Nov. 26, 1963 F. E. DEEMS 3,111,892

PNEUMATIC FEED MEANS FOR FIBER PRESS

Filed Aug. 11, 1961

FIG-1

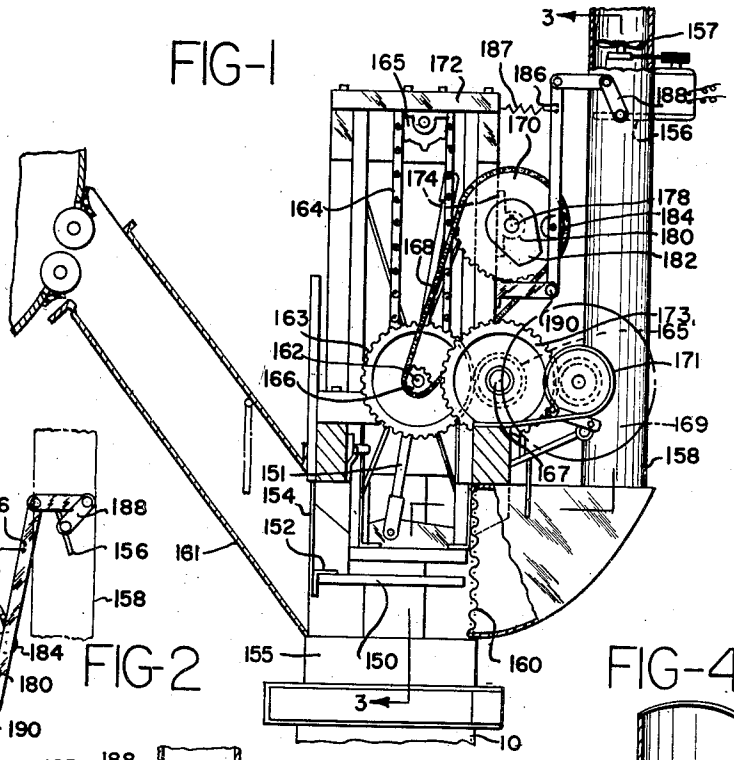


FIG-2

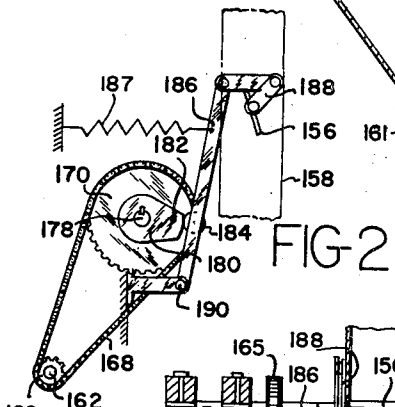
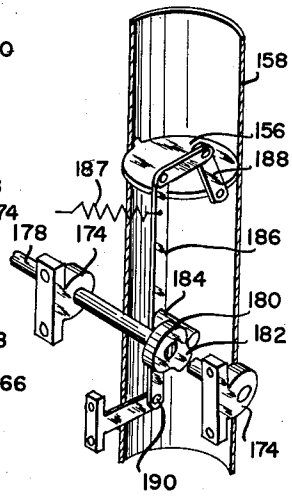


FIG-4



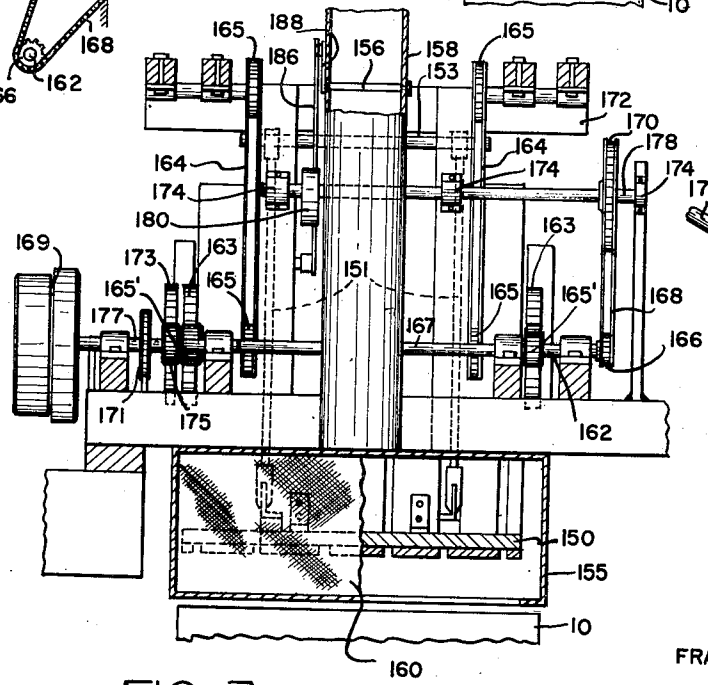


FIG-3

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PNEUMATIC FEED MEANS FOR FIBER PRESS

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This invention relates to fiber feeding means and is particularly concerned with a pneumatic feeding means for conveying fibers to a fiber press or baler.

This application is a continuation-in-part of my copending application, Serial No. 45,056, filed July 25, 1960, and also entitled: Pneumatic Feed Means for Fiber Press, now Patent No. 3,025,785.

In the baling or pressing of fibers, such as cotton fibers into bales, one of the important steps to be carried out is the conveying of the fibers into baling position. This movement of the fibers must be carried out rapidly in order to prevent the loss of time and, also, substantially uniform distribution of the fibers in the baling chamber is necessary in order to be able to produce bales of uniform density and which are square on the end so that they can easily be handled.

Heretofore, expensive complex mechanical arrangements have been provided for delivering fibers into the baling chamber but these arrangements have the objection, in addition to being expensive and complicated that they require considerable service to maintain them in good operating condition.

Such mechanical fiber handling devices also tend to break fibers and to cause them to become entangled.

Other mechanical lint feeders employ brushes or revolving sweeps to urge the fibers, such as cotton lint into the baling hopper. The tendency of an arrangement of this nature is to tumble the fibers and to beat them into a frothy mass which will interfere with the baling operation and which is also harmful to the fibers.

None of the heretofore known devices have had the advantage of giving a uniform filling of the baling hopper to produce uniform regularly shaped bales.

The present invention proposes to utilize air for moving the fibers to and into a press box so that the fibers will be uniformly distributed in the box and will be conveyed thereto quickly without in any way damaging the fibers.

The use of air in this general connection has been known heretofore but none of the previous devices have operated substantially quickly or reliably enough to be practical and, accordingly, commercial units of this nature have never become popular.

With the foregoing in mind, it is a primary object of the present invention to provide an apparatus for baling fibers, such as lint cotton which is more rapid than heretofore known apparatus.

A still further object of the invention is the provision of a fiber conveying device, particularly for fiber baling machines which is highly adaptable and which can be fitted to substantially all existing press types with only minor modification.

A still further object of this invention is the provision of an apparatus for feeding fibers, particularly to fiber presses, which will handle the most delicate fibers without damagaing the fibers in any way.

Still a further object of this invention is the provision of a fiber feeding device which utilizes air as a conveying medium but which will operate on low air volumes and low pressures.

It is also a still further object of this invention to provide an apparatus for drawing fibers and particularly lint cotton into a press box without disturbing the fibers while

simultaneously extracting from the lint a considerable portion of the fine dirt and trash particles therein.

The foregoing objects as well as other objects and advantages of this invention will become more apparent upon reference to the following specification taken in connection with the accompanying drawings in which:

FIGURE 1 is a diagrammatic view showing a baler having means for mechanically operating the air control damper and gate; FIGURE 2 is a fragmentary view showing the damper control mechanism of FIGURE 1 in a different position; FIGURE 3 is a view looking in from the right side of FIGURE 1 structure, partly in section, and is generally indicated by line 3—3 on FIGURE 1; and, FIGURE 4 is a fragmentary perspective view showing the damper operating mechanism of FIGURE 1.

Referring to the drawings somewhat more in detail, FIGURE 1 shows, somewhat diagrammatically, a fiber press or tramper having a press box 10 in which fibers, such as lint cotton are to be compacted by a follower block or tramping block 150. The follower block 150 is guided for vertical reciprocating movement and has connected thereto a link means 151 that extends to a cross bar 153 connected with drive chains 164. The drive chains 164 are carried on sprockets 165 and the lower ones of these sprockets are mounted on shafts 162. Each shaft 162 has mounted thereon a drive gear 163 and these drive gears mesh with driving pinions 165' arranged on a shaft 167 extending transversely of the press. Shaft 167 at one end carries gear 173 that is driven by pinion 175 fixed to short shaft 177. Shaft 177 is driven in rotation by pulley means 169 thereon and pertaining to shaft means 177 is selectively operable braking mechanism 171.

At one side of the machine one of the shafts 162 carries a sprocket 166 connected by a chain 168 with a larger sprocket 170 mounted on a shaft 178. Shaft 178 is rotatably supported in bearings 174 attached to the frame of the baler. On shaft 178 is a cam 180, and this cam has a lobe portion at 182, as will be seen in FIGURES 1, 3 and 4. This lobe portion cooperates with roller means 184 mounted on damper actuating shaft 186 that is spring urged toward the cam by tension spring means 187.

Lever 185 is pivotally supported at 190 on the machine frame and is connected with the actuating lever 188 of damper member 156 for selectively opening and closing the damper, thereby to selectively subject conduit 158 leading to a screened opening 160 to the influence of suction from fan 157, or to eliminate the suction influence from the said conduit.

Screened opening 160 is located in the one wall of the press directly opposite the connection thereto of a downwardly inclined chute 161 through which fibers will slide that are to be baled. Chute 161 where it opens into the press or hopper, identified by reference numeral 155, is adapted for being closed by a vertically reciprocable gate 154 which will move downwardly by gravity. This gate has an angle clip 152 connected thereto adapted for abuttingly engaging the top of tramping block 150, so that when the tramping block moves upwardly the gate is lifted to release fibers from the chute into the hopper. The gate 154 thus opens simultaneously with the retraction of the tramping block and closes by gravity concurrently with the advancing movement of the tramping block downwardly and into the press box after the gate has been closed and is halted.

The ratio of sprocket 166 to sprocket 170 is about four to one, so that the shaft 178 on which cam 180 is mounted will make exactly one revolution for each complete cycle of tramping block 150.

In operation, fibers will slide to chute 161 and slide down the chute and are stopped by gate 154 when tramp-

ing block **150** is in a lowered position. If the tramping block is in a lowered position, the damper **156** is also closed so that no air is drawn through the screened opening **160**.

Upon retraction of the tramping block **150**, however, gate **154** is lifted by abutment of the upwardly moving tramping block with clip **152** so that the fibers are released from the chute for movement into hopper **155**.

As the tramping block approaches its uppermost position, cam **180** will actuate lever **186** and open damper **156**, and this will cause air to flow through the chute and transversely across the hopper into screened opening **160**, the air carrying with it fibers from the chute and conveying them into the hopper. When the tramping block then moves downwardly, damper **156** will close, due to spring **187**, thus interrupting the flow of air from the chute into the hopper, and the gate **154** will also be lowered so that a charge of fibers drawn into the hopper can now be compressed in baling chamber **10**. The foregoing cycle obtains repetitively thereby to build up a bale of the desired size.

The described arrangement has the particular advantage of permitting existing baler, including relatively old balers to be modified and obtain the advantage of the rapid fiber feeding according to the present invention.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions; and accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

I claim:

1. In a fiber feeding arrangement; a vertical hopper, a chute having a top wall and connected to one side of the hopper and leading upwardly therefrom at an angle, means for supplying fibers to the chute at the end thereof opposite the hopper, air inlet means in the top wall of the chute adjacent the point of supply of fibers thereto, there being a screened outlet opening in the side wall of the hopper opposite the point of connection of the chute to the hopper, a source of suction, a duct connected to said screened opening, and leading to said source of suction, a damper in said duct, a gate movable for closing the hopper end of the chute, a tramping block vertically reciprocable in the hopper for compacting fibers delivered thereto, means for reciprocating the tramping block in the hopper, an abutting connection between the tramping block and the gate so the gate closes upon downward movement of the tramping block and is opened by upward movement thereof, a lever connected to the damper to move it between its open and closed position, spring means biasing said damper toward closed position, a cam operatively associated with said lever and operative during one revolution to move the lever in a direction to open the damper and then to release the lever to permit the spring means to close the damper, a shaft supporting the cam, and means drivingly connecting the shaft to the tramping block for one complete revolution of the shaft and cam for one complete cycle of the tramping block.

2. In a fiber feeding arrangement; a vertical hopper, a tramping block reciprocable through said hopper from a retracted position above the hopper downwardly through the hopper and then upwardly again, a chute having bottom, top, and side walls and connected to one side of the hopper and leading upwardly therefrom at an angle, means for supplying fibers to the chute at the end thereof opposite the hopper, there being a screened outlet opening in the side wall of the hopper opposite said one side and substantially directly opposite the hopper end of the chute, a source of suction, a duct connecting said source of suction with said outlet opening, a damper in said duct, spring means urging said damper toward closed position, a gate on said one side of the hopper vertically movable by gravity for closing the hopper end of the chute, drive means leading to said tramping block for causing the said reciprocation thereof and including a rotating shaft, means driven by said shaft and operatively associated with said damper for moving the damper from its closed to its open position during the final portion of the upward movement of the tramping block, and means on said gate adapted to be abuttingly engaged by said tramping block during upward movement thereof whereby said gate is lifted into open position and permitted to gravitate to its closed position upon downward movement of said tramping block.

3. In a fiber feeding arrangement; a vertical hopper, a tramping block reciprocable through said hopper from a retracted position above the hopper downwardly through the hopper and then upwardly again, a chute having a top wall and connected to one side of the hopper and leading upwardly therefrom at an angle, means for supplying fibers to the chute at the end thereof opposite the hopper, there being a screened outlet opening in the side wall of the hopper opposite the hopper end of the chute, a source of suction, a duct connected to said screened opening, and leading to said source of suction, a damper in said duct, a gate movable for closing the hopper end of the chute, drive means leading to said tramping block for causing the reciprocation thereof and including a rotating shaft, an operating lever connected to said damper, and means drivingly connected to said shaft for actuating said lever to bring about movement of said damper in its opening and closing directions in timed relation to the reciprocation of said tramping block, there also being means operable in timed relation to the movement of said tramping block for causing opening of said gate and for releasing said gate for permitting closing movement of said gate.

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