W. E. WORTH.

COTTON SEED DELINTING MACHINE.

APPLICATION FILED DEC. 29, 1908.

936,282.

Patented Oct. 5, 1909.

Fig. 1.

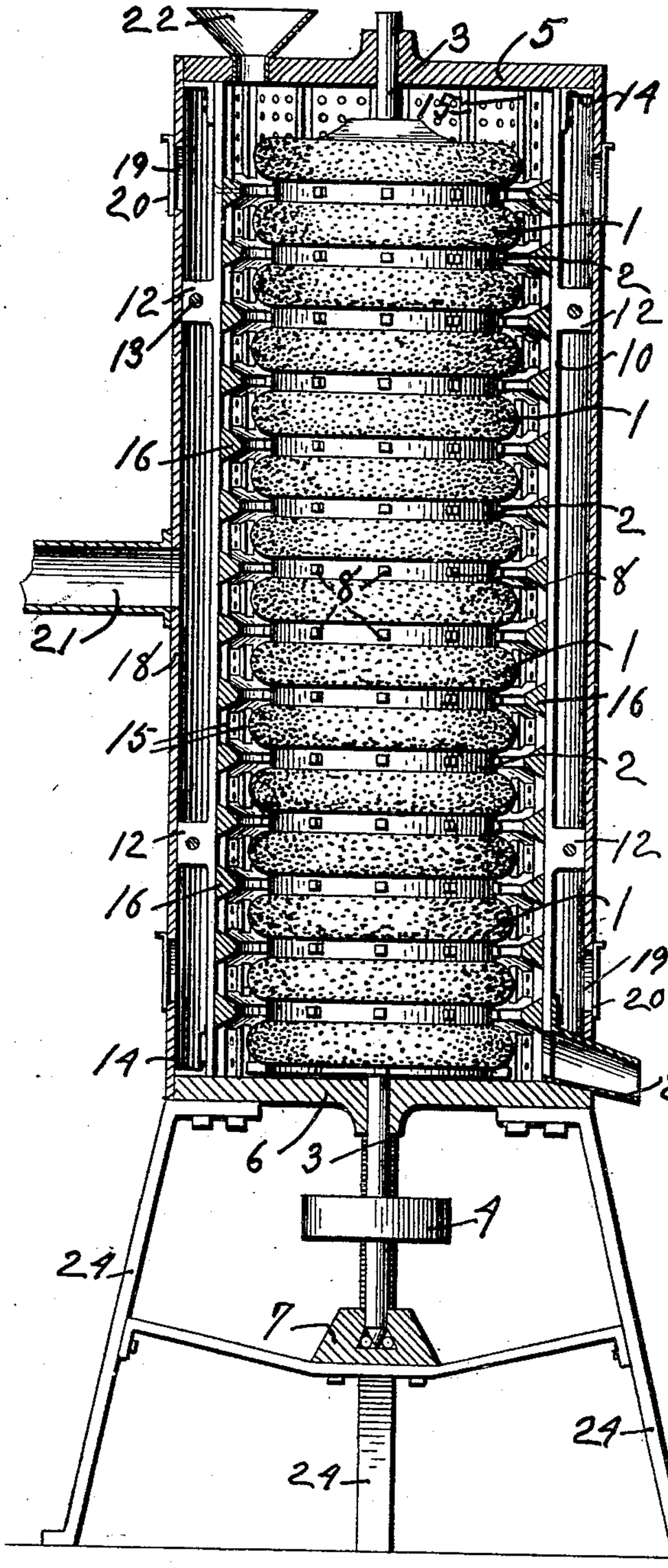


Fig. 2.

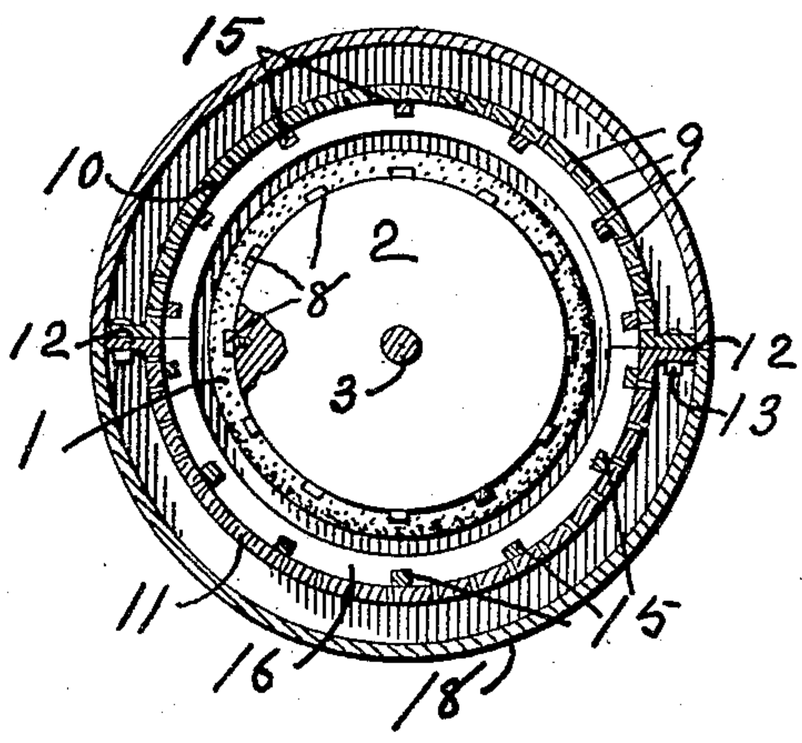


Fig. 3.

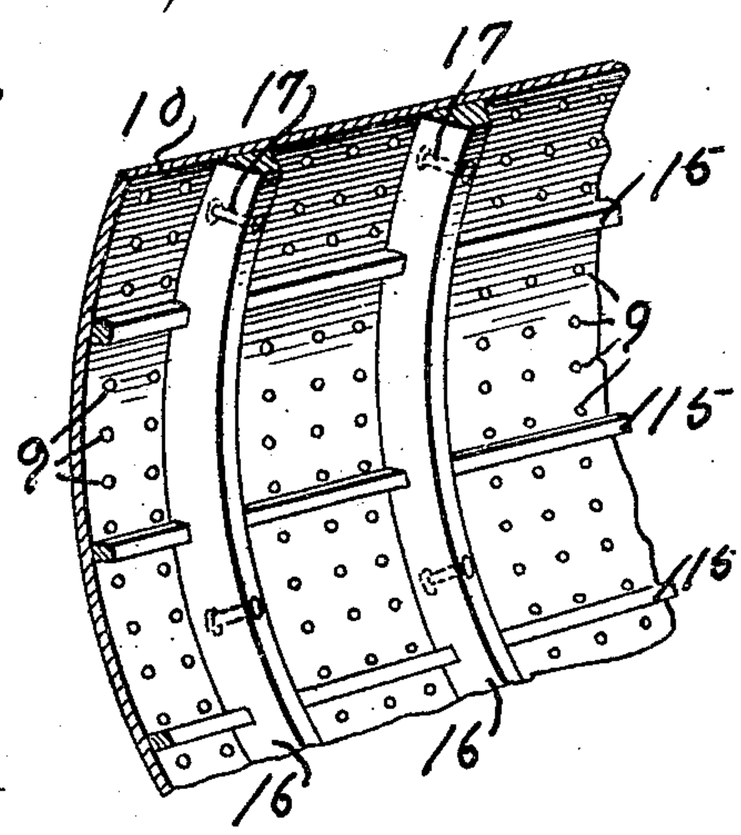
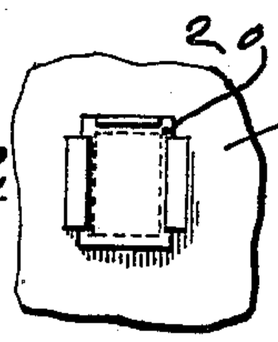


Fig. 4.



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WILLIAM ELLIOTT WORTH, OF WILMINGTON, NORTH CAROLINA, ASSIGNOR TO UNITED STATES COTTON SEED OIL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

COTTON-SEED-DELINTING MACHINE.

936,282. Specification of Letters Patent. Patented Oct. 5, 1909.

Application filed December 29, 1908. Serial No. 469,839.

To all whom it may concern:

Be it known that I, WILLIAM ELLIOTT WORTH, a citizen of the United States, residing at Wilmington, in the county of New Hanover, State of North Carolina, have invented certain new and useful Improvements in Cotton-Seed-Delinting Machines, of which the following is a description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to machines for removing from cotton seed the small portion of cotton fiber which is adherent to the seeds after they have been removed from the fiber as by a suitable gin, the purpose being to clean the seeds whereby they are rendered more desirable for planting or for other uses to which they may be put and if desired to recover the short cotton fiber for such uses as it may be adapted to. Such machines are known as delinting machines; and the object of my invention is to produce an improved machine for the purpose stated which will be effective for the purposes stated and one which may be easily manufactured and will be convenient in operation, and one which in operation will clean every portion of the surface of the seeds.

With these objects in view my invention consists in the improved cotton seed delinting machine shown in the accompanying drawing, described in the following specification, and particularly claimed in the clauses of the concluding claim; and in such various modifications of the device disclosed as will occur to one skilled in the art to which machines of the character disclosed relate.

In the accompanying drawing in which an embodiment of my invention is shown; Figure 1 is a view chiefly in vertical section but with the principal operating element of the device in elevation, Fig. 2 is a view showing a horizontal section of my device, Fig. 3 is a perspective view illustrating certain features of construction, and, Fig. 4 is a fragmentary view showing in elevation one of a number of air controlling members employed in the machine.

The reference numeral 1 denotes abrasive disks, a plurality of which are employed in each machine, and which may be formed from emery, carborundum, or other suitable abrasive material; or may comprise a body of material not abrasive but with abrasive material upon its periphery; the essential feature being that the periphery of the disks which contact with the seeds be abrasive in character. The number of such abrasive disks used in each machine is of secondary importance, and may vary. The proper number will be determined largely by experiment, and the number selected will be such as to give the best results in the greatest number of cases possible. I have illustrated a machine in which fifteen such disks are used, and have experimented with greater and with less numbers of disks. While the machine illustrated has proved effective and satisfactory, my experiments would seem to indicate that a smaller number of disks would clean the seeds satisfactory and with a less expenditure of power than a machine employing fifteen disks.

The disks 1 are convex at their periphery as shown, and are separated from one another by a plurality of metal disks 2, the abrasive disks 1 and metal disks 2 being disposed alternately as will be understood from the drawing. The disks 1 and 2 are secured upon a vertical shaft 3 in any suitable way and the shaft and disks are rotated by means of a pulley 4. The shaft 3 is supported in suitable bearings in upper and lower heads 5 and 6 forming part of the external casing of the machine, and a thrust bearing 7 is provided to support the lower end of the shaft 3. The disks 2 are of lesser diameter than the abrasive disks 1, and are provided upon their peripheries with a series of projections 8, which I have termed "knockers" because of the function they perform of breaking up masses of the seed and preventing them from adhering to one another and forming lumps, which is particularly likely to occur when the seeds are first supplied to the machine and in the upper part of the machine before any considerable amount of the adherent cotton has been removed from them. As more and more of the adherent cotton is removed as the seeds pass downward through the machine this tendency to form lumps becomes less, but I prefer to provide all of the disks 2 with projections 8, as above stated. The projections 8 may conveniently be the heads of ordinary set screws secured in threaded openings in the disks 2, as shown in the small sectioned portion of the disk appearing in Fig. 2.

The rotating member of my machine made

up of the disks 1 and 2, and the shaft 3 as above disclosed, is surrounded by a cylindrical internal casing located adjacent the periphery of the abrasive disks 1 and extending between the heads 5 and 6 and perforated throughout as shown, these perforations being indicated by the numeral 9. These perforations are not large enough to permit a cotton seed to pass through; but their size, and the number provided per unit area of the casing, may be otherwise varied to a considerable extent. I find that ordinary perforated sheet metal, such as may be purchased in the open market, may be used for this inner casing. This casing is preferably in two parts 10 and 11, of semi-cylindrical form for convenience in manufacture, and ears are provided as at 12 for securing the two parts together, a bolt 13 passing through these ears as will be understood. Flanges 14 are provided at the upper and lower ends of the perforated casing referred to for the purpose of strengthening the ends thereof and securing the said casing and the heads 5 and 6 together.

A plurality of vertically extending bars 15 is provided upon the inner surface of the perforated casing, the purpose of these bars being to break up masses of the seeds and prevent them from collecting and forming lumps, and to prevent the seeds from traveling around the interior of the casing instead of passing downward in accordance with the contemplated mode of operation of the machine. In this respect the bars 15 coöperate with the projections 8 upon the disks 2, and both sets of elements contribute to producing the same result. These bars are preferably square in cross-section, but their form is of secondary importance so long as the formation of lumps as above explained is prevented.

16 are annular baffles or deflecting elements disposed upon the inner surface of the inner perforated casing above referred to and secured thereto by rivets 17. These baffles are recessed upon their outer portions to fit over the bars 15 as shown in Figs. 2 and 3, and their location upon the inner casing is such that they are directly opposite the disks 2, as clearly shown in Fig. 1. They are therefore disposed between successive abrasive disks 1 and in position such that the seeds after having been acted upon by any particular disk will, as they pass downward, be deflected inward toward the next lower abrasive disk of the series. The number of these deflecting disks is preferably the same as the number of separating disks 2 opposite which they are disposed.

The combined effect of the projections 8, bars 15 and deflecting elements 16 is to prevent the formation of adhering masses of seeds, to prevent the seeds from traveling in a circular path, and to return the seeds to the abrasive disks as they pass downward through the machine; and these elements also produce a continual turning of the seeds so that every portion of their surface is brought into contact with and is acted upon by some one of the abrasive disks, the final result being that every portion of the seeds is cleaned or delinted during the passage through the machine.

The elements thus far described are inclosed within an external casing 18 which connects the heads 5 and 6. This casing is provided with air inlets 19, as many as may be required, each of which has a sliding door 20 to regulate the inflow of air.

21 is a pipe which leads to a suitable suction fan for withdrawing air from the casing; and for withdrawing also the dirt and lint removed from the seeds as above, and which finds its way into the space between the inner and outer casings through the perforations 9 in the inner casing.

22 is a hopper through which seeds are supplied to the machine and 23 is a discharge spout through which they pass from the machine.

24 are legs for supporting the machine in a vertical position.

It will be understood that the air withdrawn through the pipe 21 enters the machine partly through the openings 19 and partly through the openings through which the seeds are supplied to and escape from the chamber within the inner perforate casing in which they are acted upon by the abrasive disks. The purpose of the openings 19 in the external casing is to provide a sufficient volume of air to carry away the lint and dirt from the seeds operated upon, from the space between the two casings. From this it will be appreciated that the quantity of air admitted to this space will be determined by the operator and will probably vary with each batch of seeds and perhaps during each run; and it will be obvious that under some conditions the machine may be operated with the openings 19 closed, in which all the air withdrawn through the pipe 21 will have entered the machine through the hopper 22 and discharge spout 23.

Having thus described my invention and explained the operation thereof, I claim and desire to secure by Letters Patent:

1. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of bars within said casing; a plurality of deflecting elements within said casing and disposed between adjacent abrasive disks; a vertically arranged

external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

2. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of vertically extending bars within said casing; a plurality of annular deflecting elements within said casing and disposed between adjacent abrasive disks; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings, and provided with air inlet openings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

3. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; projections upon the periphery of said separating disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of bars upon the inner surface of said casing; a plurality of deflecting elements secured to the inner surface of said casing and disposed between adjacent abrasive disks; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

4. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; projections upon the periphery of said separating disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of vertically extending bars upon the inner surface of said casing; a plurality of annular deflecting elements secured to the inner surface of said casing and disposed between adjacent abrasive disks; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings, and provided with air inlet openings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

5. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; projections upon the periphery of said separating disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of vertically extending bars upon the inner surface of said casing; a plurality of annular deflecting elements secured to the inner surface of said casing and disposed between adjacent abrasive disks; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings, and provided with air inlet openings; a discharge pipe leading from said external casing; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

6. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; projections upon the periphery of said separating disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of vertically extending bars upon the inner surface of said casing; a plurality of annular deflecting elements secured to the inner surface of said casing and disposed between adjacent abrasive disks; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings, and provided with air inlet openings; a discharge pipe leading from said external casing; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

7. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive

disks; projections upon the periphery of said separating disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of bars upon the inner surface of said casing; a plurality of deflecting elements secured to the inner surface of said casing; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

8. In a device of the class described, a vertically arranged rotary shaft; a plurality of abrasive disks upon said shaft; a plurality of separating disks upon said shaft and arranged in alternation with said abrasive disks; a vertically arranged perforate casing surrounding said disks and located adjacent thereto; a plurality of vertically extending bars within said casing; a plurality of annular deflecting elements within said casing; a vertically arranged external casing surrounding said internal casing and separated therefrom to thereby provide a space between said casings; and provided with air inlet openings; means for withdrawing air from the space between said casings; means for supplying seeds to be operated upon to the upper portion of said internal casing; and means whereby the seeds are discharged from the lower portion of said internal casing.

This specification signed and witnessed this twenty first day of December A. D. 1908.

WILLIAM ELLIOTT WORTH.

In the presence of—
JAS. W. COLLINS,
WM. P. TOON.