M. SCHIEBENDREIN.

WHEAT SCOURING MACHINE.

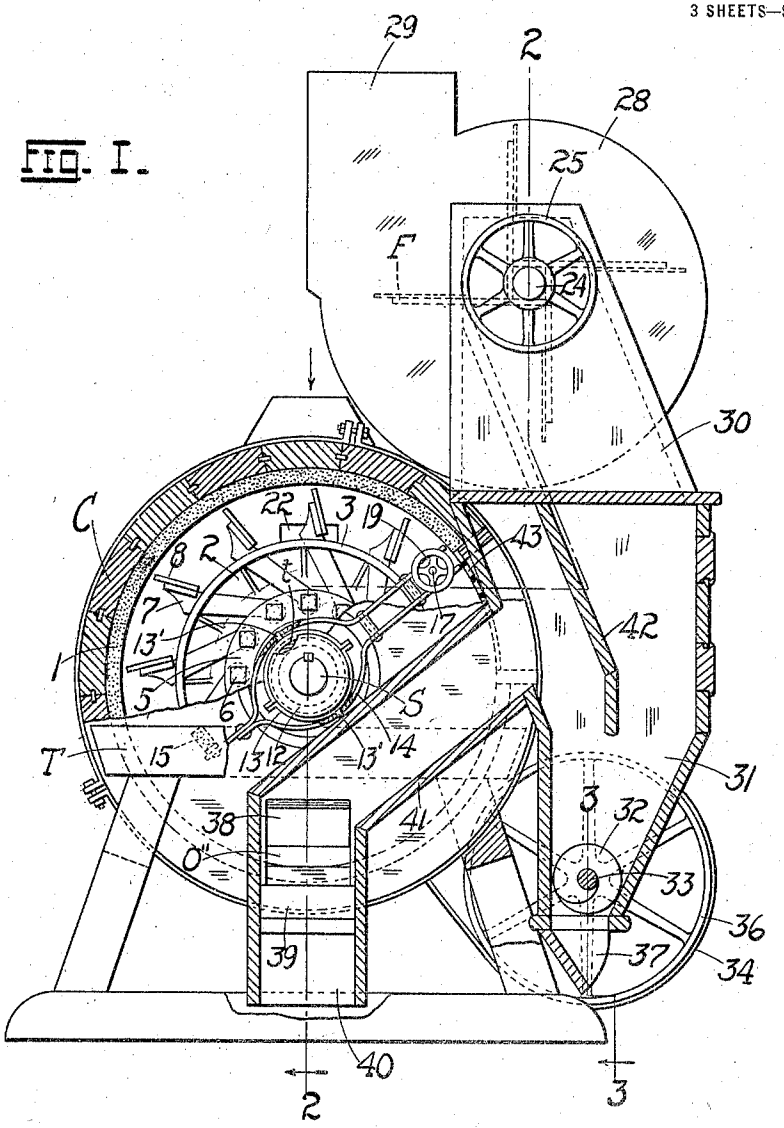
APPLICATION FILED DEC. 14, 1918.

1,307,760.

Patented June 24, 1919.

3 SHEETS—SHEET 1.

FIG. I.



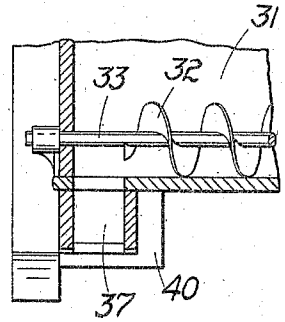


FIG. 3.

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3 SHEETS—SHEET 2.

FIG. 2.

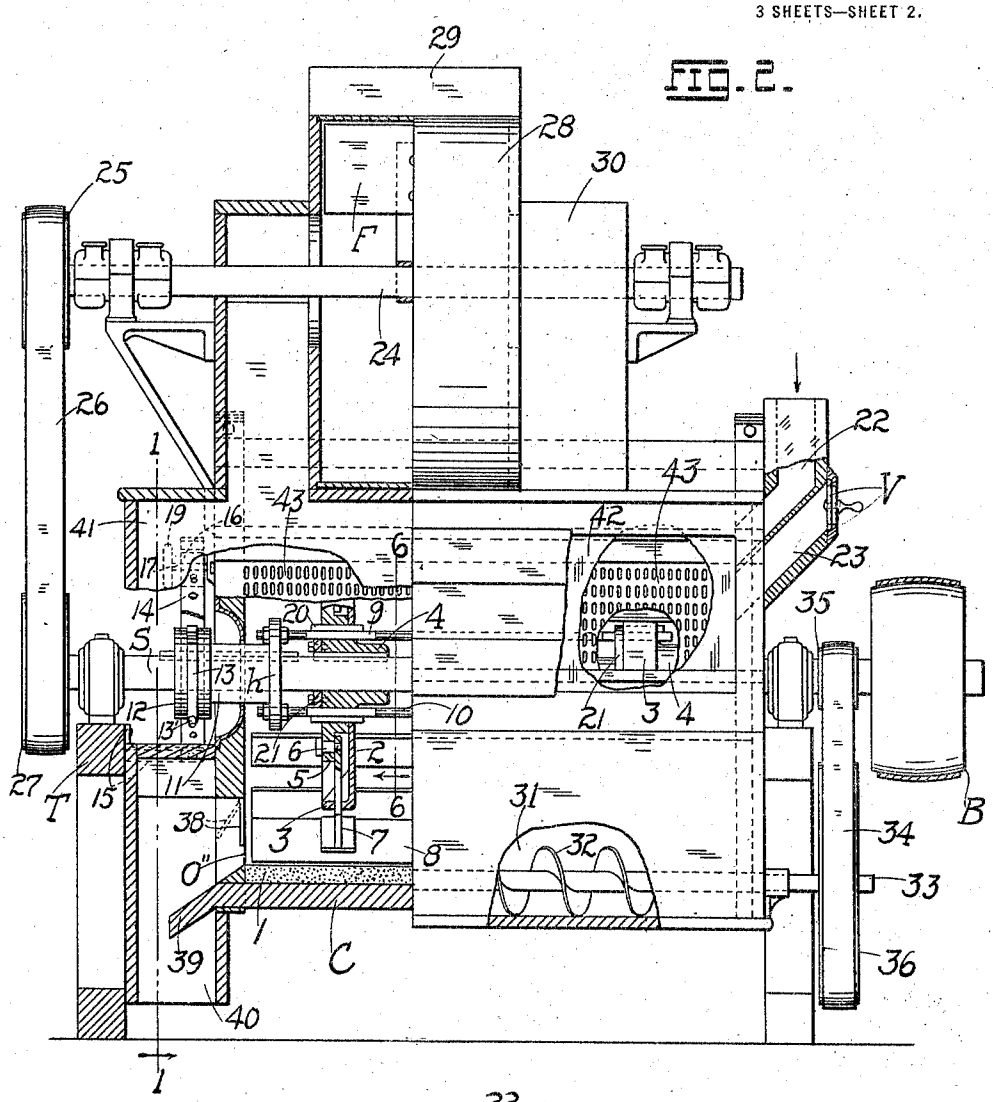
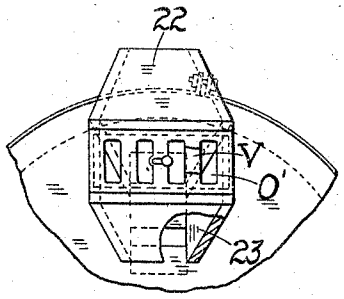


FIG. 4.



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3 SHEETS—SHEET 3.

FIG. 5.

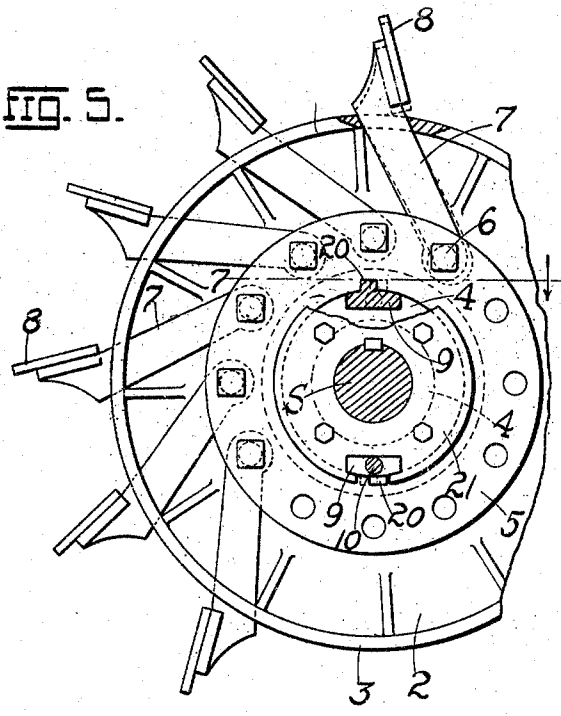
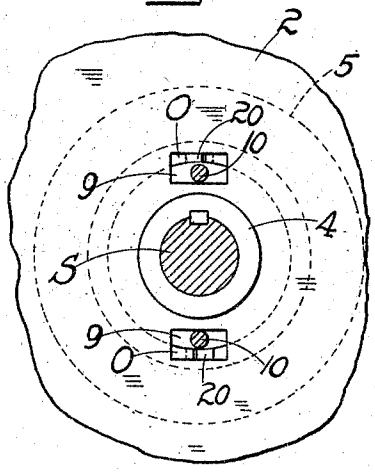


FIG. 6.



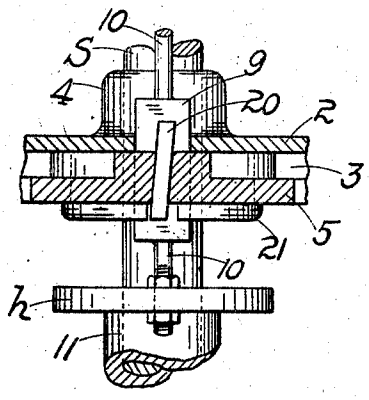
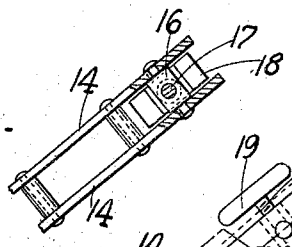


FIG. 7.

FIG. 8.



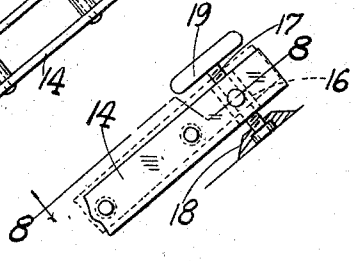


FIG. 9.

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UNITED STATES PATENT OFFICE.

MATYAS SCHIEBENDREIN, OF ST. LOUIS, MISSOURI.

WHEAT-SCOURING MACHINE.

1,307,760. Specification of Letters Patent. Patented June 24, 1919.

Application filed December 14, 1918. Serial No. 266,781.

To all whom it may concern:

Be it known that I, MATYAS SCHIEBENDREIN, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Wheat-Scouring Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

The present invention is an improvement on the structure of wheat-scouring machine forming the subject-matter of a prior U. S. Patent numbered 994,510 issued to me under date of December 28, 1909, and has for its object to provide means for increasing the efficiency of the patented structure to accomplish which, certain features of the old construction have been discarded and others substituted whereby a better control is had both over the character of the final product and the rate of flow of the wheat through the machine. In other respects the improved machine possesses the same advantages and attains the same objects as the patented structure, the specific advantages of the improvements being made apparent from the following detailed description of the invention in connection with the accompanying drawings in which—

Figure 1 represents a vertical transverse section on the line 1—1 of Fig. 2; Fig. 2 is a combined vertical longitudinal section on the zig-zag line 2—2 of Fig. 1, and an elevation of one half the rear casing extension and dust compartment; Fig. 3 is a vertical longitudinal sectional detail on the line 3—3 of Fig. 1; Fig. 4 is an end elevation of the drum or casing showing the feed chute and valve-controlled air chute leading to the casing; Fig. 5 is an end view of the rotor member carrying the beaters with parts in section; Fig. 6 is a vertical sectional detail on the line 6—6 of Fig. 2 showing an inner face view of the terminal disk or head of the rotor; Fig. 7 is an enlarged sectional detail on the line 7—7 of Fig. 5; Fig. 8 is a transverse sectional detail on the line 8—8 of Fig. 9; and Fig. 9 is a side view of the upper end of the shifting lever actuating the rotary ring which controls the beater-supporting arms of the rotor.

Referring to the drawings, C represents an outer cylindrical stationary casing or drum, provided with an inner lining of carborundum 1 or equivalent hard material capable of standing considerable wear. Disposed axially through the casing is a shaft S driven by a belt pulley B, the shaft having secured thereto, at opposite ends within the casing the heads or disks 2, 2, said shaft and disks forming the rotor member of the machine. The disks 2 are provided with marginal flanges 3 and central hubs 4 projecting on either side of the disk, the portions of the hubs on the side of the flanges 3 being the thicker. These thicker portions support suitable rings 5 lying close to the disks and freely rotatable about the hubs. Pivotally secured to the rings 5 by means of bolts 6 are the inner ends of the beater-carrying arms 7, said arms passing loosely and freely through the flange 3 of the rotor disk or head 2 and projecting beyond the flange, an arm on one disk having a corresponding arm opposite thereto on the opposite disk, each pair of arms being connected by a beater or plate 8 extending longitudinally the length of the casing or drum C, the same as in the structure of my patent aforesaid. Operating loosely through suitable openings O formed in the disks 2 adjacent the hubs 4 are the oblong or polygonal portions 9 of suitable longitudinally disposed reciprocable rods 10, 10, there being two such rods diametrically opposite one another, said rods extending at one end beyond the disk 2 where they are secured to the inner terminal flange *h* of a sleeve 11 slidingly feathered to the shaft S, the outer end of the sleeve terminating in a head 12 provided with a peripheral annular groove *t* loosely receiving a split ring 13 provided with diametrically disposed radial pins 13′ passing loosely through the medial looped portion of a shifting lever 14 whose one end is pivoted or hinged to a bracket 15 projecting from the timber T, the opposite end being loosely hinged to a block or nut 16 traversing a screw stem 17 freely rotatable in a bearing plate 18 secured to the head of the drum or casing C, the outer end of the screw being provided with an operating wheel 19. The parts just described are on the order of an ordinary clutch shifting mechanism and no claim is made thereto. It is apparent that by rotating the screw 17 first in one direction and then the other a reciprocating movement will be imparted to the nut 16 and an oscillating movement to the lever 14, the latter imparting a reciprocating move-

ment to the sleeve 11, and hence to the rods 10 and to their polygonal portions or blocks 9. Secured to or formed integrally with the outer faces of the members 9 are splines 20 which are inclined to the rectilinear paths of movement of the members, that is to say they are inclined to the axis of the shaft S and to the rods 10. These splines 20 operate loosely and freely through corresponding inclined passage-ways formed in the rings 5, the portions 9 on the other hand operating freely through the openings O in the disks. It is obvious from the foregoing that a movement of a spline 20 in one direction will necessarily impart a rotary movement to the ring 5 in a given direction, a movement in the opposite direction rotating the ring in the opposite direction. The rings 5 are maintained in proper position on their hubs 4 by the securing rings or caps 21 bolted to the hubs 4, the rings 21 being open sufficiently to allow for the passage of the members 9, 10. Since the rings 5 are simultaneously controlled by the blocks or polygonal portions 9 of the rods 10, both rings will be rotated with any movement of the rods as obvious from the foregoing. A rotation of the rings 5 will necessarily draw in the beater arms 7 when the rings are rotated in one direction (see dotted position in Fig. 5), the arms being forced radially outward when the rings are rotated in the opposite direction. In this way the distance of the beaters 8 from the inner walls of the liner 1 may be carefully adjusted to suit conditions, the radial movement of the arms 7 being facilitated by disposing the same substantially tangentially to the periphery of the rotor head 2 through the flange 3 of which they are guided.

In the structure of my patent aforesaid the grain was advanced through the casing by suitable deflectors disposed on the inner surface of the perforated peripheral section of the casing. In the present improvement these deflectors are dispensed with and in lieu thereof I cause an advance of the grain through the casing by a proper control of the air currents admitted thereto in conjunction with the feed. Thus, in the present embodiment of my invention I provide the casing C at one end with a feed chute or hopper 22, the said hopper having formed in conjunction therewith an air chute 23 to which the air admitted through the openings O′ is controlled by a conventional damper or slide valve V well known in the art, the grain and air discharging simultaneously into the casing C. The air is caused to circulate through the casing by the fan F the shaft 24 of which is operated from the pulley 25 connected by a belt 26 to a pulley 27 on the shaft S. The fan casing 28 is provided with an exit flue 29 as shown. The casing extension 30 is much on the order of that shown in the patented structure the walls thereof inclining to meet the walls of the dust compartment 31 the lower end of which tapers into the form of a hopper (Fig. 1) to catch the heavy particles of the impurities, the bottom of the hopper being provided with a spiral conveyer 32 the shaft 33 of which is driven by a belt 34 passing over the pulleys 35 and 36 carried by the shafts S and 33 respectively. The spiral conveyer 32 discharges its material through the chute 37. The scoured wheat on the other hand discharges through an opening O″ controlled by a hinged valve or apron 38 and passes over a ledge 39 in the outlet flue 40 constituting the lower terminal or discharge mouth of the inclined flue 41. In the present embodiment of my invention the flue 41 is offset from the casing C, thus forming a protection for the lever 14, screw 17 and hand wheel 19 mounted directly behind it. The flue 41 discharges into the chamber 31 behind the deflecting wall 42, this arrangement being somewhat different from the patented structure but not materially so. In the present construction the perforated peripheral section, plate or sieve 43 is not unlike that of the patented structure and serves the same purpose, to-wit, to permit the passage therethrough of the chaff, straw, beards and other impurities separating from the grain and sufficiently broken up to pass through the meshes of the sieve. In the present structure there is a direct coöperation between the valve-controlled air chute 23 and the radially adjustable beater arms 7 (and their beaters 8). If the grain does not pass through the machine at proper speed the valve V is opened sufficiently to permit the necessary influx of air to the casing, the beaters being accurately set to clean the grain properly to conform to the travel of the grain under any particular rate of air influx. If for example the grain comes through bearded or not sufficiently scoured, the air is admitted in reduced quantities to the chute 23, and the beaters properly adjusted to more thoroughly beat the grain. On the other hand if the grain has been scoured too much, this may be due to either an undue outward adjustment of the beaters or to an insufficient influx of air from the chute 23 indicating that the grain passed through the machine too slowly. In that case more air would be admitted to the chute 23 to propel the grain through the machine at a faster rate and the beaters adjusted so as not to scour so hard. Thus between the chute 23 and the radially adjustable beaters we can bring about any desired results.

The operation of the machine is substantially as follows: Rotation being imparted to the drive shaft S, the fan F and conveyer 32 will be driven through the connections

previously described. The wheat is dumped or fed in at the chute 22 which is at the inlet end of the casing, whereupon the rotating beaters or blades 8 will rub the grain against the surface of the carborundum liner 1, the length of time during which the grain remains in the casing depending on the intensity or volume of influx of air into the casing through the chute or conduit 23 as previously described, and the degree of scouring depending both on the rate of air influx and on the degree of radial adjustment imparted to the beaters 8. As the grain is carried around between the beaters or blades 8 and the lining 1, the chaff, straw, beards and other impurities become separated from the grain, and broken up sufficiently to pass through the reticulated or perforated plate or sieve 43, and are drawn up by the suction of the fan around the deflector 42 through the compartment 30 and through the fan casing and out through the discharge flue 29, the cleansed and scoured wheat dropping through the opening O'' onto the ledge 39 and out through the discharge mouth 40 where it is caught in any suitable receptacle (not shown). As the scoured wheat travels along the ledge 39 any light particles accompanying the same will be drawn up through the flue 41 past the deflector 42 through the dust chamber 31 and into the fan casing 28 and out; and finally such particles as escape the rising air currents on account of increased weight will drop down to the bottom of the compartment 31 whence they are discharged by the spiral conveyer 32 toward and into the chute 37 and disposed of in any suitable manner. The tangential disposition of the blades or beaters in the present structure offers the same advantages as it does in the patented structure; and as to the arms 7, their tangential disposition permits the rotatable rings 5 to control them to better advantage, an arm disposed tangentially responding more readily to the rotary movement of the ring than would an arm disposed radially. It will be observed that the operator by turning the wheel 19 can oscillate the lever 14 while the rotor of the machine is running, thereby imparting the necessary oscillation to the lever 14 which in turn reciprocates the rods 10 and blocks 9, and splines 20 by which the rings 5 are rotated. In this way an adjustment of the beaters may be effected without stopping the machine. The scourer in the present improvement may be considered as composed of the rotor or the relatively stationary member, and the rings 5 which constitute the movable or adjustable member. Features shown but not alluded to are well understood in the art and require no description in the present connection.

Having described my invention what I claim is:

1. In a grain scouring machine, a suitable cylindrical casing having inlet and discharge means for the grain, and provided with a perforated peripheral section for the escape of dust-laden air, air moving apparatus for causing an air circulation through the casing, a shaft disposed about the axis of the casing, a scourer on the shaft comprising a rotor member free to revolve about the axis of the shaft, an adjustable member on the rotor having a movement independent of the rotary movement of the rotor but revolving in conjunction therewith, beaters exterior to said adjustable member and sweeping in proximity to the inner surface of the peripheral wall of the casing, and arms hinged to the adjustable member and coupled to the beaters for regulating the distance of the beaters from the aforesaid wall of the casing.

2. In a grain scouring machine, a suitable cylindrical casing having inlet and discharge means for the grain, and provided with a perforated peripheral section for the escape of the dust-laden air, means for causing a circulation of air through the casing, a scourer in the casing comprising a shaft disposed along the axis of the casing, disks on the shaft spaced a suitable distance apart, rings disposed about the shaft adjacent to the disks and capable of a rotary adjustment about the axis of the shaft, arms hinged to the rings and leading outwardly therefrom in a direction substantially tangent to the peripheries thereof, means on the disks for guiding said arms, beaters on the outer ends of the arms, and means under the control of the operator for imparting rotary adjustments to the rings and corresponding radial adjustments to the beaters.

3. In a grain-scouring machine, a scourer comprising a shaft, disks mounted thereon and spaced apart, said disks having outer flanges and central hubs, rings mounted rotatably on the hubs adjacent the disks, beater arms leading tangentially from the rings and hinged thereto and operating freely through the flanges, and projecting a suitable distance beyond the same, and means disposed along the shaft for imparting rotary movements to the rings and consequent radial adjustments to the free ends of the beater arms.

4. In a grain-scouring machine, a scourer comprising a shaft, disks mounted thereon and spaced apart and provided with hub portions, rings mounted rotatably on the hubs adjacent the disks, longitudinally reciprocable rods disposed between the disks and provided with polygonal portions

loosely traversing the disks, splines on said polygonal portions disposed at a slight angle to the axis of the shaft and freely traversing correspondingly inclined slots in the rings, whereby with a reciprocation of the rods in either direction the rings will respond rotatively to said reciprocations, beater arms hinged to the rings and leading outwardly therefrom in substantially tangential directions, and means on the disks for guiding said arms, the free ends of the arms having imparted thereto a radial adjustment with the rotary movements of the rings aforesaid.

5. In a grain scouring machine, a scourer comprising a shaft, disks mounted thereon and spaced apart and provided with hub portions, rings mounted rotatably on the hubs adjacent or in proximity to the disks, longitudinally reciprocable rods disposed between the disks at points diametrically opposite one another and provided with polygonal portions loosely traversing the disks, said rods extending beyond the outer face of one of the disks, splines on the polygonal portions aforesaid disposed at a slight incline to the axis of the shaft and operating freely through corresponding slots formed in the rings for imparting rotation to the rings with a longitudinal movement of the rods in either direction, arms pivotally coupled at their inner ends to the rings and extending beyond the peripheries of the disks, and disposed substantially tangentially thereto, means on the disks for guiding the arms, and beater plates connecting the outer ends of opposite arms of the respective disks, the plates having a radial adjustment imparted thereto to and from the axis of the shaft according to the direction of rotation imparted to the rings.

In testimony whereof I affix my signature, in presence of two witnesses.

MATYAS SCHIEBENDREIN.

Witnesses:
EMIL STAREK,
JOS. A. MICHEL.