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(54) **A process for distribution of a binder on loose particles**

(57) The process for distribution of a binder on loose particles involves electrostatically charging the binder and spraying it in electrified micronised form on a mov-

ing mass of loose particles. The process is particularly applicable in the manufacturing of wood chip panels bonded by synthetic resin glue.

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Description

[0001] Specifically, though not exclusively, the invention can be useful in the manufacturing of agglomerated and compressed wooden articles, made of wood particles or fibres agglomerated by means of a synthetic-resin-based glue. The process can be particularly useful in the production of wood-based panels, such as chip-board, OSB and MDF panels, wood-fibre panels and so on.

[0002] Known wood-based manufacturing processes include a phase in which the binder (glue) is distributed on the loose particles. This operation can be done, for example, using rotating cylinders having nozzles for spraying the glue on to the moving wood particles. The mass of wood particles is generally kept in a continuous mixing movement, for example by means of mixing drums or other apparatus; the process is then continued with a formation and pressing phase of a layer of particles sprayed with glue, producing a panel.

[0003] One of the drawbacks of the prior art consists in the fact that the glue is relatively very expensive and, in order to obtain a well-bonded agglomerate, is needed in large quantities, with a consequent increase in overall finished product costs.

[0004] The main aim of the present invention is to obviate the above-mentioned drawback inherent in the prior art, by making available a process which enables a binder to be distributed efficiently on loose particles while making a considerable saving on the binder itself.

[0005] The invention advantageously provides a high cohesion among large quantities of loose particles with a relatively small consumption of glue.

[0006] An advantage of the invention is to make possible an agglomeration of a considerable quantity of wood chips by means of a relatively small quantity of glue.

[0007] A further advantage is to obtain an even distribution of glue on a mass of wood chips or particles in movement, especially in the manufacture of wood-based panels.

[0008] A further advantage is the reduction in manufacturing costs per article, especially panels, made of wood particles agglomerated by means of synthetic resin glues. Furthermore, the panels obtained using the method of glue distribution of the present invention exhibit excellent mechanical qualities in terms of compaction and resistance.

[0009] A still further advantage is that the process can be made industrially feasible simply by making simple modifications to existing apparatus.

[0010] These aims and advantages and more besides are all attained by the present invention, as it is characterised in the following claims.

[0011] Further characteristics and advantages of the present invention will better emerge from the detailed description that follows of a preferred but non-exclusive embodiment of the invention, which is intended purely

as a nonlimiting example.

[0012] A process for distribution of a binder on loose solid particles, according to the present invention, involves electrostatically charging the glue and then spraying it on the loose chips.

[0013] The process is preferably used in cases where the binder is of the type which acts by virtue of adherence to the surfaces of the loose chips. Other uses for the process may be envisaged, however, in the field of attaching loose particles by means of a binder, in which the process of the invention relates specifically to the phase of binder distribution on the solid particles.

[0014] In a preferred embodiment, the process is used in the manufacture of agglomerated and compressed wood articles, for distributing adhesive on wooden particles. In this case the loose particles are made up of wood chips or fibres, while the binder is a glue, preferably synthetic resin-based.

[0015] The process involves applying the agglomerate particles (the binder being a glue, for example) in an electrostatically-charged state on a moving mass of loose particles (for example, wood chips or fibres).

[0016] Further, in a special embodiment of the process, the loose particles are mechanically mixed both during the application of the glue and afterwards, with the aim of better amalgamating the glue and particles. Drum mixers or other known apparatus can be used for this.

[0017] In a preferred embodiment, the process involves dropping the loose particles (for example, wood chips) from an end of a conveyor device into a glue-filled environment, the glue being micronised and electrified. The conveyor device can be, for example, a screw conveyor of known and normal type, or a conveyor belt, or another type.

[0018] The above-mentioned environment containing micronised and electrified particles can be created in several ways, such as for example by spraying the glue into a chamber predisposed upstream of the drum mixer, using a spraying device connected to an electrostatic generator, so that the micronised glue particles exiting from the device are electrostatically charged. The spraying device can be constituted by one or more atomisers of the type normally used for electrostatic spray-painting. In this case each atomiser has at least one spray nozzle connected up to one of the poles of an electrostatic generator, with the other pole being earthed. This device can spray micronised particles of adhesive, electrostatically charged and forming a cloud of droplets internally of the chamber.

[0019] In the case of manufacture of wood-based panels, where the binder is a synthetic-resin-based glue, and the loose particles wood chips or fibres, the agglomerated product obtained after the phase of distribution of the glue can be remixed and subsequently pressed, using known techniques, to make the panels.

[0020] The process can also be used for distributing binders, especially adhesives, on loose particles consti-

tuted by materials other than wood, such as for example material fibres, shreds of paper or cardboard or plastic, cork fibres, and so on, all with the aim of producing panels or other articles made of agglomerated or pressed particles. These loose particles can be obtained, for example, from shredded recycled products and cuttings and shavings resulting from other industrial processes, and can then be processed to produce special pressed panels made of agglomerates.

[0021] It has been established that the above process results in an effective distribution of binder (such as a glue) on loose particles with a considerable saving in the binder itself. Experimental results have shown that panels of excellent quality can be obtained, with savings in the quantity of glue used in comparison with known processes.

[0022] It has also been shown that the electrified droplets of glue are distributed evenly and uniformly on the surfaces of the loose particles, which means that a large quantity of loose particles can be agglomerated using a limited amount of glue. The result is even better when the droplets of glue are atomised internally of a chamber through which the loose particles are made to pass.

iting from said spraying device are electrostatically charged.

Claims

1. A process for distribution of a binder on loose particles, characterised in that said binder is electrostatically charged and sprayed on said loose particles.
2. The process of claim 1, characterised in that said loose particles are at least partially constituted by wood chips.
3. The process of claims 1 or 2, characterised in that said binder is a glue, preferably synthetic resin-based.
4. The process of any one of the preceding claims, characterised in that glue is sprayed on a moving mass of loose particles.
5. The process of claim 4, characterised in that the loose particles are mechanically mixed subsequently to application of the binder.
6. The process of claim 4 or 5, characterised in that the loose particles are made to fall from a discharge end of a conveyor device internally of an environment containing micronised and electrostatically charged particles of binder.
7. The process of any one of the preceding claims, characterised in that the binder is sprayed through a spraying device connected to an electrostatic generator in such a way that the binder particles ex-