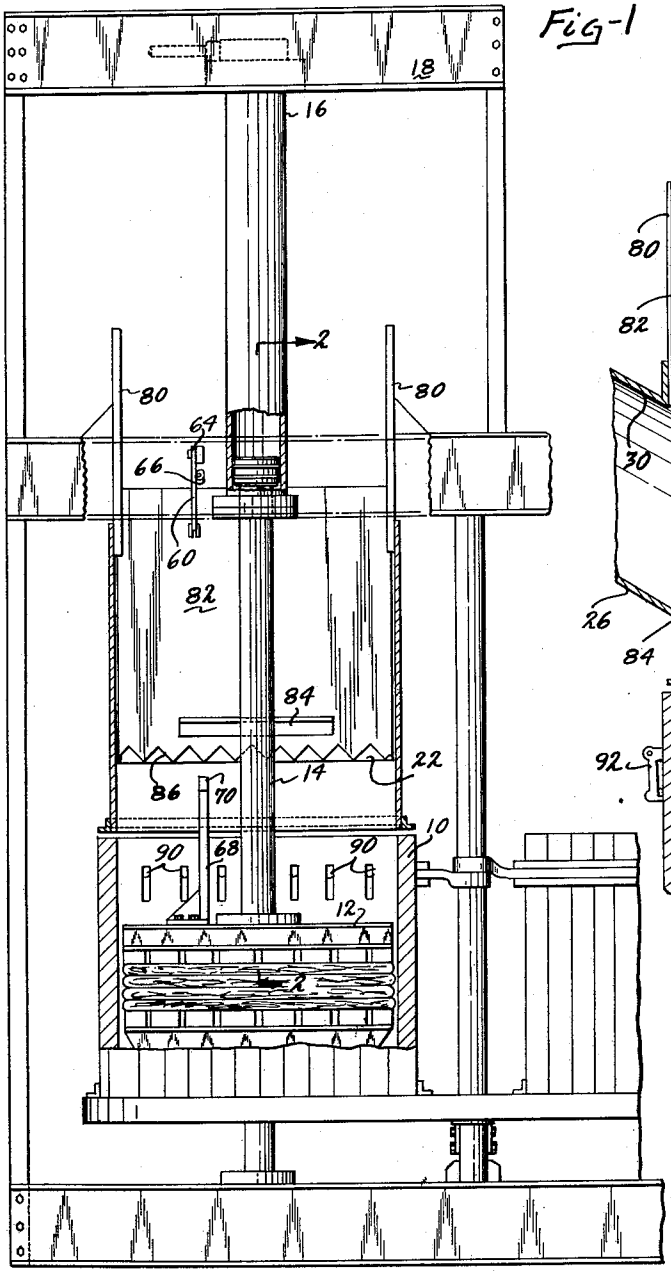
March 20, 1962 F. E. DEEMS 3,025,785

PNEUMATIC FEED MEANS FOR FIBER PRESS

Filed July 25, 1960 2 Sheets-Sheet 1

Fig-1



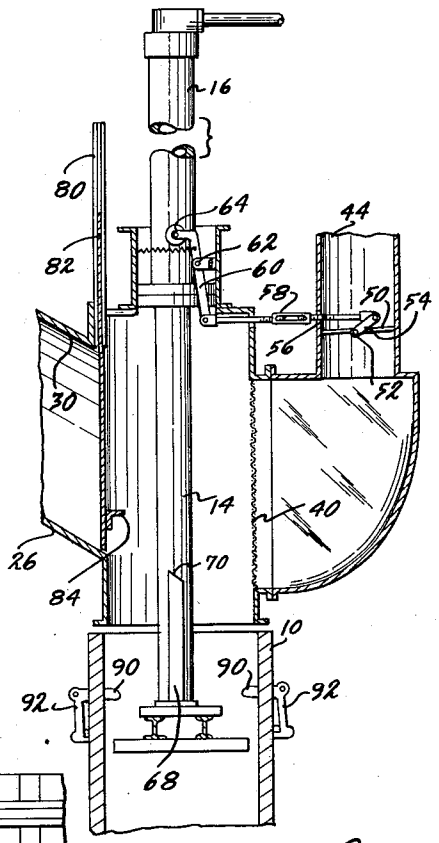


Fig-2

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PNEUMATIC FEED MEANS FOR FIBER PRESS

Filed July 25, 1960 2 Sheets-Sheet 2

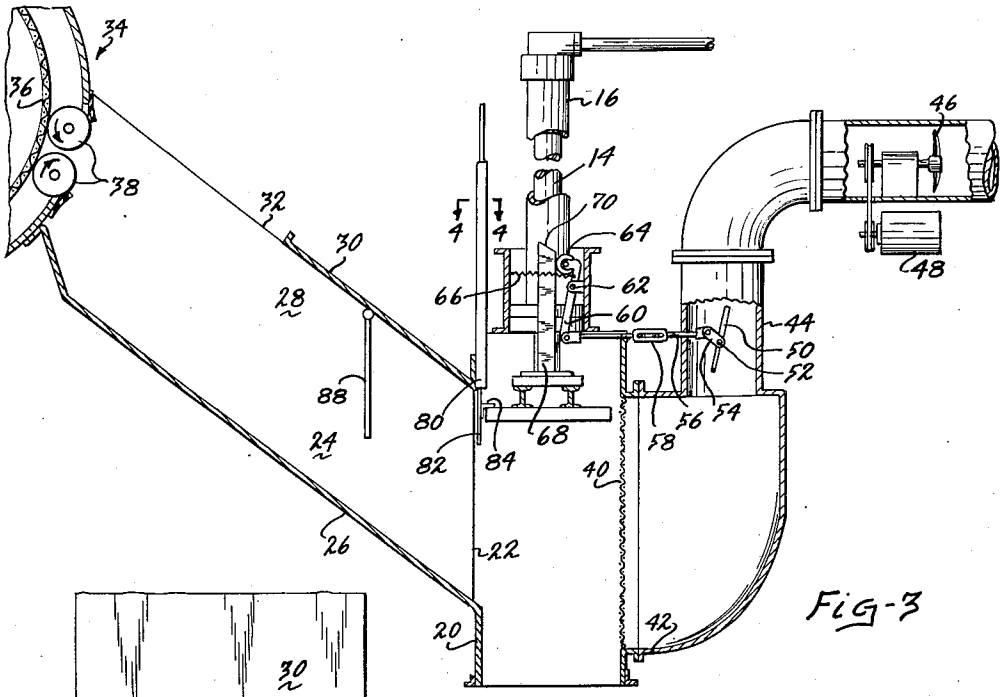


Fig-3

Fig-4

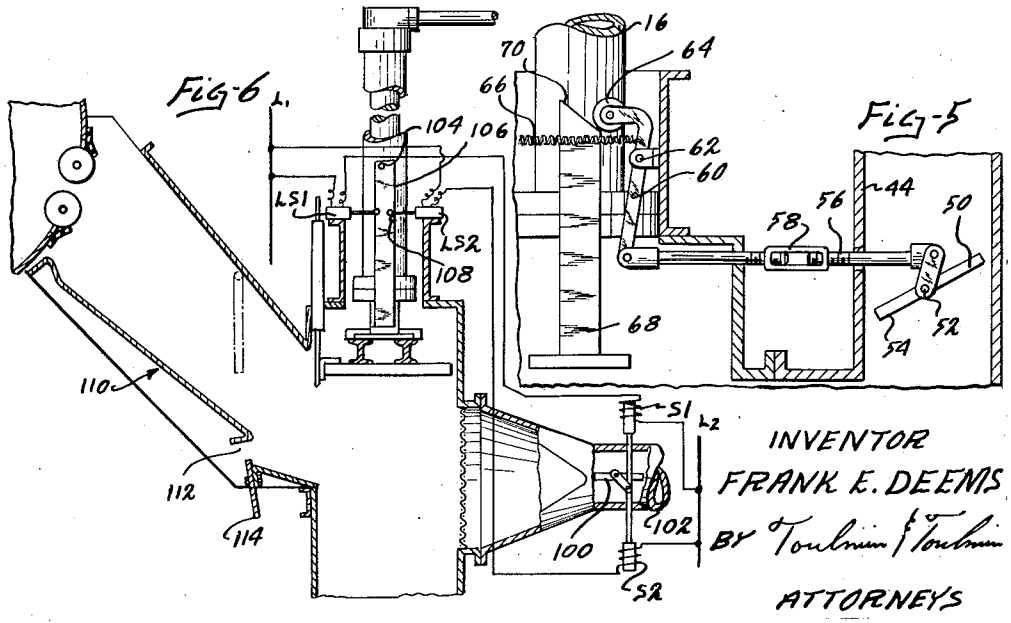


Fig-6

Fig-5

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United States Patent Office 3,025,785 Patented Mar. 20, 1962

3,025,785

PNEUMATIC FEED MEANS FOR FIBER PRESS

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Filed July 25, 1960, Ser. No. 45,056
14 Claims. (Cl. 100—90)

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.

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 damaging 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 view, particularly in section of a fiber press having a feed means according to this invention associated therewith,

FIGURE 2 is a vertical sectional view indicated by line 2—2 on FIGURE 1,

FIGURE 3 is a view similar to FIGURE 2 but shows the follower block retracted and also shows the condenser which supplies lint cotton to the hopper of the press and the arrangement for withdrawing air from the hopper,

FIGURE 4 is a plan sectional view indicated by line 4—4 on FIGURE 3 showing the guides for a sliding gate forming a part of the structure,

FIGURE 5 is a vertical view drawn at enlarged scale showing more in detail a valve operating mechanism associated with the follower block, and

FIGURE 6 is a sectional view similar to FIGURE 3 showing a modified arrangement for operating the exhaust duct valve and also showing an auxiliary air inlet.

Referring to the drawings somewhat in more detail, FIGURE 1 shows, somewhat diagrammatically, a fiber press or tramper having a press box **10** in which fibers, such as lint cotton, are compacted by a follower block **12** mounted on a ram **14** extending into a cylinder **16** that is carried in the tramper frame **18**. Reversible energization of the motor made up by ram **14** and cylinder **16** will move the follower block in reciprocation and, by supplying fiber to the press box, a bale will be built up therein.

Referring now to FIGURES 2 through 5, it will be seen that the press box **10** has positioned immediately thereover a tramping hopper **20** which has an inlet opening **22** on one side that connects with lint chute **24**. Lint chute **24** has a continuous bottom sheet **26**, side walls **28**, and a top wall made up of the cover sheet or sheets **30** which top wall is abbreviated to leave space for an air opening **32** in the top of the lint chute opposite the opening **22**. At its upper end lint chute **24** is connected to the housing of a condenser **34** in which there is rotatably mounted the foraminous condenser drum **36**. In a manner well known in the art, fibers, such as cotton lint, are accumulated on the condenser roll and as the roll rotates, the fibers will be removed therefrom by the doffing rollers **38** and delivered to lint chute **24**.

The side of the tramping hopper opposite the inlet opening **22** is provided with a screen **40** and attached to the hopper on the outside of screen **40** is an outlet hood or transition piece **42** that connects with an outlet duct **44** in which there is mounted a suction fan **46** having a drive motor **48**.

Duct **44**, upstream of suction fan **46** has a damper or valve **50** fixed to a rotatable shaft **52** that has attached thereto an operating arm **54** connected with a link **56** that is adjustable in length by the turnbuckle **58** included therein.

The end of link **56** opposite arm **54** is connected to one end of a lever **60** pivoted to the frame of the machine at **62** and having a roller **64** on its end opposite its connection with link **56**. A spring **66** connected between the frame of the tramper and the roller end of lever **60** continuously urges the lever in a direction to close valve **50**. For opening valve **50** there is fixed to the follower block a cam bar **68** having an inclined upper face **70** adapted for engaging roller **64** as the follower block approaches its retracted position and actuating lever **60** to open valve **50**. It will be apparent at this time that the cam bar will release lever **60** after a predetermined downward or advancing movement of the follower block thus permitting the valve **50** to close and to remain closed during the major portion of the advancing and retracting movement of the follower block.

The tramper frame, adjacent the inlet opening 22 is provided with spaced guide channels 80 in which is slidably mounted a gate or lint stop 82. This gate or lint stop is connected with the follower block by an angle leg 84 so as to move vertically therewith. When the follower block is in its advanced position, the said gate is stopped by the bottom edge of the inlet and when the follower block retracts, it picks the gate up and again opens the inlet.

As will be seen in FIGURE 1, the lower edge of the gate has a serrated configuration 86 which it is found is of benefit in separating the lint in the tramping chamber from lint remaining in the lint chute.

In the lint chute pivotally dependent from cover sheet 30 is a plate or gate 88 which extends downwardly about two-thirds the distance toward the bottom of the lint chute and which is swingable toward the tramping hopper. This plate is effective for restricting air flow through the lint chute to the lower portion thereof while being substantially freely swingable toward the tramping hopper while large quantities of lint are passing through the lint chute.

In operation, with suction fan 46 operating, and with condenser 34 supplying fibers, such as lint cotton, to the lint chute 24, the lint cotton will be drawn quickly into the tramping hopper 20 by the flow of air inwardly through air inlet 32 and thence through lint chute 24 and under plate 88 and through inlet 22 and across the tramping hopper and out screen 40. The lint will be quickly drawn into the tramping hopper with the plate 88 preventing the air passing idly over the lint while simultaneously any fine particles of dirt or trash in the lint will be drawn therefrom by the air stream and passed out the outlet duct.

The motor for the tramping block is arranged to cycle periodically and upon initiation of the downward movement, it will release valve 50 which will immediately close and cut off the suction to the tramping hopper. This will release the lint that is drawn against screen 40 so that the lint will be released into the tramping hopper and will drop into the press box and will be compacted therein by the advancing movement of the follower block. The gate 82 follows the follower block downwardly and stops the lint from moving from the lint chute into the hopper. This lint will accumulate in the lint chute until the follower block is again retracted and lifts gate 82 and opens valve 50.

The advancing movement of the follower block is such that it passes downwardly beyond the inwardly extending arms 90 of the dogs 92 that are pivoted to the sides of the press box. This dog arrangement retains the lint in compacted condition in the press box.

From the foregoing it will be seen that the delivery of lint to the tramping hopper is extremely rapid whereby rapid cycling of the follower block can be had. The lint is uniformly distributed over the hopper and, therefore, over the press box so that uniform regular bales are produced. The fine particles of dirt and trash in the lint are drawn therefrom through screen 40 by the air stream into duct 44. Gate 88 assures that the air will pass through the lint and, by being pivotally supported, will also permit large quantities of lint to move down the lint chute substantially without obstruction.

In the modification of FIGURE 6, a substantially identical arrangement is illustrated except that the valve 100 in the outlet duct 102 is provided with a solenoid operator S1 for closing the valve and a solenoid operator S2 for opening the valve.

Solenoid S1 is in circuit with a limit switch LS1 adapted for being closed by cam 104 on cam bar 106 when the follower block reaches a predetermined advanced position, thus closing the valve in the same manner as valve 50 of the previously described modification was closed. Solenoid S2 is in circuit with the limit switch LS2 adapted for being closed by cam 108 on cam bar 106 as the follower block approaches its retracted position whereupon the valve 100 is opened in about the same manner as described in connection with the opening of valve 50 of the first described modification.

The lint chute 110 in the FIGURE 6 modification is provided with an auxiliary air inlet 112 toward the bottom that is adjustable in effective area by adjustable gate 114. This provision of additional air through the bottom chute will provide some lift to the lint as it is drawn into the tramping hopper. This will assist in getting the lint into the hopper quickly and in distributing the lint in the hopper. In all other respects, the modification of FIGURE 6 is the same as the modification of FIGURES 1 through 5.

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 connected to one side of the hopper and leading upwardly therefrom at an angle, means at the end of the chute opposite the hopper for supplying fibers thereto, said chute having side, bottom, and top walls and said top wall having an air inlet opening therein adjacent the end opposite the hopper, there being a screened outlet in the hopper on the side thereof opposite the connection thereof with said chute and in about the same horizontal plane as said connection, a duct leading from said screened outlet and a fan in the duct operable to induce air flow into said air inlet and through the chute and hopper and the screened outlet to draw fibers from the chute into the hopper, a tramping block reciprocably mounted in said hopper, and means responsive to downward movement of the tramping block for closing the chute at the hopper end and for interrupting the flow of air through said screened outlet for transferring the fibers in the hopper to a work station.

2. In a fiber feeding arrangement; a hopper, a chute connected to one side of the hopper and leading upwardly therefrom at an angle, means at the end of the chute opposite the hopper for supplying fibers thereto, said chute having side, bottom, and top walls and said top wall having an air inlet opening therein adjacent the end opopsite the hopper, there being a screened outlet in the hopper opposite the connection thereof with said chute, a duct leading from said screened outlet and a fan therein operable to induce air flow into said air inlet and through the chute and hopper and the screened outlet to draw fibers from the chute into the hopper, a tramping block reciprocably mounted in said hopper, a slidable gate movable for closing the chute at the hopper end to interrupt the supply of fibers to the hopper, and a damper valve in said duct closeable to interrupt the flow of air therethrough to release fibers drawn against the screened outlet so they will drop into the hopper, said gate and damper valve being opened by the tramping block during upward movement thereof and closed by the tramping block during downward movement thereof.

3. In combination; a fiber press comprising a press box and a tramping block reciprocable into the press box from above, a hopper above the press box and through which the tramping block reciprocates, there being an inlet opening at one side of the hopper, a lint supply chute leading upwardly away from the hopper and attached thereto at said inlet opening, there being a screened outlet opening in the opposite side of the hopper, an outlet duct leading from said outlet opening and having a damper therein, a suction fan connected to said duct on the side of the damper opposite said hopper to draw air from the hopper into the duct, a slidable gate adjacent said inlet opening for closing the opening to interrupt the supply of fibers to the hopper, means operated by the tramping block upon retraction thereof for opening said gate and also for opening said damper whereby the sup-

ply of air through the chute and hopper and out the outlet opening and the duct leading therefrom will draw fibers into the hopper, and means operated by the advancing movement of said tramping block for closing said damper and also for closing said gate.

4. In combination; a fiber press comprising a press box and a tramping block reciprocable into the press box from above, a hopper above the press box and through which the tramping block reciprocates, there being an inlet opening at one side of the hopper, a lint supply chute leading upwardly away from the hopper and attached thereto at said inlet opening, there being a screened outlet opening in the opposite side of the hopper, an outlet duct leading from said outlet opening and having a damper therein, a suction fan connected to said duct on the side of the damper opposite said hopper to draw air from the hopper into the duct, a slidable gate adjacent said inlet opening for closing the opening to interrupt the supply of fibers to the hopper, means operated by the tramping block upon retraction thereof for opening said gate and also for opening said damper whereby the supply of air through the chute and hopper and out the outlet opening and the duct leading therefrom will draw fibers into the hopper, and means operated by the advancing movement of said tramping block for closing said damper and also for closing said gate, said chute having bottom, top and side walls, an air inlet opening in the top wall of the chute remote from the connection of the chute with the hopper, and a baffle member in the chute between the ends thereof and pivotally suspended from the top wall thereof and extending downwardly toward but terminating short of the bottom wall thereof.

5. In combination; a fiber press comprising a press box and a tramping block reciprocable into the box from above, a hopper above the box through which the tramping block reciprocates, there being an inlet opening for lint in one side of the hopper, a chute connected with said inlet opening extending upwardly at an angle from the hopper, there being a screened air outlet opening in the opposite side of the hopper and a discharge duct connected thereto and leading from the hopper, means responsive to a predetermined retracting movement of said tramping block from the press box for initiating the movement of air in said discharge duct away from said hopper thereby to draw fibers from the chute into the hopper and said means also being responsive to a predetermined advancing movement of said tramping block for interrupting the said movement of air, and a gate slidably supported adjacent said inlet into the hopper connected with the tramping block for movement therewith into position to close said inlet opening.

6. In combination; a fiber press comprising a press box and a tramping block reciprocable into the box from above, a hopper above the box through which the tramping block reciprocates, there being an inlet opening for lint in one side of the hopper, a chute connected with said inlet opening extending upwardly at an angle from the hopper, there being a screened air outlet opening in the opposite side of the hopper and a discharge duct connected thereto and leading from the hopper, means responsive to a predetermined retracting movement of said tramping block from the press box for initiating the movement of air in said discharge duct away from said hopper thereby to draw fibers from the chute into the hopper and said means also being responsive to a predetermined advancing movement of said tramping block for interrupting the said movement of air, and a gate slidably supported adjacent said inlet into the hopper connected with the tramping block for movement therewith into position to close said inlet opening, said tramping block moving beyond the position where the said gate comes to a halt in closing relation to said inlet opening, and the lower edge of said gate being serrated to facilitate separation of the body of fibers being moved by the tramping block from the body of fibers in said chute.

7. In combination; a fiber press comprising a press box and a tramping block reciprocable into the box from above, a hopper above the box through which the tramping block reciprocates, there being an inlet opening for lint in one side of the hopper, a chute connected with said inlet opening extending upwardly at an angle from the hopper, there being a screened air outlet opening in the opposite side of the hopper and a discharge duct connected thereto and leading from the hopper, means responsive to a predetermined retracting movement of said tramping block from the press box for initiating the movement of air in said discharge duct away from said hopper thereby to draw fibers from the chute into the hopper and said means also being responsive to a predetermined advancing movement of said tramping block for interrupting the said movement of air, and a gate slidably supported adjacent said inlet into the hopper connected with the tramping block for movement therewith into position to close said inlet opening, said means for interrupting and initiating the movement of air through said duct comprising mechanically operable means, and cam and follower means carried by said tramping block and said mechanical means for operating the latter in response to movement of said tramping block.

8. In a fiber feeding arrangement; a hopper, a chute leading downwardly on an incline to the hopper on one side, there being a screened air outlet in the hopper on the side opposite the chute, a tramping block reciprocable through said hopper, means for supplying fibers to the chute at the end thereof opposite the hopper, there being an air inlet in the chute adjacent the point of supply of fibers thereto, gate means for closing the hopper end of the chute, means for drawing air from the hopper through said screened outlet to cause air to move into said air inlet and along said chute to draw fibers from the chute into the hopper, and means responsive to reciprocation of said tramping block operable for controlling the opening and closing of said gate means and for controlling said means for drawing air from the hopper through said screened outlet.

9. In a fiber feeding arrangement; a hopper, a chute connected to the hopper on one side and leading upwardly at an angle therefrom, means for supplying fibers to the chute at the end thereof opposite the hopper, said chute having a top wall and there being an air inlet in the top wall of the chute adjacent the point of supply of fibers thereto, a gate slidably mounted at the hopper end of said chute, there being a screened outlet in the wall of the hopper on the side opposite the chute, conduit means connected to said screened outlet, suction means pertaining to said conduit means for drawing air through said screened outlet to draw fibers from the chute into the hopper, a tramping block reciprocable through said hopper past the end of the chute, and means responsive to reciprocation of said tramping block for closing said gate and for interrupting the flow of air through said conduit means on the downward stroke of said tramping block.

10. In combination; a fiber press comprising a press box and a tramping block reciprocable into the press box from above, a hopper above the press box and through which the tramping block reciprocates, there being an inlet opening at one side of the hopper, a lint supply chute leading upwardly away from the hopper and attached thereto at said inlet opening, there being a screened outlet opening in the opposite side of the hopper, an outlet duct leading from said outlet opening and having a damper therein, means on the opposite side of the damper from said hopper for drawing air through said duct from said hopper, a slidable gate adjacent said inlet opening for closing the opening to interrupt the supply of fibers to the hopper, control means operated by the tramping block upon retraction thereof for opening said gate and also for opening said damper whereby the supply of air through the chute and hopper and out the outlet opening and the duct leading therefrom will draw fibers into the hopper

and said control means being operated by the advancing movement of said tramping block for closing said damper and also for closing said gate, said chute having a top wall, and there being a baffle member in the chute between the ends thereof pivotally suspended from said top wall and extending transversely of the chute and part way from the top wall to the bottom of the chute.

11. In combination; a fiber press comprising a press box and a tramping block reciprocable into the press box from above, a hopper above the press box and through which the tramping block reciprocates, there being an inlet opening at one side of the hopper, a lint supply chute leading upwardly away from the hopper and attached thereto at said inlet opening, there being a screened outlet opening in the opposite side of the hopper, an outlet duct leading from said outlet opening and having a damper therein, means on the opposite side of the damper from said hopper for drawing air through said duct from said hopper, a slidable gate adjacent said inlet opening for closing the opening to interrupt the supply of fibers to the hopper, control means operated by the tramping block upon retraction thereof for opening said gate and also for opening said damper whereby the supply of air through the chute and hopper and out the outlet opening and the duct leading therefrom will draw fibers into the hopper, and said control means being operated by the advancing movement of said tramping block for closing said damper and also for closing said gate, said chute having an auxiliary air inlet opening therein in the bottom adjacent the connection of the chute with the hopper to admit a "lifting" supply of air into the chute to impart to the lint a tendency to float across the width of the hopper.

12. In combination; a fiber press comprising a press box and a tramping block reciprocable into the box from above, a hopper above the box through which the tramping block reciprocates, there being an inlet opening for lint in one side of the hopper, a chute connected with said inlet opening extending upwardly at an angle from the hopper, there being a screened air outlet opening in the opposite side of the hopper and a discharge duct connected thereto and leading from the hopper, a damper in said duct, a suction fan connected to said duct on the side of the damper opposite said hopper to draw air from the hopper into the duct, means responsive to movement of said tramping block for opening said damper as the tramping block approaches its fully retracted position and for closing said damper a predetermined time after the tramping block commences its advancing movement, the opening of said damper initiating the movement of air in said hopper thereby to draw fibers from the chute into the hopper, and a gate slidably supported adjacent said inlet into the hopper connected with the tramping block for movement therewith into position to close said inlet opening.

13. A fiber feeding arrangement according to claim 9 in which the said means responsive to reciprocation of said tramping block and operable for controlling the said means for drawing air from the hopper through said screened outlet comprises a damper means in asid conduit means between the said suction means and said screened outlet, electric operators associated with said damper means selectively energizable for moving the damper means between open and closed positions, and switches in circuit with said electric operators positioned for operation by said tramping block as said tramping block reciprocates.

14. A fiber feeding arrangement according to claim 9 in which the said means responsive to reciprocation of said tramping block and operable for controlling the said means for drawing air from the hopper through said screened outlet comprises a damper means in said conduit means between the said suction means and said screened outlet, electric operators associated with said damper means selectively energizable for moving the damper means between open and closed positions, switches in circuit with said operators, and switch actuating means carried by said tramping block for actuating said switches as the tramping block reciprocates for effecting the interruption of the flow of air through said conduit means on the downward stroke of said tramping block and for again initiating the flow of air through said conduit means on the upward stroke of said tramping block.

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