

No. 814,140.

PATENTED MAR. 6, 1906.

J. S. JORDAN.
CHOP GRADER.

APPLICATION FILED OCT. 11, 1904.

2 SHEETS-SHEET 1.

Fig. 1.

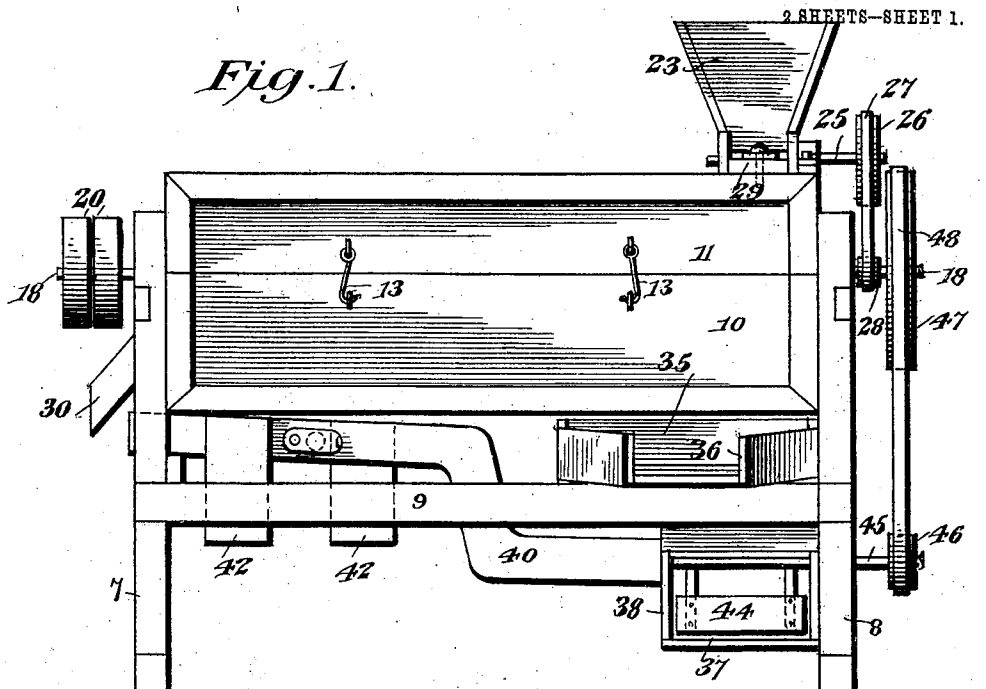


Fig. 6.

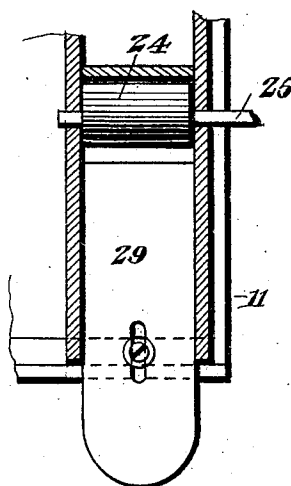


Fig. 5.

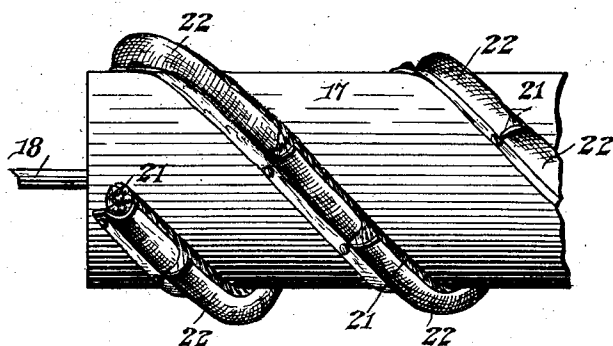


Fig. 7.



Witnesses
James E. McArthur
B. A. Foster

Julius S. Jordan, Inventor

By

E. J. Siggers

Attorney

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2 SHEETS—SHEET 2.

Fig. 2.

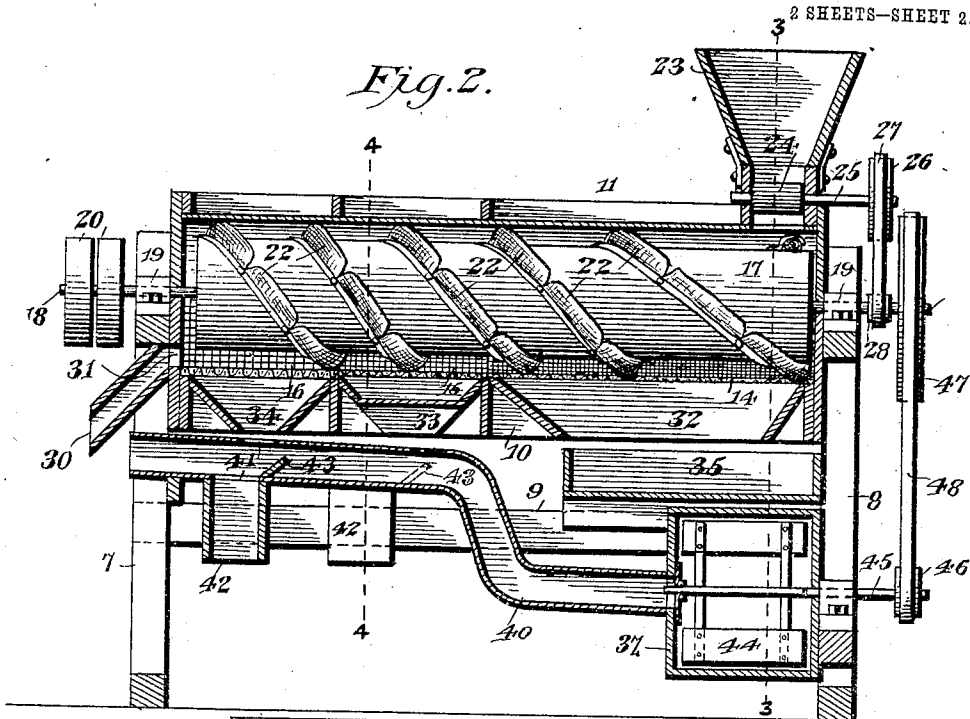


Fig. 3.

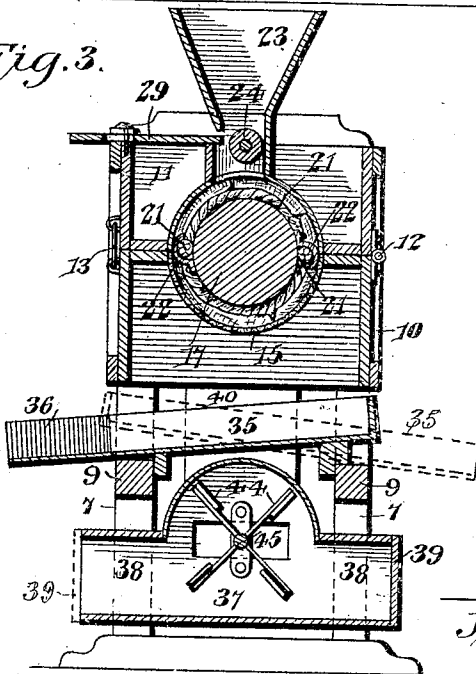
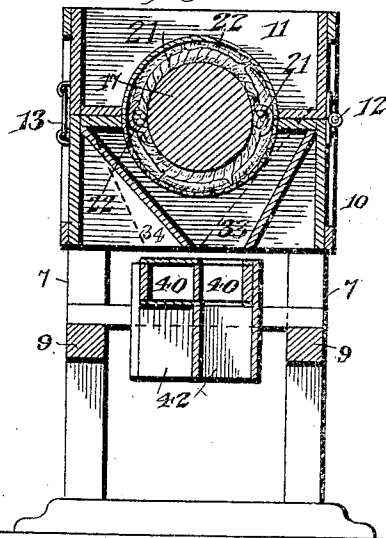


Fig. 4.



Julius S. Jordan, Inventor

Witnesses

Jas. E. McLaughlin

B. J. Foster

By

E. G. Figgers

Attorney

UNITED STATES PATENT OFFICE.

JULIUS S. JORDAN, OF SIDNEY, SOUTH CAROLINA.

CHOP-GRADER.

No. 814,140.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed October 11, 1904. Serial No. 228,072.

To all whom it may concern:

Be it known that I, JULIUS S. JORDAN, a citizen of the United States, residing at Sidney, in the county of Colleton and State of South Carolina, have invented a new and useful Chop-Grader, of which the following is a specification.

This invention relates to means for grading ground grain, such as cornmeal and the like.

The object is to provide simple apparatus of the above character which will efficiently separate the different grades of material, will remove therefrom the chaff and like refuse, may be thoroughly inspected and readily cleansed, and may be conveniently located to discharge the material from either side of the machine.

It will of course be apparent that the structure may be employed for the material besides chop.

In the accompanying drawings, Figure 1 is a side elevation of the preferred embodiment of the invention. Fig. 2 is a longitudinal sectional view therethrough. Fig. 3 is a cross-sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is a cross-sectional view taken on the line 4 4 of Fig. 2. Fig. 5 is a detail view in elevation of a portion of the conveyer-brush. Fig. 6 is a horizontal sectional view through the feed-hopper. Fig. 7 is a detail sectional view through a portion of the conveyer-brush.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a frame is employed comprising end standards 7 and 8 and longitudinal bars 9, supporting a body-casing 10, having a cover 11 hinged along one side, as shown at 12, and provided with suitable fasteners 13 on the opposite side. The body contains a concave bed formed of screens 14, 15, and 16, three being shown in the present instance, though a greater or less number may be employed, as desired. These screens are of different sizes of mesh, as illustrated in Fig. 2. A conveyer-brush coöperates with the screen-bed and consists of a revoluble cylindrical body 17, located longitudinally over the body in spaced relation thereto and mounted on a shaft 18, projecting beyond the opposite ends of the casing, said shaft being journaled in boxings 19. One of the projecting ends of the shaft is provided with loose and tight pulleys 20, around which

is passed the driving-belt operated from any suitable source of power.

The cylindrical body 17 is provided with a worm bead or projection, consisting of a yielding core 21, formed of rope or cordage, a plurality of lines being preferably employed, forming a plurality of beads. Coöperating with the cores are flaps, preferably formed of flexible material, such as leather, and comprising sections 22, said flaps being secured along one edge at one side of the cores and overlying the same, the free edges being adapted to operate against the upper face of the bed. As shown in Fig. 2, the finer screen is somewhat longer than the others, and the pitch of the spirals or worms is preferably made greater.

The material to be separated or graded is fed to the machine through a hopper 23, mounted on one end of the cover above the finest screen. Within this hopper is journaled a feed-roller 24, having a projecting shank 25, carrying a pulley 26, about which passes a belt 27, that also operates about another pulley 28, located on the shaft 18 of the brush, the pulley 26 being considerably larger than the pulley 28. A slide 29 is horizontally mounted in the lower portion of the hopper 23 and is movable toward and from the roller 24, so as to vary the size of the feed-opening in the lower portion of the hopper. A discharge-spout 30 is located at the opposite end of the machine to the feed-hopper and has communication through an opening 31 with the interior of the casing just above the rear end of the screen-bed.

Beneath the different screens of the bed are located receiving-hoppers 32, 33, and 34. The hopper 32 is arranged beneath the fine screen 14, and located beneath said hopper is a chute 35, loosely supported on the longitudinal bars 9 of the frame, said chute being reversible, as will be apparent by reference to Fig. 3. This chute has a discharge-mouth 36, that projects from one side of the machine. A fan-casing 37 is located beneath the chute 35 and is provided with transversely-disposed oppositely-extending discharge-spouts 38, that project from the opposite sides of the machine. Either of these spouts is adapted to be closed by a cap-plate 39. Air-conduits 40, arranged side by side, extend longitudinally beneath the body of the machine and have communication with

the fan-casing at one end. These conduits are each provided with an upper and a lower opening 41, the upper opening of one being located directly beneath the discharge end of the hopper 37 and the other opening of the other being likewise located beneath the discharge end of the hopper 37. Depending spouts 42, extending from the lower portions of the conduit and alined with the lower openings 41, have their lower ends arranged sufficiently above the floor upon which the machine is placed to permit the introduction of bags or other receivers. Deflector or baffle plates 43 are arranged in the conduits extending from the lower openings thereof at an inclination upwardly and terminating short of the tops of said conduits, as illustrated in Fig. 2.

A rotary fan 44 is located in the fan-casing and has a shaft 45 projecting from the end of the machine. This shaft carries a pulley 46, receiving power from a larger pulley 47, located on the brush-shaft 18, through the medium of a belt 48.

The operation of the machine may be briefly outlined as follows: Power applied to the tight pulley 20 will of course operate the combined brush and conveyer, so that material fed through the hopper 23 will be passed longitudinally over the bed, and thus over the different screens, the feed of the material being regulated by the slide 29. The finest grade of flour passing through the screen 14 and hopper 32 will fall upon the chute 35 and gravitate down the same into a receiver placed beneath the mouth 36. The next coarser grade will pass through the screen 16 and the hopper 33. From the hopper 33 the screened material will drop into and fall transversely through one of the conduits 40. The fan 44 being in operation, a draft of air through said conduit will be created, and thus all the light material, such as chaff and the like, will be separated from the heavier substances, which will pass on through the conduit and the hopper 42 into a receptacle arranged below the same. In like manner still coarser material passing through the coarsest screen 16 will enter the other conduit 41 and be cleaned from the light refuse, finally escaping through the other chute 42. All unground and large tailings will be finally carried to the end of the bed and discharged through the chute 30. The particular construction of the brushing means has been found very efficient, particularly in ground material of the nature above outlined. The cordage, acting in the nature of a yielding support for the flaps, will brush over the screens, the arrangement thus effecting a thorough cleaning action upon said screens and a continual movement of the material over the bed. The finest grade of flour, which would be free of chaff and the like, is not subjected to the fanning action, while the others

are thoroughly freed thereby from the refuse. Because of the hinged cover the bed may be readily inspected by detaching the belt 27 and throwing the cover back, in which condition the brush may be easily removed by detaching the boxings, all of which will be apparent by reference to Fig. 2. Another feature of importance is the manner in which the machine may be reversed, so as to discharge from either side. It is only necessary to change the position of the chute 35 and then place the cap 39 upon the opposite discharge-spout of the fan-casing. In larger mills where a plurality of graders are employed instead of a separate fan for each machine it will be clear that one fan may be coupled to all, if desired.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a chop-grader, the combination with a concave bed comprising screens having meshes of different sizes, of a rotatable body located thereover, a combined brush and conveyer-worm carried by the body and coacting with the different screens, said worm comprising a core formed of cordage secured spirally upon the body, and a spiral flexible flap secured and disposed alongside the core, said flap covering the core, and having its free margins brushing the screens during the rotation of the body.

2. In a chop-grader, the combination with a screen-bed, of a rotatable body located thereover, and a worm carried by the body and coacting with the bed, said worm including a flap extending continuously a plurality of times about the body and comprising flexible sections disposed substantially end to end and extending in a continuous spiral about the body from end to end thereof, said sections being each secured along one longitudinal margin to the body and having independent free longitudinal margins that brush against the screen-bed during the rotation of the body.

3. In a chop-grader, the combination with a concave bed comprising screens having meshes of different sizes, of a rotatable body located thereover, and a combined brush and conveyer-worm carried by the body and coacting with the different screens, said worm comprising a flexible core secured spirally upon the body, and a flap comprising flexible sections disposed substantially end to end

and extending in a continuous spiral about the body, said sections covering the core and having independent free margins that brush against the screens during the rotation of the body.

4. In a chop-grader, the combination with a concave bed comprising screens having meshes of different sizes, of a rotatable body located over the bed, and a worm secured to the body and comprising a core formed of cordage that is wrapped spirally upon the body and a spiral flap comprising sections of flexible material, each section being secured at one edge to the body and having their opposite free edges in engagement with the screens.

5. In a chop-grader, the combination with a screen having aligned portions provided with meshes of different sizes, of means for effecting the passage of material thereover and therethrough, a plurality of separate air-conduits extending beneath the screen and separate therefrom, said conduits having top and bottom walls beneath the screen, said walls being provided with openings, means for directing material that passes through certain of the screen portions respectively to the different top openings and thereby across the conduits, and means for creating air-currents longitudinally through the conduits and transversely of the streams of material dropping through the openings.

6. In a chop-grader, the combination with a screen having portions provided with meshes of different sizes, of means for effecting the passage of material thereover and therethrough, a plurality of separate air-conduits extending longitudinally beneath the screen and in spaced relation thereto, hoppers arranged beneath certain of the screen portions and delivering the material that

passes therethrough transversely of the conduits, and means for creating air-currents longitudinally through said conduits and transversely of the streams of material delivered by the hoppers.

7. In a chop-grader, the combination with a screen-bed having portions provided with meshes of different sizes, of means for passing material over said bed, a fan located beneath the bed, separate conduits joined to the fan and extending longitudinally beneath the bed, said conduits having openings in their top and bottom walls, and hoppers disposed beneath certain portions of the bed and having discharge ends located over the upper openings of the conduits, said hoppers being interposed between said conduits and the screen-bed.

8. In a chop-grader, the combination with a body, of a screen-bed located therein and having portions provided with meshes of different sizes, hoppers located beneath said portions, a fan disposed beneath the bed in spaced relation thereto, conduits extending longitudinally beneath the bed and having inlet-openings communicating with the discharge ends of certain of the hoppers, oppositely-extending discharge-spouts for the fan, a device for closing either of said spouts, and a reversible chute detachably supported on the body above the fan and arranged beneath one of the hoppers that does not coact with the conduits.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JULIUS S. JORDAN.

Witnesses:

J. G. PADGETT,
E. R. McFEIR.