Jan. 13, 1931. J. H. MOTT 1,788,686

OAT HULLER

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Fig. 1.

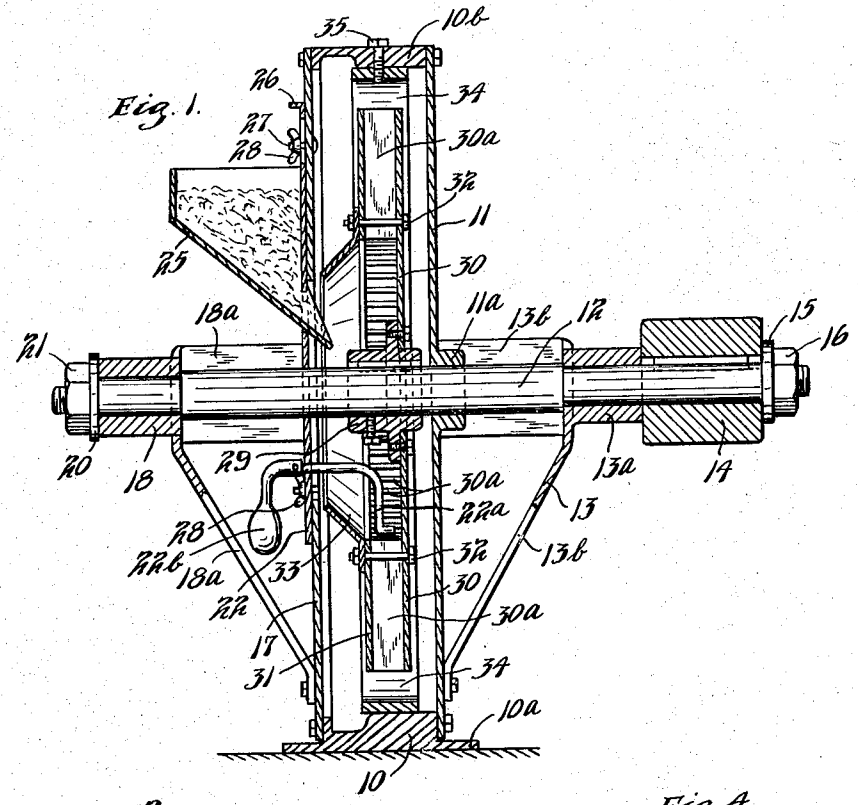


Fig. 2.

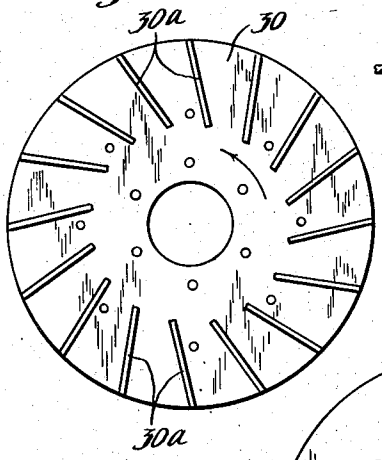


Fig. 5.

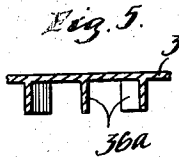


Fig. 4.

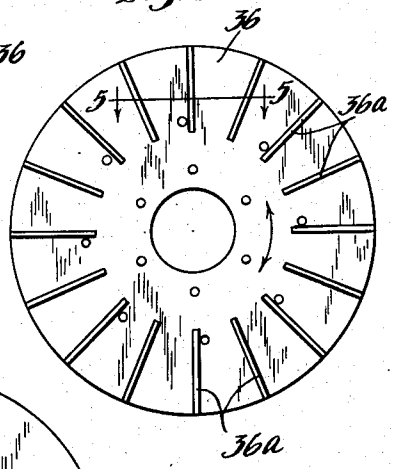
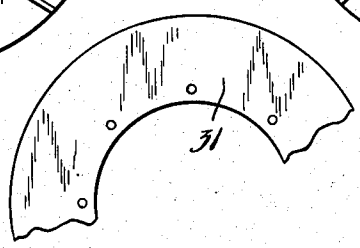


Fig. 3.



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Fig. 6.

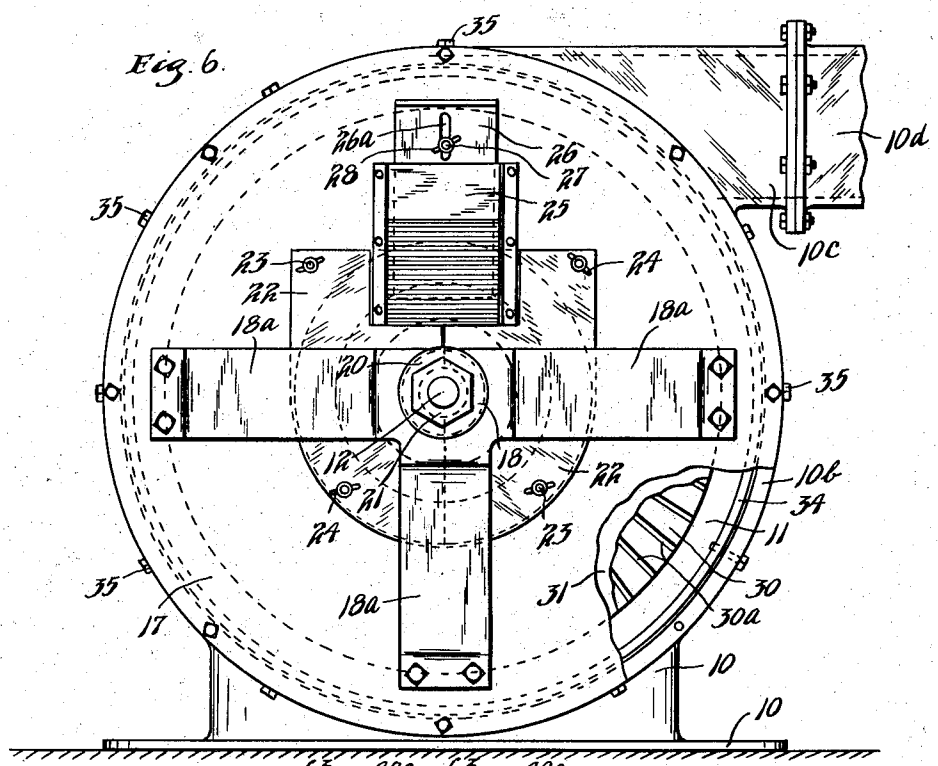
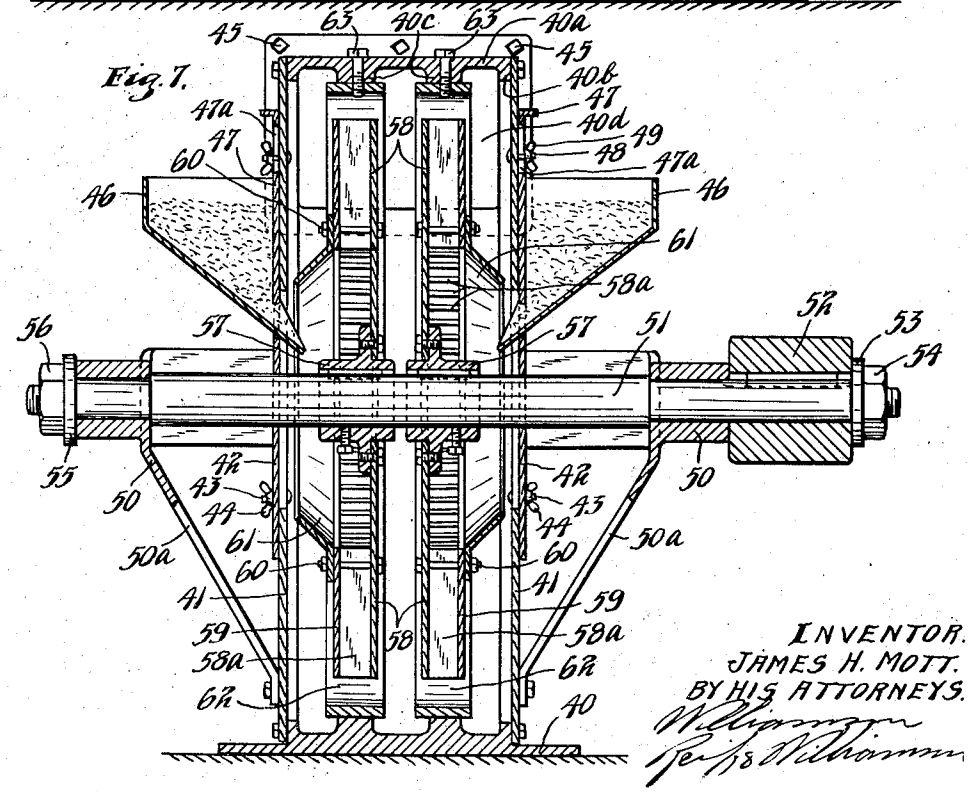


Fig. 7.



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UNITED STATES PATENT OFFICE

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OAT HULLER

Application filed May 28, 1928. Serial No. 281,027.

This invention relates to an oat hulling or similar machine. In recent years it has been considered desirable to hull oats before using the same as a stock food, either alone or mixed with other foods. It is also often desirable to run other grains or foods such as corn, through a hulling machine, for disintegrating the same. These grains or stock foods so treated are often mixed to form a rationed food.

It is an object of this invention, therefore, to provide a very simple and efficient hulling apparatus comprising a rotary member which receives and distributes the grain.

It is a further object of the invention to provide a simple and efficient hulling device comprising a disk having thereon blades or flutes for distributing the grain, a ring being provided, extending about the disk and flutes, against which the grain is projected.

It is also an object of the invention to provide a hulling machine comprising a casing having therein a plurality of fluted disks with spaced rings surrounding said disks, said casing having a discharge spout through which the material is discharged by the rotation of said fluted disks.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings, in which like reference characters refer to similar parts throughout the several views and in which:—

Fig. 1 is a central vertical section through the device;

Fig. 2 is a face view of one of the disks used;

Fig. 3 is a partial face view of the ring used;

Fig. 4 is a view similar to Fig. 2, showing a modified form of disk;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 4 as indicated by the arrows;

Fig. 6 is a view in side elevation of the device, a portion being broken away; and

Fig. 7 is a view similar to Fig. 1, showing a modified form of the device.

Referring to the drawings, a machine is shown, having a base member 10 having a flange 10*a* at the bottom thereof, by means of which it may be secured to a suitable support. The base 10 carries at the upper portion therof a cylindrical casing 10*b* open at its sides. Said casing has a tangentially extending outlet conduit 10*c* at one upper side thereof, having a flange at its outer end, said flange being adapted to be bolted to another convenient conduit 10*d* as shown in Fig. 6. One side of this casing is closed by a circular plate 11 having a hub 11*a* at the central portion thereof forming one bearing for a shaft 12. Said shaft has an outer reduced portion which is also journaled in the hub 13*a* of the bracket 13, which has outwardly and downwardly extending arms 13*b* secured at their outer ends to the plate 11. Shaft 12 has a pulley 14 secured thereto as by a suitable key, the same being held in place by a washer 15 which is in turn engaged by the nut 16 threaded on the end of shaft 12. The other side of the casing 10*b* is closed by a circular plate 17, having a central aperture through which shaft 12 passes, said shaft having a reduced portion at the outer side of plate 17 and spaced therefrom, which is journaled in the hub of bracket 18 having laterally and downwardly extending arms 18*a* which are secured to the plate 17, these arms being similar to the arms 13*b* of bracket 13. Said shaft is held in place longitudinally by a washer 20 engaging the hub of bracket 18 and in turn held in place by a nut 21 threaded on the end of said shaft. A plate 22 of semi-circular outline at its lower half and of rectangular outline at its upper half is secured to plate 17, covering the opening therein, plate 22 being held by a plurality of bolts 23 extending through plate 17 and equipped with the wing nuts 24. The plate 22 has secured thereto a hopper 25 having the lower portion of its bottom and sides projecting through an opening in plate 22 and said hopper is adapted to be closed by a sliding gate 26 having a slot 26*a* therein, through which passes a screw 27 disposed in the plate 17, said screw being provided with a wing nut 28 which can be tightened to hold plate 86 in various adjusted poistions. Plate 26

has its upper end turned outwardly at right angles to form means for manipulating the same.

The shaft 12 has secured thereto between plates 11 and 17 a member 29 having a circular flange intermediate its ends, to which is bolted a plate or disk 30. Disk 30 has a central opening closed by one end of member 29, and said disk has secured thereto adjacent its outer edge a plurality of flutes or ribs 30*a*, the same terminating equal distances from the center of said disk. An annular plate or disk 31 overlies the ribs 30*a* and is secured to disk 30 by a plurality of circumferentially arranged and spaced headed and nutted bolts 32. Said bolts also hold in place a frusto-conical plate 33 having an annular flange through which bolts 32 pass. Member 33 has its smaller end directed outwardly and as shown in Fig. 1, the lower and inner end of hopper 25 extends into said member. A ring 34 extends about the disks 31 and 32 and is held in place by circumferentially spaced screws 35 extending through casing 10*b*. A rod or shaft 22*a* extends through plate 22 and the member 33 and has its end bent downwardly to be in close proximity to the inner end of ribs 30*a*, said end being bent substantially at right angles to extend some distance along the ends of the ribs. A weighted arm 22*b* is secured to the rod 22*a* at the outer side of plate 22, which normally depends downwardly and holds rod 22*a* in the position shown in Fig. 1.

In operation the oats to be hulled is placed in the hopper 25. The gate 26 is disposed at the proper height and pulley 14, shaft 12 and the disks 30 and 31 are driven at high speed by a suitable belt running over pulley 14. The rotation of the disk is in the direction indicated by the arrow in Fig. 2. The oats feed into the member 33 and is directed between disks 31 and 32 and the ribs or flutes 30*a*. The same is distributed between said disks and impacted thereby and moves outwardly along said ribs. The oats move outwardly with the grains moving endwise, or with their longitudinal axes directed outwardly. The material is thus projected outwardly at high velocity and the oat grains strike against the inner side of ring 34, the ends of the grains striking said ring and the grains thus being hulled, allowing the inner grain or meat to drop out. This impact of the oats or other material being operated upon against the ribs 30*a* and against ring 34 thus effectively hulls the oats. The rotation of the disks 30 and 31 with the ribs 30*a* thereon produces a strong draft of air, said parts acting as a fan, and this blast of air is discharged at high velocity through conduits 10*c* and 10*d*. This discharge of the air also causes an inwardly moving current of air through hopper 25. The arm 22*a* disposed against the inner end of the ribs 30*a* clears any obstruction which might lodge between the ends of said ribs and thus prevents the entrance of the oats. Should any obstruction become stuck between the inner ends of said ribs, the rod 22*a* could swing away and would be returned after the obstruction passed, by the weighted arm 22*b*. The inner ends of ribs 30*a* are weighted close together so that any comparatively small number of the oat grains can pass therethrough in one revolution of the disks. The oats are thus distributed along the ribs longitudinally thereof and as above stated, are thrown out endwise against ring 10*d*. The oats are thus effectively hulled and discharged from the machine. The blast produced can be used to carry the oats through conduit 10*d* to the desired point.

In Fig. 4 a modified form of the disk 36 is shown, which may be used in place of the disk 30 and said disk 36 has ribs 36*a* thereon which, as shown in Fig. 4, are radially disposed. It will be noted that, as indicated by the arrows in Fig. 4, when such a disk as the disk 36 is used, the machine can be driven in either direction.

In Fig. 7 a modified form of the invention is shown, in which a base member 40 is used, having carried above the same a cylindrical casing 40*a*, the same being open at its sides and having inwardly extending flanges 40*b* at its inner side. The casing 40*a* will also be equipped with a tangentially extending outlet conduit 40*d* flanged at its outer side to have connected thereto another conduit, as by the bolts 45. Said casing also has spaced annular ribs 40*c* extending about its inner side. Said casing is closed at either side by bolts 41 substantially circular in outline, each of which has a rather large opening at its center which is closed by a plate 42, plates 42 being respectively secured to plates 41 by bolts 43 which are equipped with wing nuts 44. The plates 42 are shaped similarly to the plates 22 already described and carry at their upper portions the hoppers 26, the bottom and lower portions of the sides of which extend inwardly of the plates 42 and through the openings in plates 41. Hoppers 46 have gates 47 for closing the opening therefrom, said plates having vertical slots 47*a* through which extend the bolts 48 equipped with the wing nuts 49. The other ends of the gates 47 are bent outwardly to form a manipulating flange and said gates may be held in various vertical positions by adjustment of the nuts 49. Brackets 50 are secured at the outer side of the plates 41, the same having laterally and downwardly extending arms 50*a* similar to the brackets 13, and a shaft 51 has reduced end portions journaled in the hubs of brackets 50, said shaft carrying adjacent one end

a pulley 52 held in place by a washer 53 in turn engaged by a nut 54 threaded on one end of said shaft. Said shaft is held from longitudinal motion by a washer 55 at its other end engaged by a nut 56 threaded on the latter end of said shaft. Shaft 51 has secured thereto spaced members 57, each provided with a circumferential flange, which flanges are respectively secured to disks 58. The disks 58 are similar to the disks 30 or 36 and have spaced ribs or flutes 58*a* thereon. Annular plates 59 are respectively secured on top of the flutes or ribs 58*a* of the disks 58 by circumferentially spaced headed and nutted bolts 60. Each plate 59 has also secured thereto by the bolts 60 a frusto-conical member 61, the outer edge of which extends beyond the inner edge of the hoppers 46. Rings 62 are secured to the ribs 40*c* by circumferentially spaced screws 63 extending through casing 40*a*.

In operation the oats to be hulled is placed in the hoppers 46, and shaft 51 together with disks 58 and 59, are driven at high speed by a belt running over pulley 52. The gates 47 are adjusted and the oats feeds downwardly into member 61 and is directed into the central openings of disks 59, where it is distributed between the ribs 58*a*. The material is impacted by these ribs and thrown outwardly with great force against the rings 62. This action effectively hulls the oats. The rotation of the disks 58 and flutes 58*a* causes a strong blast of air out through opening 40*d* and the hulled oats are projected out through this opening and through the conduit connected thereto. This blast of air carries with it the hulled oats so that the same are continuously discharged from the machine. This blast of air also causes an entering current of air through the hoppers 46 which assists in the feed of the material.

From the above description it is seen that applicant has provided a very simple and efficient machine for hulling oats and operating on similar stock food material. The structure of the device is quite simple and the device is easily and inexpensively made and assembled. The machine operates continuously and has a large capacity. The machine has also been found to be very effective for hulling clover seed and for breaking up and hulling flax bolls. The device has been amply demonstrated in actual practice and found to be very successful and efficient.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which, generally stated, consists in a device capable of carrying out the objects above set forth, in the novel parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:—

1. A device of the class described having in combination, a casing, a rotatable disk in said casing having ribs at one side thereof separated at their inner ends and diverging outwardly therefrom, said casing having walls parallel respectively to the sides of said disk and spaced from said disk and a wall extending circumferentially around said disk and spaced therefrom, a ring secured to said latter wall of less width than said wall thus leaving a chamber for discharging material at both sides of said ring and a discharge conduit for said casing leading from both sides of said ring, and both of said chambers.

2. A device of the class described having in combination, a casing, a rotatable disk in said casing having ribs at one side thereof separated at their inner ends and diverging outwardly therefrom, a second disk over-lying said disk and having a central opening with its edge disposed substantially at the inner ends of said ribs, said casing having walls parallel to and spaced from said disks respectively and a wall extending circumferentially around said disks and spaced from the outer edges thereof, a ring secured to the inner side of said latter wall projecting inwardly therefrom forming chambers at both sides thereof, and a discharge conduit leading tangentially from said casing and from both of said chambers.

3. A device of the class described having in combination, a casing, a rotatable disk in said casing having ribs at one side thereof separated at their inner ends, said ends terminating substantially in a circle and diverging outwardly from said inner ends, a disk over-lying said ribs and having a central opening, the edge of which is disposed substantially at the inner ends of said ribs, a frusto-conical ring secured to said second disk having its smaller end remote from said disk, means for feeding material through one of said first mentioned walls into said ring and the ends of said ribs, a ring secured to said last mentioned wall and surrounding said disk and ribs, said casing forming a chamber at either side of said ring and a tangential outlet leading from said casing and from both sides of said ring.

4. A device of the class described having in combination, a casing, a rotatable disk in said casing having a plurality of spaced diverging ribs formed on one side, said ribs being spaced at their inner ends which lie substantially in a circle concentric with said disk, said casing having walls substantially parallel to the sides of said disk, receiving means for feeding material through one of said walls to the ends of said ribs, said casing having a circumferential wall spaced from the outer ends of said disk and ribs,

a ring secured to said wall surrounding said disk and ribs against which material is thrown and a member extending through one of said first mentioned walls and having a portion disposed closely adjacent the ends of said ribs for clearing any obstruction at the ends of said ribs.

In testimony whereof I affix my signature.

JAMES H. MOTT.