong fibre, chip or paper product. The glue is of the heat-curing type. For fibre and chip products normally urea formaldehyde resin and phenol resin are used. For paper products other binding agents are used, for example latex.

At the manufacture of particle board, and in certain cases of MDF, so-called mechanical glue mixers are used at present. These mixers consist in principle of a trum comprising a rotor member. Particles and glue are supplied to the drum where the glue is sprayed in form of a suspension over the particles. For effecting a good distribution of the glue, the mixture of particles and glue is subjected to heavy stirring by the rotor.

At the manufacture of MDF, another method, so-called blow line glue coating, is applied for glue coating. The fibres are produced in a pulper, whereafter the fibres, together with the steam generated in the pulper and a small amount of water, are transported through a line to a drier. The speed in this blow line is 30-300 m/s. Due to the high turbulence in the blow line, the liquid glue injected into the blow line at high pressure is atomized and adheres to the fibres.

At these known methods, the use of mechanical glue mixers results in a glue consumption which is lower than at blow line glue coating. The disadvantage of mechanical glue mixers, however, is that it is not possible to distribute the glue uniformly on the fibres. On some fibres the amount of glue adhering thereon is so great, that lumps are formed. These lumps appear as dark-coloured spots on the finished product.

The present invention solves the aforesaid problem and offers additional advantages. The invention implies, that prior to their mixture a different electrostatic charge is applied to the glue and particles, so that a strong attractive force arises between the same. The characterizing features of the invention are defined in the attached claims.

The amount of particles normally being greater than the amount of glue, it is particularly suitable to apply a controlled and adjustable charge on the glue. The particles can be charged during their transport before the place of mixture.

The glue can be in liquid or powder state and be of the type stated above. The charging of the glue can be effected by means of an external current source or by friction charge. The latter can be used with powdered glue, and the glue is charged by friction against the transport line, which preferably is a plastic line. A suitable charge is 5000 - 100 000 V.

The method according to the invention, generally, yields a greater flexibility in choosing the place in the process where the glue coating can take place.

The admixture of liquid glue according to the invention, contrary to conventional blow line glue coating, renders it possible to add the glue in a position where the temperature is lower than in the blow line, whereby the glue is less cured and, consequently, the glue consumption is smaller.

The admixture of dry glue according to the invention implies, that the total energy consumption can be reduced because no energy need to be supplied for evaporating the water contained in the liquid glue. This is an advantage, in spite of the fact that the glue is more expensive because it may be necessary at the manufacture of the glue to dry the glue from e.g. 60% dry matter content to 90% dry matter content. A saving of energy of up to 10% compared with conventional blow line glue coating can be obtained. This corresponds also to a 10% reduction in the glue of the drier or to a 10% higher capacity of the drier installed.

The invention is described in greater detail in the following, with reference to an embodiment thereof shown in the accompanying drawing.

Particles in the form of fibres are transported through a pipe 1 at a flow rate of 25-40 m/s. The glue is supplied through a feed line 2 to the fibre material in the pipe 1 in such a way, that the glue meets the fibre flow. The desired charge is applied to the glue by means of an external controllable current source 3. The injection of the glue preferably takes place immediately before a bend of the pipe 1, in order to render possible a simple arrangement of the necessary equipment as shown in the Figure.

The charging of the glue, alternatively, can be effected by so-called friction charge. Such a charging can be brought about by air transport of the glue in a plastic line where the charging can be controlled by the flow rate and the line length.

The glue supply can be controlled in a conventional way.

It may be suitable to form portion 4 of the pipe 1,where the glue is injected, of an insulating material, such as plastic, porcelain, wood or the like whereby the charge of the glue and, respectively, particles is not conducted away.

The invention, of course, is not restricted to the embodiments set forth, but can be varied within the scope of the invention idea.

Claims

1. A method of glue coating particles, primarily of cellulose-containing material, in connection with the manufacture of fiber board, particle board, dry-formed paper and the like, comprising the supply of the glue directly into a flow of particles in a pipe, **characterized in** that prior to their mixture a different electrostatic charge is applied in a controlled way on the glue and particles, so that a strong attractive force arises between glue and particles.

2. A method as defined in claim 1, **characterized in** that an electrostatic charge is applied on the glue by means of an external current source.

3. A method as defined in claim 1, **characterized in** that an electrostatic charge is applied on the glue by means of friction in the supply line.

4. A method as defined in any one of the preceding claims, **characterized in** that the glue is supplied so that it meets the particle flow in the pipe.

5. A method as defined in any one of the preceding claims, **characterized in** that the electrostatic charge is 5000 - 100 000 V.

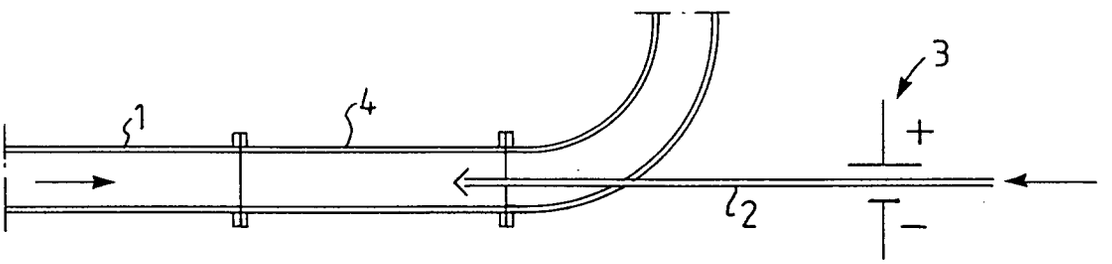
6. A method as defined in any one of the preceding claims, **characterized in** that the particle flow rate is 25-40 m/s.

7. A device for size coating particles, primarily of cellulose-containing material, in connection with the manufacture of fiber board, particle board, dry-formed paper and the like, comprising a pipe (1) for transporting the particles and a supply line (2) for the glue, **characterized in** that means are provided to apply an electrostatic charge on the glue which is different from the charge of the particles.

8. A device as defined in claim 7, **characterized in** that the electrostatic charging is effected by an external controllable current source (3).

9. A device as defined in claim 7, **characterized in** that the electrostatic charging is effected by friction charging the glue in the supply line (2).

10. A device as defined in the claims 7-9, **characterized in** that the portion (4) of the pipe (1), where the glue is supplied, is formed of a material which does not conduct away the charge of the glue and, respectively, particles.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EUROPEAN SEARCH REPORT

Application Number
EP 92 11 2993.8

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	US-A-4 510 184 (HERMANN WINKLER ET AL) * the whole document *	1,7	B 27 N 1/02
Y	DE-B2-1 908 957 (PAPENMEIER, LUISE) * column 3, line 1 - line 24 *	1,7	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 27 N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
STOCKHOLM	17-11-1992	JENSEN O.

CATEGORY OF CITED DOCUMENTS

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