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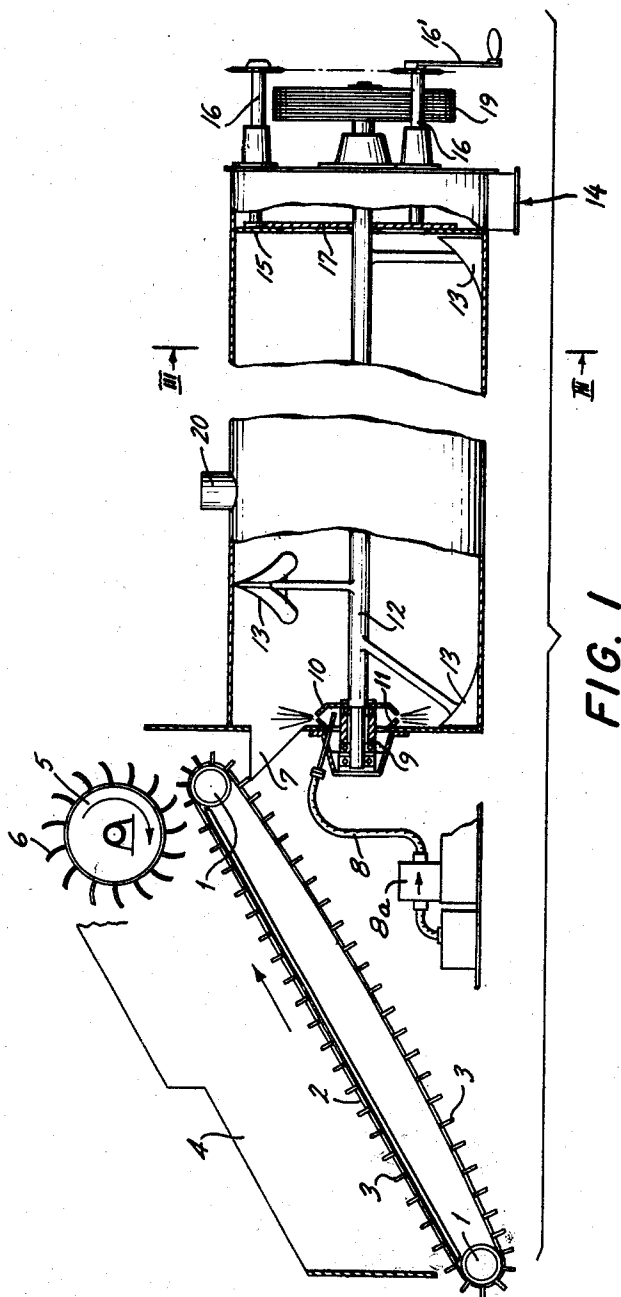
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GLUING MACHINE WITH AN INCORPORATED GLUE ATOMIZER

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 2

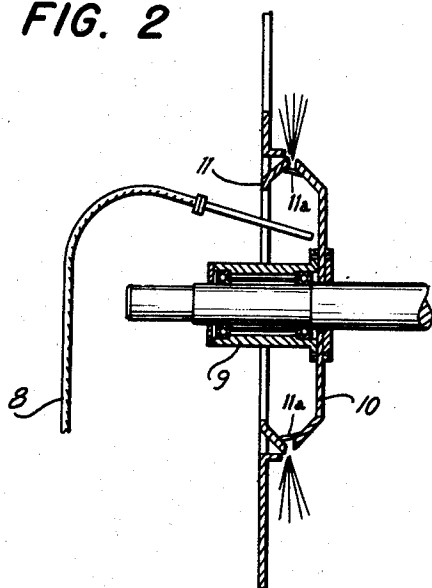


FIG. 3

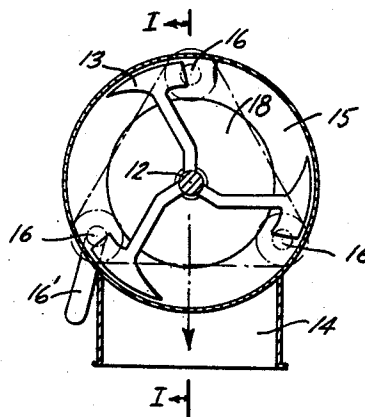
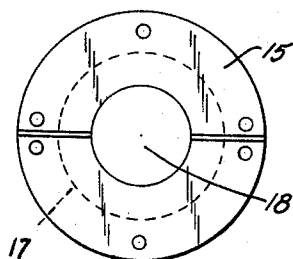


FIG. 4



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1

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6 Claims. (Cl. 118—303)

This invention relates to a gluing or wetting machine with an incorporated glue atomizer.

For wetting or gluing granular, fibrous and similar substances, especially for gluing wood chips for the manufacture of press-boards, it has been the usual practice to use mixers the main purpose of which was only to circulate the wood chips in the mixer, i.e. always to bring other chips to the surface. For this purpose, the mixing container comprised a trough-like member open at the top. Arranged in the upper part of this open trough were nozzle devices through which the glue was sprayed by means of compressed air on to the circulating chips. In the first place, this type of glue-mixing device is very costly to produce, secondly, it is very expensive to operate, owing to the considerable consumption of compressed air, and thirdly, this type of equipment is very susceptible to breakdowns on account of the heavy work involved in the manufacture of press-boards.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is an elevation of the apparatus contemplated herein, partly in section, to show the inner working of the apparatus, the section being taken along line I—I of Fig. 3;

Fig. 2 is an elevation showing in section a portion of the apparatus shown in Fig. 1, at a larger scale, the section also being taken along line I—I of Fig. 3;

Fig. 3 is a transversal section of a portion of the apparatus shown in Fig. 1, the section being taken along line III—III of Fig. 1; and

Fig. 4 is a transversal view of the throttle used in the apparatus shown in Fig. 1.

Generally speaking, the present invention contemplates, as shown in Fig. 1, an intermittently or continuously operable mixer having rotary blades which produce a whirling action the mixer comprising a mixing vessel of substantially cylindrical shape in which a shaft rotates about an axis parallel to that of the vessel, rotary mixing blades similar to ploughshares rotating at a predetermined speed and being fixed on arms and spaced at certain angular intervals about said shaft. A rotary blade throwing only to one side inwardly of the vessel is arranged at each end of the mixing vessel whereas the rotary blades which are arranged between said end blades throw towards both sides.

By means of a traveling belt on which driver pins are arranged at predetermined intervals and above the upper end of which a rejection wheel or drum rotates at a predetermined speed in a direction opposite to that of the belt,

2

the said wheel also being fitted with driver pins curved back slightly and spaced at predetermined intervals, the chips are fed in measured quantities in a continuous flow to the inlet opening in one end wall of the mixer vessel.

A pump supplies the glue in a continuous flow and in measured quantities into a centrifugal apparatus, which is shown in greater detail in Figure 2. This centrifugal apparatus rotating at high speed and driven by an independent motor (not shown) is arranged on the shaft of the rotary mixing mechanism in the mixer just inward from the inlet opening for the chips and projects the glue in an atomized condition on to the chips whirling in the mixer. The rotary mixing mechanism (Figures 1 and 3) rotating at a predetermined speed in the mixer constantly tosses and whirls the chips in the mixer, whereby the glue which may possibly have been taken up by the chips in non-uniform amounts on their surfaces is more evenly distributed as a result of friction between the whirling chips.

Arranged at the other end of the mixing vessel between the last inwardly throwing mixing blade and the outlet opening of the mixing vessel, for use when the said mixture is charged intermittently, is an adjustable throttle device (Figures 1 and 4). During the mixing process, this throttle device prevents the discharge of the chips. However, when the throttle plate is displaced towards the right, it uncovers the discharge opening so that the material can then run out.

For a continuous mixing operation, the throttle device consists of a fixed ring (Fig. 3) which is not adjustable. In this case, an overflow opening is left between the mixer shaft and the inside edge of the throttle ring and the mixed material can flow over through the said opening when a predetermined charging height of the mixed material in the mixer is reached. The internal diameter of the said ring determines the height to which the mixed material fills the mixer. If the internal diameter is large, the charging height of the mixer is reduced, and if the diameter is smaller, then the charging height of the mixer is increased. With an increased charging height, the friction between the chips is increased, with the result that the glue is spread more quickly and more thoroughly on the surfaces of the chips. With a smaller charging height, the friction and the spreading of the glue on the surfaces of the chips are reduced.

In carrying the invention into practice advantageously, an apparatus having the detailed structure shown in the drawings is used. As shown in the accompanying drawings, the rollers or sprocket wheels of the belt-type chip-supply device are indicated by the reference numeral 1. The traveling belt of the chip-supply device, which belt can be similar to a driving belt or can consist of two chains which travel parallel to one another and which are connected at predetermined intervals by cross-bars, is indicated in the drawing at 2. Driver pins 3 are arranged on the said travelling belt or on said cross-bars at predetermined intervals and lateral limiting walls 4 are arranged along both sides of the said belt. Installed above the upper end of the traveling belt 2 is a rejection wheel or drum 5 which is adjustable in height and which rotates at a predetermined speed in the direction of the arrow. Driver pins 6 are also arranged at predetermined angular intervals on the said rejection drum extending over the width of the conveyor belt, which pins are curved slightly rearwardly at the end. When the rejection drum is rotating at a predetermined speed, the moving pile of chips on the traveling belt is compressed by the curved driver pins, since they exert a slight pressure, and the surface of said

pile is levelled because the chips above a certain height are rejected or thrown back. The chips fed in quantities determined by the rejection drum drop at the upper end of the belt in a continuous flow, either first of all on to an inclined tiltable control plate which is able to actuate a signal light contact when the flow of chips is interrupted, or directly into the supply opening 7 of the mixing container. By means of a pump 8, the glue or similar product is supplied in measured quantities through a flexible pipe 8 to a centrifuging atomizer apparatus installed within the mixing vessel adjacent to the supply opening 7. In order to be able immediately to detect interruptions in the supply of glue, a control device can be installed between the pump and centrifuging apparatus, which device also actuates an electric contact and thereby switches on a signal lamp which indicates the interruption in flow. The centrifuging atomizer apparatus (Figure 2) is mounted on the mixer shaft and is driven by an independent motor (not shown) by way of a belt pulley 9. A dish-shaped centrifuging plate 10 which can be unscrewed for cleaning purposes is arranged on an extension of the belt pulley 9 inside the mixing vessel, the glue being supplied to the said plate through the flexible pipe 8. In order to intercept any possible splashes of glue, a conically shaped ring 11 with a slightly larger external diameter than the centrifuging plate 10 is arranged opposite the latter, the said ring being rigidly connected to the plate 10 at a small distance therefrom by means of a number of struts 11a. During the rapid rotation of the centrifuging apparatus, the glue flows to the outside edge of the centrifuging plate and is atomized under the action of centrifugal force, so as to be then ejected in the form of a mist and deposited on the surfaces of the chips dropping into and whirling in the mixer. The tossing blades 13 which are mounted on long arms on the shaft 12 and are spaced apart at certain angular intervals and longitudinally along the shaft constantly maintain the material in the mixer in a tossing and whirling condition as the said blades rotate, and during this process the chips frictionally engage each other and thereby the glue which is possibly not uniformly taken up by the said chips is uniformly distributed over the entire surface of the individual chip.

An adjustable throttle device (Figs. 1 and 4) consisting of a two-part stationary ring 15 and a movable plate 17 is arranged between the discharge opening 14 and the last inwardly throwing blade 13 for use when the mixer is intermittently operated. When the plate 17 is displaced towards the right by means of the adjustment device 16 comprising threaded spindles operatively interconnected for being rotated by means of a crank 16', it clears the way from the opening 18 of ring 15 to the discharge opening 14 so that the glued chips are able to flow out freely or are thrown out by the rotary mixing mechanism in the mixer. When the mixer is to be operated continuously, the plate 17 of the throttle device is removed. The outer ring 15 is then still a throttling ring with a large internal diameter, which is not adjustable. An overflow opening 18 is provided between the inside edge of the throttling ring 15 and the shaft 12 of the tossing mechanism and it is possible for the whirling chips to flow through the said opening when the chips in the mixer have exceeded a predetermined charging height and to leave the mixer through the discharge opening 14. The rotary blades in the mixer are driven by a motor through a belt pulley 19. Arranged on the mixing vessel is a supplementary inlet pipe 20 through which additives can be supplied to the chips whirling in the mixer.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of gluing and wetting machines for wood chips differing from the types described above.

While the invention has been illustrated and described as embodied in a machine for intermittently or continuously gluing or wetting waste or artificially produced wood chips and similar products, it is not intended to be limited

to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A machine for intermittently or continuously gluing or wetting waste or artificially produced wood chips and similar products, comprising, in combination, traveling belt means for continuously moving chips into position for treatment; a mixer means located adjacent said traveling belt means and having a feeding opening facing said belt means for receiving chips therefrom and for mixing the chips, said mixer means comprising a stationary, substantially cylindrical vessel extending substantially in horizontal direction and having a substantially centrally located rotatable shaft, radial arms extending from said shaft and agitating elements mounted at the end of each of said arms; driver pin means on said belt means for gripping said chips and rejection drum means rotatable in a direction opposite to the movement of said belt means and having rejection pins, said drum means being arranged above said belt means and cooperating with said driver pin means for equalizing the flow of chips and for continuously supplying said chips into said mixer means in measured quantities; atomizer means located at the part of said mixer means which receives the chips from said belt means for spraying a liquid binding agent on said chips as they enter said mixer means, said atomizer means comprising rotary atomizer discs for centrifugal action rotatably mounted on said shaft, and independent drive means for rotating said discs at high speed, said liquid binding agent such as glue being further distributed on the surface of the chips by the friction of the chips with one another while they are mixed; pump means communicating with said atomizer means for supplying the liquid binding agent to said atomizer means; and throttle means and discharge means at a part of said mixer means distant from the part thereof which receives said chips from said belt means for determining the charging height in the mixer means and for controlling the discharge of the chips from said mixer means through said discharge means.

2. A machine as set forth in claim 1, wherein said rejection pins of said rejection drum are curved back in direction opposite to the direction of rotation of said drum means for compressing the stream of chips moving on said belt means.

3. A machine as set forth in claim 1, wherein said mixer means have a second feeding opening for the introduction of ingredients or filler material to be mixed with said chips.

4. A machine as set forth in claim 1, wherein said throttle means comprise plate means extending transversely across said mixer means and including a removable inner ring for forming an opening for continuous overflow discharge of said chips through said opening.

5. A machine as set forth in claim 1, wherein said throttle means comprise plate means extending transversely across said mixer means and including exchangeable valve rings for forming an opening of required size for continuous overflow discharge of said chips through said opening.

6. A machine as set forth in claim 1 wherein said agitating elements have the shape of ploughshares.

References Cited in the file of this patent

UNITED STATES PATENTS

660,579	Leonard	Oct. 30, 1900	2,294,523
1,164,948	McCarren	Dec. 21, 1915	2,601,355
1,202,130	Vasey	Oct. 24, 1916	2,604,416
1,223,083	Lynn	Apr. 17, 1917	2,646,774
			2,698,815
			2,713,846
			2,761,420

Veazey	Sept. 1, 1942
Wyss et al.	June 24, 1952
Dolbey	July 22, 1952
Fairfield	July 28, 1953
Bishop	Jan. 4, 1955
Craig	July 26, 1955
Mottet	Sept. 4, 1956