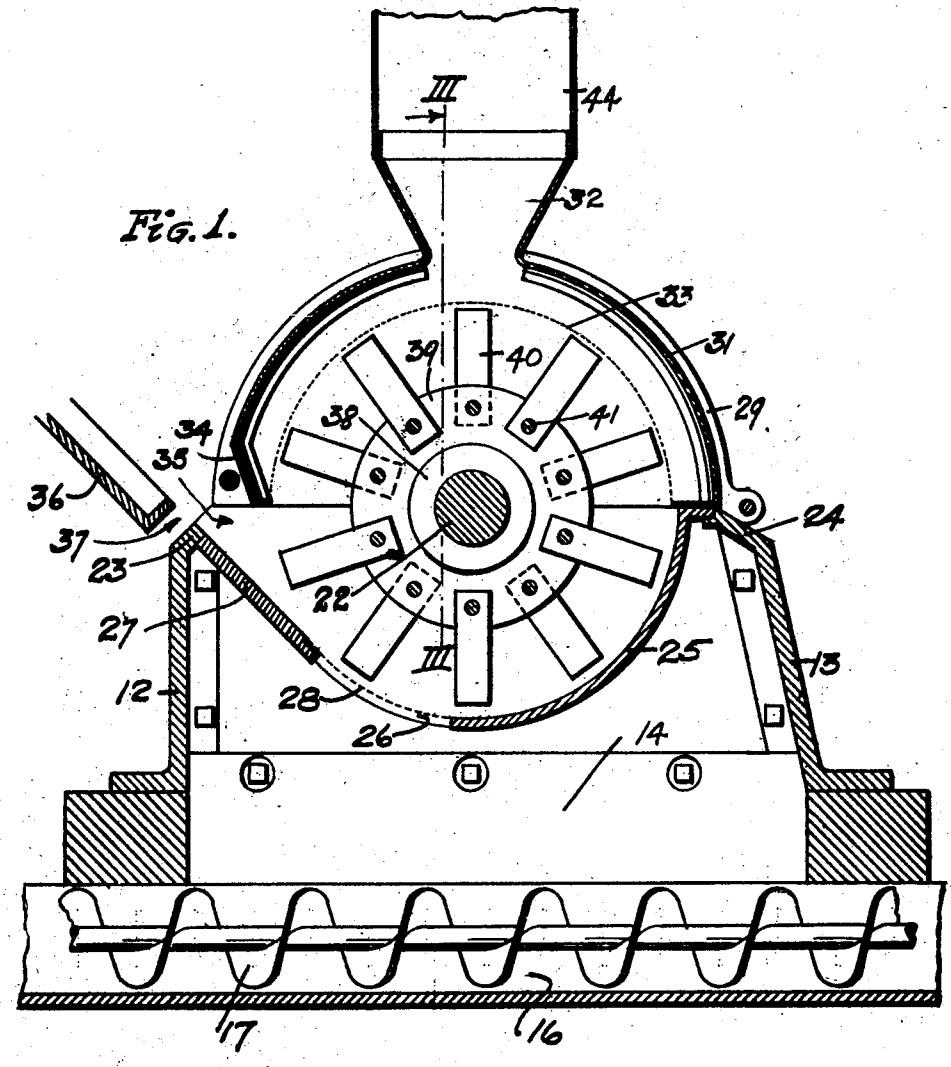
April 12, 1927. J. E. REDUS 1,624,435

DELINTER

Filed Nov. 29, 1926 2 Sheets-Sheet 1

Fig. 1.



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April 12, 1927. J. E. REDUS 1,624,435

DELINTER

Filed Nov. 23, 1926 2 Sheets-Sheet 2

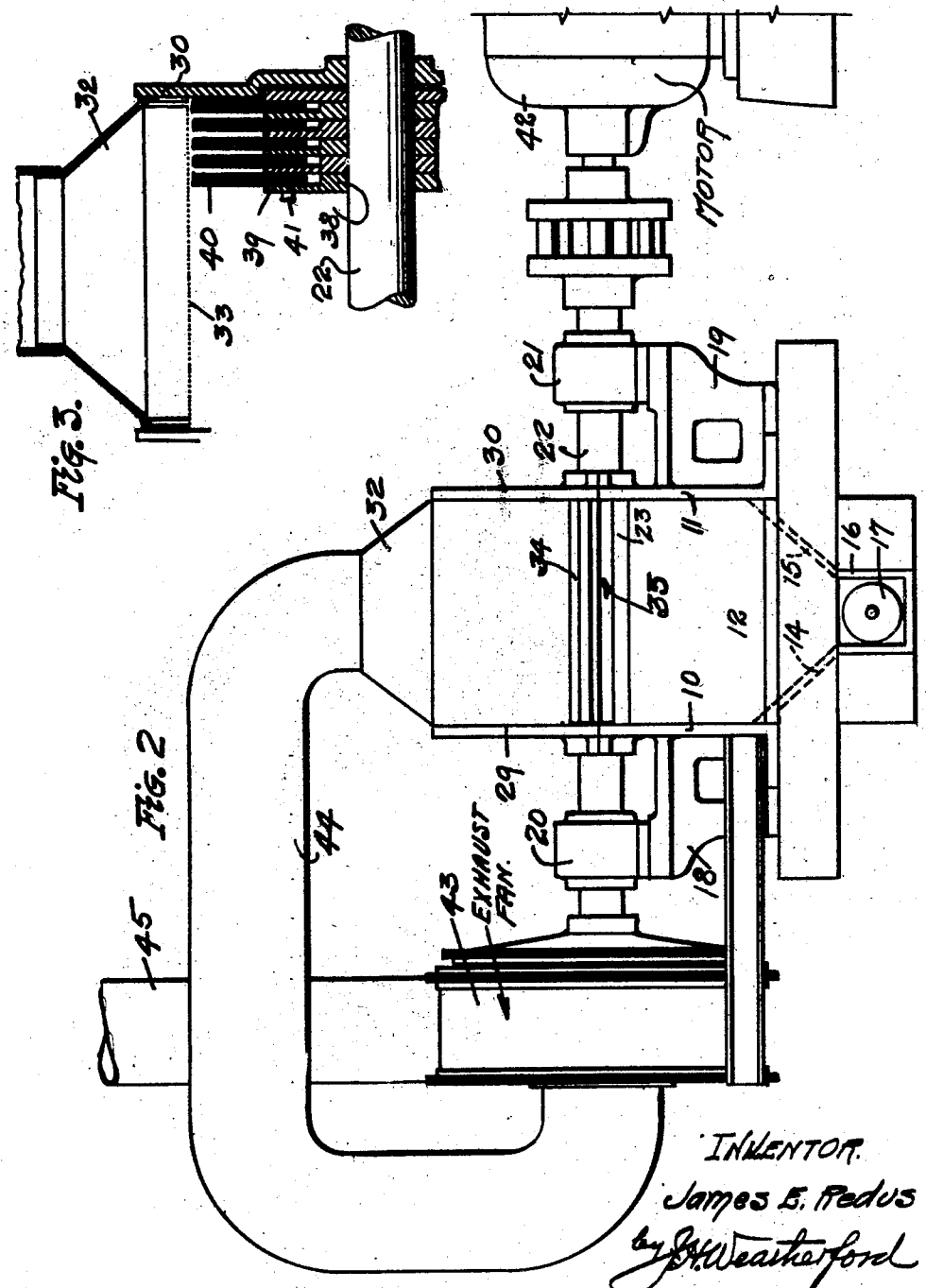


Fig. 2

Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES E. REDUS, OF MEMPHIS, TENNESSEE.

DELINTER.

Application filed November 29, 1926. Serial No. 151,312.

This invention relates to improvements in means and methods for delinting fibre-covered seed hulls and especially to means and methods for removing the lint from cotton-seed hulls.

After cotton seed hulls have been ground and the meats removed therefrom, there yet remains a certain amount of short lint clinging to the hulls and certain portions of the meats remaining in the hulls. The lint thus remaining is of value provided it is separated from the hulls and meats, and these latter are also of value and can be improved in quality by the removal of the lint. The separation of the lint from these other materials, which because of the large proportion of hulls to meats are known by the single term "hulls" has become in itself an industry of no small moment, and is the operation in which my machine and process is used. By reason of the fact that all lint of such length as to be worthy the designation fiber, has already been removed before the seed are ground, the lint which it is my purpose to remove is extremely short and light and well lends itself to removal in an upward direction by means of an upwardly flowing air current and also by reason of its limited size easily passes through openings which are too small for the particles of hull to pass, even when thoroughly beaten into very small pieces.

With these facts in mind:—

Among the objects of the invention, are—

(*a*) To provide a method for efficiently removing the lint from cotton seed hulls;

(*b*) To provide a method for grinding the hulls; and

(*c*) To provide an efficient and economical means for carrying out the methods above set out.

The means by which these and other objects are accomplished, and the manner of their accomplishment, will readily be seen from the following description on reference to the accompanying drawings, in which,—

Fig. 1 is a transverse section of the machine.

Fig. 2 is a side elevation of the machine.

Fig. 3 is a fragmentary longitudinal section taken on the line III—III of Fig. 1.

Referring now to the drawings in which the various parts are indicated by numerals, the machine comprises a base made up of end plates 10 and 11, between, and to which, are bolted front and rear plates 12 and 13. Also secured to the lower portions of end plates 10 and 11, are inclined plates 14 and 15 which form a hopper, which discharges into a conveyor box 16 in which is mounted a screw-flight conveyor 17 which may be driven in any usual or desired manner. Integral with the ends 10 and 11 are brackets 18, 19, respectively, which carry bearings 20, 21, in which a shaft 22 is journalled. The upper ends 23 of the front 12, and 24 of the rear 13, are turned inward at an angle of approximately 45 degrees with the horizontal. Concentric with the shaft 22 is a curved plate 25 which is disposed between the ends 10 and 11 and may be secured thereto as is desired. Preferably however, each of these ends is provided with an arcuate groove 26 concentric with the shaft 22 and the ends of the plate 25 are disposed in this groove. 27 is a feed-plate also secured between these two ends and closely abutting the inclined plate 23. Between the lower edge of the plate 27 and the plate 25 is a discharge opening which is covered by a screen 28 likewise concentric with the shaft 22.

Preferably the screen 28 and the plate 25 are secured together so that they may be slid into place or removed together. Immediately above and resting on the ends 10 and 11 are upper end plates 29 and 30 which may be bolted or otherwise suitably secured to the lower end plates 10 and 11. Disposed between these upper end plates is a cover comprising a substantially semi-cylindrical plate 31. 32 is a lint flue leading upward from this plate. Within and spaced away from the plate 31, is an arcuate screen 33 also concentric with the shaft 22, the space therebetween serving as a lint chamber. The front 34 of the plate 31 is bent inward to leave a feed-opening 35. 36 is a feed-chute, the lower end of which is spaced away from the part 23 of the front portion of the base so as to leave a gap 37 therebetween. Secured to the shaft 22 are a plurality of hubs 38 each of which hubs has a cylindrical disc flange 39 extending therefrom. Between each two adjacent flanges are secured sets of blades or knives 40 each set of blades comprising a number of thin rectangular metal plates which are pivoted on rods 41. When the shaft 22 is at rest, these blades hang downward but when the shaft is up to speed, centrifugal force causes them to assume a radial position such as is

shown in the drawings. When in this position, in the machine illustrated in these drawings, the lower screen and plate 25 is disposed ordinarily so that the ends of these knives clear the screen about ¾ of an inch, whereas the top screen is placed closer so that the knives clear that screen ordinarily about ⅜ of an inch. The shaft 22 is preferably driven by a motor 42 directly connected thereto. This shaft also is preferably directly coupled to an exhaust fan 43. 44 is an exhaust pipe which leads from the lint flue 32 to the suction side of the fan 43. 45 is a discharge pipe leading from the fan. Preferably the openings in the screen 33 are much smaller than those in the screen 28. In the machine illustrated the perforations in the screen 33 being quite small say $\frac{1}{32}$ inch in diameter while those in the lower screen are ⅛ inch in diameter.

The operation of the device is as follows: The machine is brought up to speed empty. Cotton seed hulls with lint attached thereto are fed by gravity, down the chute 36 into proximity to the openings 35 into the machine, any desired form of distributer being used to supply the feed to the chute 36 in a uniform manner and in the desired quantity. As the hulls reach the lower end of the chute, they are drawn into the machine by the current of air, set up, through the opening 35, by the exhaust fan, and are drawn by such suction across the gap 37 between the lower end of the chute 36 and the plate 23. Pieces of metal, gravel, or other heavy material which might happen to be in the hulls will be too heavy to be drawn across this opening, and will therefore fall through the same rather than enter the machine. The hulls, freed in this manner from the heavy material pass into the throat 35 and are drawn upward by the current of air toward the discharge pipe 32. While thus held in suspension they are struck by the blades 40 revolving downward across the opening and are therefore torn to pieces, and the lint dislodged therefrom, while virtually suspended by the inrushing current of air, which carries the dislodged lint upward through the screen 33 into the lint chamber and thence to the lint flue. The hulls are not only broken up but are also torn away from the action of this current of air by the knives and are carried around by the knives past the lower screen 26. While passing this screen those portions which are heaviest are thrown outward through the screen whereas the lighter portions, the lint, is drawn upward. Any heavy particles that are carried past the lower screen are carried past the blank section 25 and are thrown against the upper screen by the joint action of centrifugal force and the suction of the exhaust fan. The openings however, in this screen are so small that only the lint can be drawn therethrough and the heavier portions are again carried forward and thrown against the lower screen and such action is continued until all the heavier material is thrown through the lower screen and the lighter material drawn through the upper screen. The larger part however of the action of the machine takes place near the throat of the machine where the inrushing current of air opposes the downward movement of the knives and the current of air set up by the rotary movement of the knives.

It will thus be seen that the method, by which I clean the lint from the hulls, is to subject the hulls with lint attached to downward mechanical beating while they are suspended by the action of an upward current of air, whereby the hulls are mechanically broken up and the lint dislodged therefrom and the heavy hulls gravitate, and are carried, downward and there discharged, while the lighter lint is drawn upward by the air currents and carried from the machine by such currents.

It will be understood in the claims that the hulls referred to are the hulls as they come to the machine with lint attached.

It will further be understood that the lint removed and the delinted hulls separated therefrom are both of value, and after their recovery may be subjected to such further treatment as may be desired.

It will of course be understood that the drawings herein are for purposes of illustration only, and that I do not wish to confine myself to the exact details herein shown, except in so far as such details may be specifically set out in the claims.

Having thus disclosed the invention, what is claimed, is:—

1. The method of delinting cotton seed hulls, comprising carrying them in an upwardly flowing current of air and subjecting them to an oppositely moving abrading action whereby the lint will be abraded therefrom and removed by such air current.

2. The method of delinting cotton seed hulls, comprising drawing them into the path of a downwardly moving abrading means by an inwardly and upwardly moving current of air, whereby the lint will be dislodged therefrom and will be constantly upwardly removed and the heavier particles be driven downward and thereby separated from the lint.

3. The method of delinting cotton seed hulls, comprising drawing them initially into the downward path of a rotary abrading means by an inwardly and upwardly moving current of air, and thereafter subjecting unseparated particles to a continued rotary abrading action in the presence of such upward current, whereby the lint will be dislodged from the hulls and constantly upwardly removed and the heavier particles be

driven downward and thereby separated from the lint.

4. In a delinter, a rotary abrading means, a casing surrounding said means, said casing having a lateral feed-opening, a lint opening from the top thereof, and a screened opening through the lower portion of said casing; a screen, concentric with said abrading means, spaced away from the upper portion of said casing, whereby a chamber is formed between said screen and said upper portion of said casing, and means for exhausting air from said casing through said lint opening.

5. In a delinter, rotary abrading means, a casing surrounding said means, said casing having a lateral feed-opening, a lint opening from the top thereof, and a screened opening through the lower portion of said casing; a screen, concentric with said abrading means, spaced away from the upper portion of said casing, whereby a chamber is formed between said screen and said upper portion of said casing, means for exhausting air from said casing through said lint opening, and a feed chute leading toward but spaced away from said feed opening.

6. In a delinter, a shaft, a plurality of pivotally mounted knives carried thereby, means for driving said shaft, a casing surrounding said shaft and knives, said casing having a lateral feed-opening, a lint opening from the top thereof, and a screened opening through the lower portion of said casing; a screen concentric with said abrading means, spaced away from the upper portion of said casing, whereby a chamber is formed between said screen and said upper portion of said casing, a suction fan, and a pipe from said lint opening to said fan.

7. In a delinter, a shaft, a plurality of pivotally mounted knives carried thereby, a casing surrounding said shaft and knives, said casing having a lateral feed-opening, a lint opening from the top thereof, and a screened opening through the lower portion of said casing; a screen, concentric with said abrading means, spaced away from the upper portion of said casing, whereby a chamber is formed between said screen and said upper portion of said casing, and means for exhausting air from said casing through said lint opening.

In testimony of the foregoing, I affix my signature.

JAMES E. REDUS.