APPARATUS FOR CONTINUOUS MANUFACTURE OF CHIPBOARD

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Filed: Oct. 26, 1971

Appl. No.: 192,373

Foreign Application Priority Data
Oct. 30, 1970 Germany P 20 53 351.1

U.S. Cl. 425/373
Int. Cl. B29J 5/08, B30b 5/04
Field of Search 425/373

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ABSTRACT

Apparatus for the continuous manufacture of chipboard comprising an endless steel band encircling a portion of the circumference of a drum and adapted to press and cure the chip material and which includes hot gas heating means for heating the chip material through the steel belt. The heating means comprises a sheet metal housing surrounding the portion of the belt which runs against the drum, an oil heater for discharging hot air and exhaust gas into said housing and a recirculating duct for carrying the discharged gases back to the point where the fresh gases enter the housing. The sheet metal housing may be of a configuration to direct the gases flowing through the housing into a tortuous path to promote heat transfer.

7 Claims, 1 Drawing Figure
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APPARATUS FOR CONTINUOUS MANUFACTURE OF CHIPBOARD

The invention relates to an arrangement for the continuous manufacture of chipboards, comprising an endless band made of steel, on to which is scattered a layer of wood chips to which binders are added, the said band being under tension and running continuously over a pressing roller and wrapping partially around the latter.

PRIOR ART

An arrangement for the continuous manufacture of chipboards has been proposed, in which an endless band partially wraps around a pressing roller and presses a heaped layer of wood chips against the said roller.

With this arrangement as proposed, difficulties arise in connection with the heating of the pressing roller for the final hardening of the chipboards. It is certainly true that the pressing roller itself can be cheaply and simply heated by steam under pressure, but the transfer of heat through the compressed layer of wood chips is very low, so that it can happen that temperatures which are too low can occur on the outside of the wrapping of material in the region of the band. Consequently, it is necessary for heat to be additionally supplied from outside. This cannot be effected with steam, because the necessary temperatures can only be produced with high steam pressures. These high steam pressures would make necessary a very complicated arrangement.

It would certainly be possible in principle to supply the heat from outside electrically, but this is very costly and disadvantageous, because it is difficult to provide for a uniform distribution of the heat supply to the band. If the heat supply is irregular, tensions are set up in the steel band, and these lead to impermissibly high loads on the band and more especially to distortions, which result in the layer or bed of wood chips being pressed on and compressed irregularly.

THE INVENTION

The invention has for its object to provide an arrangement for the continuous manufacture of chipboards, with which the heat is supplied from outside towards the band and thus to the layer of wood chips in an economical and simple manner.

The object forming the basis of the invention is achieved by the band, in the region in which it wraps around the pressing roller, forming at least partially a part of an air duct through which hot air is flowing.

The hot air in the air stream can be simply supplied with the exhaust gas of a burner, more especially an oil burner. Heat can be cheaply produced by such a burner without the more involved method of electric current, which is expensive. Since the exhaust gas of the burner can be fed directly into the air duct, heat exchanges are also superfluous, which would be necessary if the hot air were heated by steam, for example, by heat exchange.

The heat transfer between the hot gases and the steel strip is relatively poor, but it can be substantially improved by high flow velocities and by additional guiding plates or plates producing a turbulent flow.

Relatively low pressures are sufficient for producing a sufficient flow velocity, so that the sealing of the flow duct around the steel band does not present any difficulties.

It is expedient for the air duct to be arranged to provide a circulation in the region of the wrapping position of the band, so that the discharging air and exhaust gas is recirculated into the entry side. In order to supply heat to the circulation system, a burner, more especially an oil burner, is connected to the duct and supplies heat by means of its exhaust gas. By continuously supplying this exhaust gas to the duct, the quantity of the circulating gas increases. Consequently it is necessary to allow the excess gas to escape through an excess pressure valve. This excess pressure valve is most expeditiously arranged at a position in the circulation where the temperature is lowest. This position is usually just upstream of the connecting point for the burner, that is to say, downstream of the outlet point at the end of the wrapping of the band. It is obvious that all exposed parts of the duct are heat-insulated. The manufacture of the duct or the duct sections is possible in a quite simply manner from comparatively thin sheet metal, because the pressures being set up are low. The heat insulation also does not present any difficulties.

SPECIFIC EXAMPLE

The invention is to be more fully explained by reference to a constructional example shown in the drawing which is an elevational view of the apparatus, partly in section.

By means of a dispersing or scattering machine 1, chips 2 mixed with a binder are scattered on a band 3, which travels continuously in the direction of an arrow 4 over a table 5. In this way, a uniform layer or bed 6 of chips is formed. The band 3 travels with the bed 6 around a guide roller 8 on to a pressing roller 7 and wraps around the latter as far as a guide roller 9. The band is held under tension by means which are not shown. In addition, it is pressed by pressure rollers 10, 11, 12 and 13 against the pressing roller 7 in the wrapping region of the latter.

In the wrapping region, the band 3 is covered by a metal sheet 14, so that an air duct 15 is formed between the band 3 and the metal sheet 14. The inlet and the outlet of the air duct 15 are connected to one another by a hollow pipe 16, to provide for recirculating the gases. A fan 17 provides for a sufficiently high flow velocity, which guarantees a sufficient heat transfer between the band 3 and the gas. The plate 14 and duct 16 are insulated by heating insulating means 17 and 18. The heat insulation 18 is only partly shown.

Arranged on the metal sheet 14 are guide plates 19, 20 and 21 which project into the interstices between the pressure rollers 10–11, 11–12 and 12–13 and direct the hot air and gas into these interstices towards the band 3.

Connected to the duct 16 upstream of the fan 17 is a burner 22, which delivers heat into the circulating system by means of its exhaust gas. Excess pressure in the circulating system is avoided by an excess pressure valve 23, through which the excess gases are vented.

What is claimed is:

1. Apparatus for the continuous manufacture of chipboards, comprising an endless band consisting of steel, on to which is scattered a layer of wood chips mixed with binders, said band being under tension and running continuously on to a pressing roller and wrapping partially around the latter, characterized in that the
band, in the region in which it wraps around the pressing roller, forms at least partially a duct through which hot gases are circulated.

2. Apparatus according to claim 1, characterized in that the pressing roller, in the region in which the band wraps around it, is covered with spaced gas-directing plates, both on the circumference and also laterally, so that the gas duct is formed between these air-directing plates and the steel band.

3. Apparatus according to claim 1, characterized in that this gas duct constitutes a recirculating system.

4. Apparatus according to claim 2, characterized in that gas-directing plates are disposed to direct the gas towards the steel band.

5. Apparatus according to claim 4, characterized in that the gas-directing plates lie between pressure rollers, which press the steel band against the pressing roller, so that the gas is directed between the pressure rollers towards the steel band.

6. Apparatus according to claim 1, characterized in that the hot air is heated by the exhaust gases of a burner.

7. Apparatus according to claim 6, characterized in that the burner is connected to the circulating system, which system is vented by an excess pressure valve at the point at which the lowest temperatures occur.