FIG. 1

FIG. 2

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FIG. 6

FIG. 7

FIG. 8

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APPARATUS FOR PRODUCING UNIFORM MATS OF POURABLE PARTICLE MATERIAL

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Our invention relates to apparatus for the production of formed bodies or sheets of pourable particle material, and more particularly to apparatus for forming a supply of wood particles, such as shavings, into mats to be subsequently compacted and solidified into solid wood-particle boards or panels.

In the manufacture of boards from wood particles it is known to loosely deposit a heap of particles, preferably coated with a binding agent, onto a surface bordered by a frame of the size of the board to be produced, and to then distribute the particles manually or by auxiliary devices over the frame-bordered area before subjecting the resulting mat to subsequent fabricating operations which by pressure, or pressure and heat, reduce the mat thickness to that of the desired board and simultaneously cure the binding agent to convert the product into a solid body.

Considerable difficulties have been encountered with this method to produce particles of uniform density and uniform strength. These difficulties are due to the fact that, even with a seemingly uniform distribution of the wood particles on the mat-forming area, the resulting mat has localities of a rather loose texture as well as localities of denser packing or lumpy texture. Such irregularities are inevitable with particle materials of a pronounced interfacing or felting tendency. A uniform distribution as regards density, height and texture over the entire length and width of a mat is particularly difficult to obtain with wood particles intentionally cut to the shape of elongated shavings of good interfacing properties. While such shavings are favorable for high quality boards, it is impossible to prevent such shavings from intertwining, interweaving or lumping prior to being deposited on the mat-forming area. The storage silos, bins and conveying devices always necessary for large scale manufacture tend to promote such a premature interlacing with the result that the known particle-depositing and mat-forming devices are inadequate to produce uniformly textured mats.

It is an object of our invention to eliminate these difficulties and to provide a fabricating apparatus capable of loosely distributing and depositing a supply of pourable particles, particularly wood particles with interfacing tendencies, to thereby form preshaped bodies, blankets or mats of uniform thickness, and homogeneous density and texture.

Another object of our invention is to make such an apparatus readily adjustable as to thickness or density of the mats to be formed.

Still another object of the invention is to make such apparatus automatically controllable as to the amount or distribution of the particle material being supplied to the mat-forming device.

To achieve these objects and in accordance with our invention, the apparatus comprises an endless feeder conveyor that extends horizontally or approximately horizontally between the stock-supply means and the forming conveyor so that the feeder conveyor receives the particle stock from the supply means before the stock can reach the forming conveyor. An endless-belt scraper is disposed above the feeder conveyor and extends therefrom at an acute angle of inclination with the lower end of the scraper run located near the discharging end of the feeder-conveyor run while the upper end of the scraper run lies closer to the particle supply means. The scraper thus has an active range that faces the amount of particle stock deposited upon the feeder belt, and the stock is first subjected to scraper action and must pass between the scraper and the surface of the feeder conveyor before being passed toward the forming area.

Consequently, only a limited amount of stock material, adjusted in accordance with the particular requirements, can pass onto the forming area, and this amount is uniformly distributed over the entire width of the feeder conveyor and hence is dispensed to the forming conveyor in an accurate dosage and an even distribution.

At the same time, the amount of stock accumulated on the feeder conveyor in front of the endless-belt scraper is seized by the scraper and thus dispersed and thrown back. Thus any non-uniformity of particle distribution on the feeder conveyor is equalized, the stock material is evenly dispersed over the conveyor width, and the texture of the heap of stock ready to be dispensed is converted toward better uniformity. As a result the stock material leaving the feeder conveyor is distributed onto the forming area of the forming conveyor in a thin and uniform stream so that the body or mat being formed assumes a uniform thickness and texture.

A further improvement as to textural uniformity of the formed body is obtained by providing the apparatus, according to another feature of our invention, with a rotating distributor member such as a rotary brush or spike drum, that extends along the entire width of the feeder conveyor adjacent to the end of its conveying run. The rotary distributor member is preferably driven at a peripheral speed higher than the conveying speed of the feeder conveyor and in such a direction of rotation that the distributor member throws the stock material away from the feeder conveyor in a direction toward the center of the apparatus.

According to still another feature of our invention, the output of the forming apparatus is increased by providing a plurality of feeder conveyors and scrapers, preferably also a corresponding plurality of distributor members, to supply stock material onto the same forming conveyor. Such an apparatus may be provided with a twin arrangement of the feeder conveyors and scrapers in which the two feeder conveyors are located side by side and have mutually opposed and outwardly directed conveying directions. When providing such a twin arrangement with rotating distributor members, these members are preferably given mutually opposed running directions so that each member throws the stock material toward the other.

Apparatus according to the invention are preferably so designed that the spacing of the endless-belt scraper is adjustable relative to the feeder conveyor. As a result, the height of the particle accumulation being dispensed from the feeder conveyor, and hence the height of the body or mat to be formed, can be varied to suit desired requirements. According to a more specific feature, the endless-belt scraper is made rotatably adjustable about the axis of its uppermost belt pulley.
The individual scraper elements of the scraper in apparatus according to the invention are preferably given such a distribution over the width of the scraper belt that the tips of the scraper elements define an envelope curve adapted to the shape of the particular product to be formed. For the production of wood-particle mats to be subsequently compressed and solidified into composition boards of even thickness, the envelope curve is preferably given a shape that bulges from the scraper belt toward the feeder conveyor and has a flatter curvature in its middle than at its ends.

Depending upon the particular stock material to be processed, it is in some cases of advantage to provide two or more serially-operating feeder conveyors with respective rotating distributor members. For instance, according to another feature of the invention, an auxiliary feeder conveyor is disposed between the above-mentioned feeder conveyor and the forming conveyor in parallel relation to both, and the auxiliary feeder conveyor is equipped with another distributor member at the end of its conveying run.

Apparatus according to the invention may further be equipped with particle-conveying means that extend from the endless-belt scraper and receive from the scraper any excess stock that have been sufficiently like the scraper to reach the conveying means. In one embodiment of the excess-removing conveying means consists of another endless-belt conveyor and is located above the feeder conveyor in front of the operating run of the scraper near the upper end of that run. According to another embodiment, an excess-removing conveyor is disposed on the idle-run side of the endless-belt scraper, and the scraper belt is guided over pulleys so that it passes from its uppermost belt pulley down to the excess-removing conveyor at an inclination less than that of the operating run of the scraper.

According to a further feature of our invention, we provide the apparatus with condition-responsive control means which have one or more sensing members, such as photoelectric cells or feeler contacts, disposed above the feeder conveyor for controlling or regulating the supply of stock in order to keep the stock pile on the feeder conveyor within desired limits or to stop the apparatus upon depletion of the stock pile.

The foregoing and other objects, advantages and features of our invention will be apparent from, and will be described in conjunction with, the embodiments exemplified by the drawings, in which—

Fig. 1 is a schematic side view of a particle-mat forming apparatus for use in the manufacture of wood composition boards;

Fig. 2 is a partly sectional front view of the same apparatus, the section being taken along the line denoted by II—II in Fig. 1;

Figs. 3 to 8 show schematically six other embodiments of particle-mat forming apparatus by respective side views; and

Fig. 9 is a circuit diagram of a particle-supply controlling device applicable in the apparatus according to Figs. 1 and 2 as well as in conjunction with any of the other embodiments.

In all illustrations, similar elements are denoted by the same reference numerals respectively.

In the apparatus according to Figs. 1 and 2, the particle stock consisting, for instance, of wood particles coated or impregnated with a binding agent, is supplied from a source generally denoted by 1. This source is shown to consist of a supply conveyor 2 which receives the stock from a silo or bin (not shown) and discharges it into the apparatus along stationary guiding wall structures 3 (Fig. 2) and 4 (Fig. 1). However, the particle supply means may also consist of a chute or hopper as exemplified in other illustrations (Figs. 3, 6), or of the discharge conduit of a wood shredding machine.

From the supply means, the particle stock drops upon a feeder conveyor 5 of the endless-belt type whose conveying direction is indicated by an arrow 6. The conveyor belt extends from a front pulley 7 and a rear pulley 8. These pulleys are journaled in a stationary mounting structure as shown at 9 for pulley 7 (Fig. 2). The upper surface of the feeder conveyor 5 is bordered by side walls 10 (Fig. 2) mounted on the stationary frame structure 9.

Disposed above the feeder conveyor 5 is an endless-belt scraper 11 with upper and lower belt pulleys 12 and 13. The width of the scraper is substantially equal to that of the feeder conveyor 5. The lower pulley 13 is located near the front pulley 6 of the feeder conveyor 5, and the scraper 11 extends from the feeder conveyor upwardly at an acute angle of inclination against the conveying direction 6' of the feeder conveyor. The scraper 11 runs in the upward direction, as denoted by an arrow 11', at the scraper side facing the stock supply.

The amount of stock material passing between the scraper 11 and the conveying surface of the feeder conveyor 5 is discharged near the front pulley 6 of the feeder conveyor and drops onto the surface of an endless forming conveyor 16. Conveyor 16 runs parallel to the feeder conveyor 5 and is guided by pulleys 17 and 18. The travelling direction of the forming conveyor is indicated by an arrow 16'. During the operation of the apparatus, the amount of stock being deposited from feeder conveyor 5 forms on conveyor 16 a mat or blanket 19 of uniform thickness and uniform texture as explained in the foregoing. The forming area on conveyor 16 is laterally limited by side walls 20 that may be stationary secured to the frame structure of the machine as shown in Fig. 2, or that may travel together with the forming conveyor.

The width of the forming area limited by the side walls 20 is substantially equal to the width of feeder conveyor 5 and scraper 11.

The endless belt of the scraper 11 carries a large number of individual scraper members 14, such as spikes, pricks, pins, wires, bristles, scraper boards or other suitable means, that are distributed over the entire belt area. The scraper members can be given different respective lengths along the width of the scraper belt so that the scraper tips define an envelope curve of any desired shape and curvature. For instance, when the mats being produced show the tendency to taper from the center toward the sides, as is the case with various wood particles, then the envelope curve of the scraper tips is preferably given a curvature bulging toward the feeder conveyor, as is shown in Fig. 2. The illustrated envelope curve has a flatter shape in its middle than toward its ends so that the scraper secures a distribution of the particle stock over the width of the feeder conveyor as needed for equalizing the thickness of the mat being formed.

For adjusting the apparatus to different quantities of stock material to be dispensed onto the forming conveyor, the endless-belt scraper is preferably made adjustable as regards its vertical spacing from the conveying surface of the feeder conveyor. In the apparatus according to Figs. 1 and 2, the upper belt pulley 12 of the scraper 11 has a stationary journaled shaft 12'. The shaft 13' of the lower pulley 13 is journaled in arms 8 that are rotatable about the axis of pulley shaft 12' so that the lower belt pulley 13 of the scraper 11 can be raised and lowered, for instance, between the positions shown in full lines and broken lines respectively (Fig. 1). This permits obtaining the desired variation in spacing. The same result, however, may also be secured by other means, such as by lifting and lowering the feeder conveyor 2 at its discharge end.

As explained, the amount of particle stock that accumulates in front of the scraper 11 is subjected to an upwardly directed scraping action, and the foremost portion of the stock, as far as it does not pass beneath the scraper to the discharge end of the conveyor run, is entrained upwardly and thrown back to the rear of the pile of stock on the feeder conveyor. For eliminating any excess
amount of stock that may interfere with the proper operation, the apparatus shown in Figs. 1 and 2 has an additional conveyor 21 located in the throw range of the scraper 11 to carry off material that may be entrained by the scraper 11 into the deep portion of its working path. Instead of providing such an excess-removing conveyor, and according to another feature of the invention, the apparatus may also be equipped with condition-responsive means that facilitate or effect a control or regulation of the supply of stock or the operation of the feeder conveyor within desired limits. To this end, the modified apparatus shown in Fig. 3 is provided with a condition-responsive device 22, such as a feeder contact, a photoelectric cell or other sensing member, located at the proper height above the feeder conveyor 5 so as to respond to presence or absence of stock material at that height. When the accumulated pile of stock in front of the scraper 11 reaches a given limit, the sensing member 22 releases a signal indicating that the stock supply is to be stopped, or it automatically causes the supply means to stop and to resume delivery only when the height of the stock pile has again dropped below the limit. This will be further described below with reference to Fig. 9.

Another sensing member for automatic control is shown at 25 in Fig. 3. This member, for instance a photo-electric cell, is located near the bottom portion of the scraper 11. When the member 25 responds to absence of stock, it releases a warning signal indicating the depletion and/or causes the apparatus as well as any subsequently operating fabricating devices to stop operating. This will also be further described with reference to Fig. 9.

The apparatus shown in Fig. 3 is otherwise similar to that of Figs. 1 and 2, but is further equipped with a rotating distributing member 26 at a place adjacent to the end of the conveying run of feeder conveyor 5. Member 26 consists of a spike drum, wire brush or a similar rotating device that extends along the entire width of the feeder conveyor to receive or remove stock therefrom. The member 26 rotates in the direction indicated by an arrow 26 at a peripheral speed higher than the conveying speed of the feeder conveyor 5 so that the particles of stock are thrown off the member 26 substantially in the horizontal direction before the stock drops upon the forming area of the conveyor 16. A stationary wall 27 is provided to properly guide the stock material from the feeder conveyor along the distributor member 26. By virtue of the throwing action of member 26, the particles are distributed over a relatively wide range well separated from one another while in flight. This improves the uniformity of stock distribution in the blanket or mat 19 being formed.

The apparatus shown in Fig. 4 is essentially a twin arrangement of two feeder conveyors 5, two endless belt scrapers 11 and two rotating distributor members 26, supplied from a single source of stock 1 and coasting to jointly produce a mat 19 on a single forming conveyor 16. The two feeder conveyors 5 are located side by side, and their respective directions 5’ of conveying travel are opposed to each other away from the center of the twin arrangement. A stationary separator wall 28 is provided beneath the supply source 1 for distributing the stock onto the two feeder conveyors. The two fast-rotating distributor drums 26 operate in mutually opposed directions, preferably so that both fling the particles toward the twin arrangement. If the stock material is not composed of entirely equal particles and a condition often encountered, then the thicker and heavier particles are thrown by each drum 26 farther than the thinner and lighter particles. In the stray area of the member 26 at the right-hand side of the apparatus, the light-weight particles, therefore, will drop onto the forming conveyor 16 at points closer to the member 26 than the heavier particles. Consequently, the heavier particles are deposited on top of the lighter particles. In the stray range of the left-hand member 26, the heavier particles are deposited farther away than the lighter particles. As a result, any occurring thicker or heavier particles will appear in the center zone of the mat where they are less apt to be troublesome, while the lighter particles will be located at the mat surfaces, thus providing a symmetrical texture and improving the surface condition and appearance of the boards to be produced.

In the apparatus illustrated in Fig. 5, the stock material discharged from the feeder conveyor 5 is first distributed upon an additional feeder conveyor 30 so as to form a thin layer 31 thereon. The additional feeder conveyor 30 is preferably driven at a speed higher than that of feeder conveyor 5. From conveyor 31, the stock material is distributed onto the forming conveyor 16 by means of a rotary distributor member 26 having the same function as the member 26 described with reference to Figs. 3 and 4. The apparatus according to Fig. 5 is further provided with two rotary members 32 and 33 that extend across the discharge ends of the two feeder conveyors 5 and 30 respectively, the rotary members 32 and 33 operate as rake or scraper devices and may be similar to the distributor members 26 except that the members 32 and 33 engage the stock material just before it discharges from the end of the conveyor run. The rotary members 32 and 33 prevent the stock material from being discharged in lumps or interwoven bunches and hence secure a better dispersion of the layer of particles formed on the intermediate conveyor 30 and on the forming conveyor 16. If the stock material has an only moderate interlacing tendency and hence is sufficiently loosened and distributed by the first rotary member 32, the additional distributing members and the additional feeder conveyor may be omitted so that the stock material passes directly from member 32 onto the forming conveyor, as is the case in the embodiment described below with reference to Fig. 8.

As explained with reference to Figs. 1 and 2, a forming apparatus according to the invention may be equipped with an accessory conveyor for removing excess amounts of stock material from the pile accumulating on the feeder conveyor. According to another feature of our invention, such an excess-removing conveying device may also be disposed on the idle-run side of the endless-belt scraper. For this purpose, the belt of the scraper, while maintaining the desired inclination along its working run, is guided over one or several additional pulleys in such a manner that the scraper belt descends from its uppermost pulley along its idle run at an angle of inclination smaller than that of the working run. According to another feature, the working run of the scraper belt, extending between the lowermost and the uppermost belt pulley, may comprise two or more parts of respectively different angles of inclination.

The just-mentioned features are embodied in the apparatus illustrated in Fig. 6. The endless belt of the scraper 11 passes between its uppermost pulley 12 and its lowermost pulley 13 over an additional pulley 37 so that the working run of the scraper between pulleys 12 and 13 has two different angles of inclination. The scraper is further provided with a pulley 38 located behind the lowermost pulley 13 as seen in the travelling direction of the feeder conveyor 5. If the pile of stock in front of the working run reaches an excessive height, an amount of material is entrained by the scraper belt and is conveyed downward along the portion of the idle run extending between pulleys 12 and 38. Thus the excess material is carried to a conveyor 21 corresponding to the conveyor 21 shown in Figs. 1 and 2. The apparatus is further equipped with two distributing members 26 and 33 arranged and operative in the manner of the rotary members 26 and 33 described above with reference to Fig. 5. By virtue of the small angle of in-
ciliation in the lower portion of the scraper working run, the layer of particles passing through the gap between the scraper and the feeder conveyor is subjected to an essentially smoothing, equalizing treatment.

The twin arrangement illustrated in Fig. 7 is similar to that described with reference to Fig. 4, except that each feeder conveyor is associated with two rotating distributor members 33 and 26. Besides, the apparatus is equipped with a control device 39 that permits switching of the source 1 to one or the other of the two feeder conveyors 5. The device 39 consists essentially of a vane structure movable about a pivot 49 between the positions shown in full and dotted lines respectively. Three sensing members 22, 24, 25 such as photoelectric devices, are disposed above each feeder conveyor 5 along the working run of the associated scraper 11. These sensing members control the supply of stock from source 1, for instance, in such a manner that each uppermost sensing member 22, in response to the stock pile reaching a sufficient height, either effects an interruption of the stock supply or causes switching of control device 39 into its other position to thereby switch the supply of stock to the other conveyor. The lowest sensing member 25 may operate to again release the stock supply or to return the control device 39 into the first-mentioned position when the height of the stock pile on the feeder conveyor 5 declines to a minimum height. The intermediate sensing members 24, as well as any other intermediate sensing members (not shown) that may be provided, may serve to provide for a graduated throttling or increase in the supply of stock.

Fig. 8 shows an apparatus which combines four individual feeder conveyors 5 and four associated scrapers 11 for depositing stock material at four different places upon a single forming conveyor 16 to produce a single mat of particles. The two outer units dispense particle stock for the bottom and top layers respectively of the mat, while the particle stock for the intermediate layer of the mat is dispensed by the twin arrangement located between the two outer units. The stock for the intermediate twin arrangement is supplied from a source 1 under control by a switch device 39, while the stock for the two outer units is supplied from a separate source 1 under control by a switch device 39. The switch device 39 delivers the stock from source 1' either directly onto the right-hand feeder conveyor 5 or onto an auxiliary conveyor 41 that carries the material to the left-hand unit. Such an apparatus permits composing the mat of two different kinds of particles. For instance, the outer top and bottom layers of the mat may be formed of a high quality material such as fine shavings, while the intermediate layer of the mat may be formed of coarser and cheaper particles.

As explained in the foregoing, apparatus according to the invention may be equipped with condition-responsive devices that control the supply of particle stock in dependence upon the amount of stock material accumulated on the feeder conveyor (Figs. 3, 7, 8). When providing the apparatus with two (Fig. 3) or more (Fig. 7) sensing members, such as a photoelectric device, to effect such a control, the uppermost sensing member may preferably be used for detecting the height of stock when the beam of light impinging upon the sensing member is intercepted by the stock pile. The lowest sensing member is preferably used for again releasing the supply of stock, while any intermediate sensing members may serve to obtain a graduated reduction or increase in stock supply.

As further explained above (Fig. 7), such control devices may be used in a twin arrangement of feeder conveyors so that when the stock pile on one feeder conveyor reaches a given height, the supply of stock is switched to the other feeder conveyor or is interrupted if the height of the stock pile on the other conveyor has not yet declined below a given height. Each of the two units in such a twin arrangement of feeder conveyors may also be equipped with two or more sensing devices that are located at respectively different heights. The uppermost sensing device then switches the supply of stock to the other unit of the twin arrangement or stops the supply of stock, while the lowermost sensing device releases the supply of stock to the pertaining unit. Any intermediate sensing devices may serve to effect a graduated reduction or increase of stock supply. If desired, another sensing device may be disposed near the lowest point of the scraper in order to release a warning signal and/or to effect stopping of the apparatus as well as any subsequently operating fabricating devices when the stock pile is depleted to below the location of the additional sensing device.

An example of electric circuits suitable for operation with such condition-responsive control devices is schematically illustrated in Fig. 9. According to Fig. 9 two photoelectric sensing, devices 22 and 23, arranged as shown in Fig. 5, are provided together with an intermediate sensing device 25. The sensing devices 22, 23, 25 consist of photoelectric cells to cooperate with respective beams of light from lamps 42, 43, 45. Sensing devices 22 and 25 are connected with a motor control unit 46 for operating a variable-speed motor 47 from a current-supply line 48. The motor 47 is shown to drive a belt pulley member 49 for the feeder conveyor, corresponding to the conveyor 2 in Figs. 1 and 2, is part of the source of stock supply. That is, the conveyor 2 carries stock material into the apparatus, for instance from a silo or bin, so that the amount of stock being supplied per time unit depends upon the travelling speed of the supply conveyor. The control unit 46 is normally adjusted so that the motor 47 drives the supply conveyor 2 at a speed sufficient or nearly sufficient to supply the apparatus with the average amount of stock needed for normal continuous forming operations. This condition prevails as long as the beam of light from lamp 45 is intercepted so that sensing device 22 will respond. This causes the control unit 46 to stop or retard the motor 47. If for any reason the consumption of stock is higher than normal so that the accumulated stock pile on feeder conveyor 5 depletes below the sensing device 25, the device 25 will respond and thus cause the control unit 46 to operate the motor 47 at a higher speed.

If the pile of stock on the feeder conveyor 5 should become excessively depleted, light from lamp 43 will impinge upon sensing device 23. This releases a relay control unit 50 which then energizes two contactors 51 and 52 from line 48. Contactor 50 opens its contacts and thereby disconnects the motor control unit 46 from the supply line 48 so that motor 47 is deenergized and stops the supply of particle stock to the apparatus. At the same time, the contactor 52 deenergizes the drive motor 53 of the feeder conveyor 5 as well as the drive motor 54 of the forming conveyor 16 so that the entire apparatus is arrested. Contactor 52 also closes the circuit of a signal lamp 55 or other signalling device to indicate the stoppage.

It will be understood that various other control possibilities are available and may be used in conjunction with apparatus according to the invention, depending upon the particular requirements.

It will further be understood by those skilled in the art, upon a study of this disclosure, that the invention is not limited to the particular embodiments herein described and illustrated, but that the individual components of the various units may be combined in different ways depending upon the desiderata of any particular application. For instance, it is not neces-
sary in some cases to have the forming member move along and below the dispensing portion of the apparatus, but is also possible to achieve similar results by moving the dispensing portion of the apparatus relative to a stationary forming surface. It should also be understood that the invention is generally applicable to pourable material other than wood shavings, for instance chip and fibrous material of vegetable, mineral or other origin, although the invention is especially advantageous for use with particles of pronounced interlocking or interweaving tendencies.

We claim:

1. Apparatus for converting pourable particle stock, such as wood shavings, into a body of uniform particle distribution, comprising stock supply means, an endless feeder conveyor having a conveying path below said supply means to receive particle stock therefrom and having a discharging place at one end of said path, an endless-belt scraper located above said conveyor and forming together therewith a gap for the passage of particle stock, said scraper extending at an acute angle to said conveyor from a locality near said discharging place to a point closer to said supply means than to said feeder conveyor, said scraper having an upward direction of scraping movement at the scraper side facing said supply means and having a width substantially equal to that of said feeder conveyor, and a forming conveyor extending substantially horizontally below said discharging place and parallel to said feeder conveyor to receive particles from said feeder conveyor, said forming conveyor having a particle receiving area of a width substantially coextensive with that of said feeder conveyor.

2. Apparatus for converting pourable particle stock into a body of uniform particle distribution, comprising stock supply means, an endless feeder conveyor having a conveying surface below said supply means to receive particle stock therefrom, an endless-belt scraper disposed above said feeder conveyor in an inclined direction for engaging the particle stock on said feeder conveyor and having a scraping run extending from said feeder conveyor upwardly at an angle of inclination open against the travel direction of said feeder conveyor up to a height closer to that of said supply means than to said feeder conveyor, a rotatable distributor member adjacent to the discharging place of said feeder conveyor to fling discharged particles away therefrom, and a horizontal forming conveyor extending parallel to said feeder conveyor and having a particle receiving area below said distributor member to be charged with distributed particles.

3. Apparatus for converting pourable particle stock into a body of uniform particle distribution, comprising stock supply means, a twin arrangement of two endless feeder conveyors disposed horizontally side by side below said supply means to receive particle stock from said supply means, said feeder conveyors having respective outwardly directed conveying paths and having respective discharging places at the outer ends of said paths, two endless-belt scrapers each being disposed above one of said feeder conveyors and extending from said feeder conveyor upwardly and inwardly at an acute angle, two rotating members disposed adjacent to said respective discharging places for throwing particles away from said paths, each of said two members having a direction of throw forming surface member, and a horizontal forming conveyor extending below and along said rotating members to receive particles from both said members.

4. Apparatus for converting pourable particle stock, such as wood shavings, into a body of uniform particle distribution, comprising a substantially horizontal feeder conveyor, particle-stock supply means having a discharge point upwardly spaced from said feeder conveyor at a height sufficient for depositing a pile of stock onto said feeder conveyor, a substantially horizontal forming conveyor disposed below and parallel to said feeder conveyor to receive particle stock from said feeder conveyor, and endless-belt scraper disposed above said feeder conveyor for engaging the particle stock on said feeder conveyor, said scraper having a lowest reversing point upwardly spaced from said feeder conveyor so as to form a gap for the passage of particle stock between said scraper and said feeder conveyor, said scraper having an upwardly movable scraping run facing said supply means and extending from said reversing point upward at an acute angle toward said supply means to a height closer to the height of said discharge point than to said feeder conveyor, and said scraper having a horizontal width substantially equal to that of said feeder conveyor.

5. Apparatus according to claim 4, comprising conveying means for the removal of excess amounts of particle stock, said conveying means being disposed in the throw range of said endless-belt scraper near the uppermost travel-reversing point of said scraper at the scraper side facing said supply means.

6. In apparatus according to claim 4, said endless-belt scraper having an upper belt pulley and a lower belt pulley and being rotatably adjustable about the axis of said upper pulley for varying the vertical spacing of said lower pulley from said conveyor.

7. In apparatus according to claim 4, said endless-belt scraper having a multitude of scraper elements distributed over the length and width of said scraper, said elements having in the direction of said width a tip-envelope curve bulging toward said feeder conveyor, said envelope curve having a flattened shape in its middle range as compared with its end ranges.

8. In apparatus according to claim 4, said endless-belt scraper having an upper belt pulley and having a lower belt pulley near said discharging place so as to have its scraping run extend between said two pulleys, said scraper having another belt pulley located beyond said discharging place and at a height between said upper and lower pulleys whereby said scraper, between said upper pulley and said other pulley, forms a return-run portion of a lesser downward inclination than said scraping run so as to convey excess particle stock downwardly along said return-run portion, and conveying means near said other pulley for removing excess stock issuing from the end of said return-run portion.

9. In apparatus according to claim 4, said stock supply means having a control device for controlling the supply of stock to said feeder conveyor, and condition-responsive means connected with said device and having a sensing member disposed above said feeder conveyor in the vicinity of said endless-belt scraper for controlling said device in dependence upon the amount of stock accumulated on said feeder conveyor in front of said scraper.

10. In apparatus according to claim 4, said stock supply means having a control device for controlling the supply of stock to said feeder conveyor, condition-responsive means connected with said device and having a plurality of sensing members located at respectively different heights above said feeder conveyor in the vicinity of said endless-belt scraper for controlling the supply of stock in dependence of respective heights of the amount of stock located on said feeder conveyor in front of said scraper.

11. In apparatus according to claim 4, said stock supply means having a control device for controlling the supply of stock to said feeder conveyor, condition-responsive means connected with said device and having a sensing member disposed above said feeder conveyor in the vicinity of said endless-belt scraper for controlling said device in dependence upon the amount of stock accumulated on said feeder conveyor in front of said scraper, and a supervisory device having another sensing member located near the lowermost point of said endless-belt scraper for response to depletion of said amount of stock.

12. Apparatus for converting pourable particle stock into a body of uniform particle distribution, comprising stock supply means, an endless feeder conveyor having a
substantially horizontal conveying surface below said supply means to receive particle stock therefrom, an endless-belt scraper disposed above said supply conveyor in an inclined direction for engaging the particle stock on said feeder conveyor and extending from said feeder conveyor upwardly at an angle of inclination open against the travel direction of said feeder conveyor, two rotating rake devices extending transverse to said feeder conveyor at the end of the conveying run, one of said rake devices having an axis of rotation above said conveying surface and being peripherally engageable with the particle stock leaving said end, said one rake device having a downward direction of rotation at its stock-engaging side, said other rake device being disposed below said one device for throwing the particle stock dispersed onto a receiving area, and a mat-forming conveyor extending through said receiving area in parallel relation to said conveying surface and below said other rake device, said forming conveyor and said endless-belt scraper as well as said two rotating devices extending over the entire conveying width of said feeder conveyor.

13. Apparatus according to claim 12, comprising an intermediate endless conveyor extending parallel to said feeder conveyor and between said two rotating devices at a height intermediate said feeder conveyor and said forming conveyor.

14. Apparatus for conveying pourable particle stock, such as wood shavings, into a body of uniform particle distribution, comprising stock supply means, a twin arrangement of two endless feeder conveyors disposed horizontally side by side below said supply means to receive particle stock from said supply means, said feeder conveyors having respective outwardly directed conveying paths and having respective discharge places at the outer ends of said paths, two endless-belt scrapers each being disposed above one of said respective feeder conveyors and extending from said feeder conveyor upwardly and inwardly at an acute angle, control means disposed between said supply means and said twin arrangement of feeder conveyors and selectively adjustable for directing the particle stock from said supply means onto either feeder conveyor, and a forming conveyor extending below said twin arrangement in parallel relation to said feeder conveyors to receive particle stock from both said feeder conveyors.

15. Apparatus according to claim 14, comprising a plurality of condition-responsive sensing members located above said two feeder conveyors near said respective scrapers and connected with said control means for controlling said latter means in dependence upon the respective heights of the stock located on said feeder conveyors in front of said scrapers.

16. In apparatus according to claim 14, said stock supply means comprising a selectively adjustable device for directing the stock being supplied onto either one of said twin feeder conveyors, a plurality of sensing members disposed above each of said two feeder conveyors, and control means including said sensing members and connected with said stock supply means for causing said adjustable device to direct the supply of stock to the other feeder conveyor when the amount of stock on one feeder conveyor reaches a given height and stopping the supply when the amounts of stock on both feeder conveyors reach said height.

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