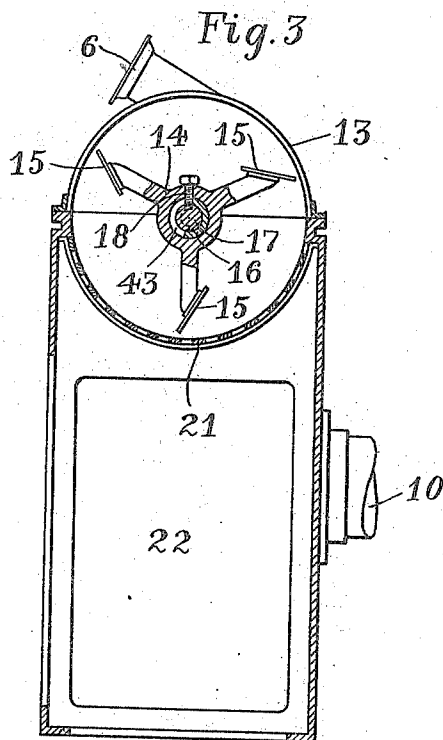
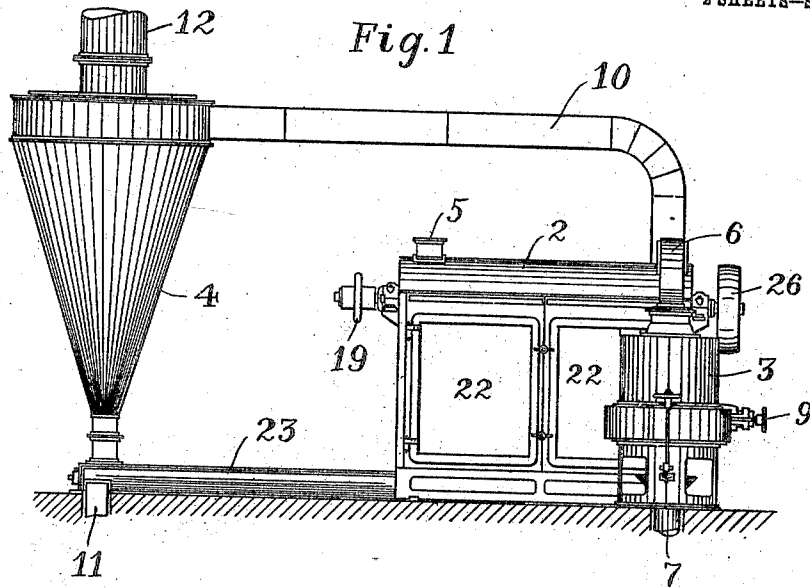


I. STEINER.
GRAIN POLISHER AND CLEANER.
APPLICATION FILED JULY 20, 1909.

951,549.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 1.



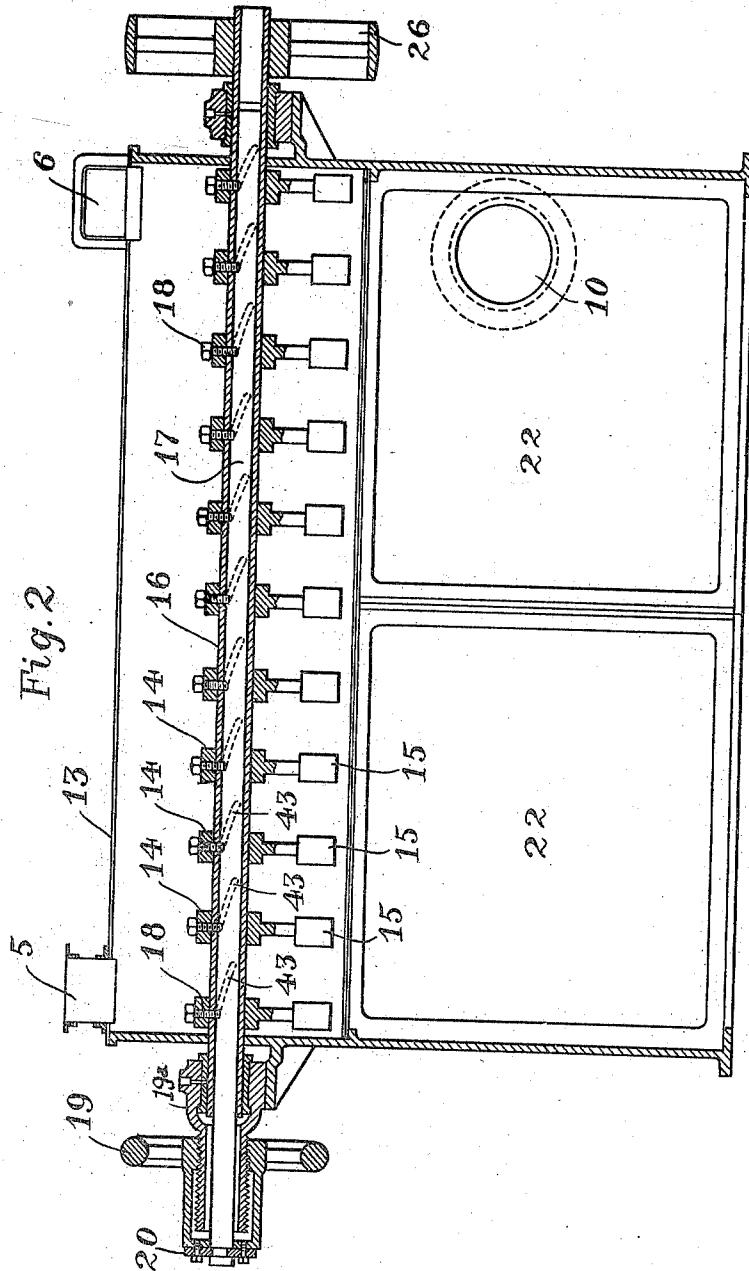
WITNESSES:
David J. Walsh
Albert Steiner.

INVENTOR
Isidor Steiner
BY Howard Deane
ATTORNEY

I. STEINER.
GRAIN POLISHER AND CLEANER.
APPLICATION FILED JULY 20, 1909.

951,549.

Patented Mar. 8, 1910.
2 SHEETS—SHEET 2.



WITNESSES:

David J. English
Albert Steiner.

INVENTOR
Isidor Steiner
BY Howard Deane
ATTORNEY

UNITED STATES PATENT OFFICE.

ISIDOR STEINER, OF MUNICH, GERMANY, ASSIGNOR TO GESELLSCHAFT FÜR STEINER'S MALZ-ENTKEIMUNGS-PUTZ UND -POLIERMASCHINEN MIT BESCHRÄNKTER HAF-TUNG, OF MUNICH, GERMANY.

GRAIN POLISHER AND CLEANER.

951,549.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed July 20, 1909. Serial No. 508,653.

To all whom it may concern:

Be it known that I, ISIDOR STEINER, a subject of the Emperor of Germany, residing at Munich, in the Empire of Germany, have invented certain new and useful Improvements in Grain Polishers and Cleaners, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The invention relates to a machine for removing the combs from, or otherwise treating and cleaning grain, principally malt, and is distinguished from known similar apparatus principally by the fact that the grain, especially malt, is completely freed from the combs, the combs and dust are separated and removed at the same time from the grain to be treated and the latter receives a considerable gloss, which gives it a better appearance, without the grain being damaged in any way.

The machine consists essentially of an apparatus in which the grain to be treated is made to whirl according to a known method by means of arms attached to a rotating shaft so that the combs are separated from the grains, and mutual friction and polishing takes place.

The machine described further possesses the advantage of great simplicity of construction combined with a large capacity, and a small demand for power. Experiments have proved that 6,250 kilograms of malt can be treated per hour at an expenditure of 3 H. P.

In the drawings: Figure 1 is an elevation of a complete plant, including the subject-matter of this application, an aspirator and a dust collector. Fig. 2 is a longitudinal section of the apparatus for removing the combs, and Fig. 3 is a transverse section through the same.

Referring to the drawings, 2 is the apparatus in which the removal of the combs from the grain to be treated is performed, 3 is the aspirator, and 4 the dust collector. These latter are not a part of this invention, and are only given for the purpose of showing the relation of the combs separator to other parts of a complete apparatus.

Apparatus for removing the combs, and similar apparatus provided with striking arms arranged spirally on a rotating shaft

are already known, in which the said arms are attached to the shaft by means of bolts and can be set at different angles to the shaft as required. In this arrangement, however, the single arms are not displaced in a plane normal to the shaft, *i. e.*, the angles which the arms make with each other are not altered, so that the obliquity of the spiral surface formed by the arms is unchanged. This is therefore merely a case of displacing single elements of the spiral surfaces formed by the striking arms, without changing the obliquity of the surfaces in any way. The result of this is that by displacing the single arms, only the speed can be altered with which the malt or the like particles leave the arm in question, and not the speed with which the grain to be treated passes through the whole drum, as the latter speed only depends on the obliquity of the spiral surface and not on the angle (which might be varied), which the single parts of the spiral surfaces make with each other.

The essence of the improvement in the apparatus for removing the combs and polishing the grain, which improvement forms the subject-matter of the present invention, consists in arranging rotatively in their own planes, the arms or rings of arms mounted on the shaft, in such a way that, by displacing the same relatively to one another, the obliquity of the spiral surface formed by the striking plates can be altered, and thus the speed of the malt or the like through the apparatus can be regulated.

The apparatus for removing the combs and for polishing the grain, shown in Figs. 2 and 3, consists of a horizontal cylinder 13, in which a number of arms 14 provided with striking plates 15, are set at an angle with each other on a shaft, each of them being capable of displacement in its own radial plane, so that according to the angle made by the arms with each other, a variable obliquity of the spiral surfaces can be obtained, and therefore a more or less rapid and intense treatment of the grain.

In order that the setting of the arms may be carried out while the machine is working, the arms 14, provided with striking plates 15, are arranged rotatively and radially on the hollow shaft 16, within which is disposed a shaft 17 provided with

grooves 43 of different obliquities, and capable of axial movement. Pins or the like 18 are provided on the bosses of the arms 14, engaging in oblique grooves in the shaft 17, so that on axial displacement of the inner shaft 17 within the hollow shaft 16, the single arms or rings of arms are turned through different angles. As the obliquity of the spiral surfaces formed by the several striking plates is hereby increased or diminished, the speed of traversing, and therefore the degree of removal of the combs, and of polishing the grain, can be varied at will, as required, while the machine is running. The axial displacement of the inner shaft 17 within the hollow shaft 16 is effected, by way of example, as illustrated, by means of a hand wheel 19 capable of axial displacement through the medium of a screw-thread on the outer surface of a sleeve-like member 19^a carried by the frame and inclosing the end of the hollow shaft 16, a ring 20 on the hand-wheel engaging in a groove in the projecting end of the inner shaft. The lower semicircular part 21 of the cylinder is perforated, so that the coarser particles of the combs fall immediately into the receiver 22 (Figs. 2 and 3), formed by the frame. They can be directly removed from these receivers, or conveyed to an outlet pipe, as 11 (Fig. 1). The perforation of the under side 21 is not absolutely necessary. If the perforations are absent, all the particles of the combs reach the aspirator 3, and are thence conveyed to the dust collector 4, where they are separated from the air current.

The shaft provided with striking arms 14 is shown as driven by a belt pulley 26, and the refuse, or coarser portions falling through the perforations 21 can be removed through an outlet pipe 10. 5 is the orifice for feeding in the grain, and 6 a pipe by which it can be connected with an aspirator.

Having thus fully illustrated and described my invention, what I claim, is:

1. In a machine for scouring grain, an

outer cylinder, a hollow shaft lying there-within carrying striking plates arranged 50 rotatably thereon, a shaft within said hollow shaft provided with grooves of different obliquity, pins projecting from the bosses of the striking arms into the grooves on the inner shaft, in combination with 55 means for displacing the inner shaft longitudinally and thereby all the striking plates simultaneously.

2. In a grain polisher and cleaner, a hollow shaft, arms carrying striking plates 60 mounted thereon, a shaft arranged within the hollow shaft and provided with grooves of different obliquities, pins attached to the arms and engaging the grooves on the inner shaft, in combination with means for axi- 65 ally adjusting the inner shaft while the machine is running.

3. In a grain cleaner and polisher, a rotatably mounted hollow shaft carrying arms provided with striking blades, a second 70 shaft located within this hollow shaft and provided with grooves at different angles to each other, pins attached to the arms and engaging the grooves on the inner shaft, in combination with a hand-wheel connected 75 to the end of the inner shaft and displaceable axially relative to the outer shaft.

4. In a grain cleaner and polisher, a rotatably mounted hollow shaft carrying arms provided with striking plates, an axially 80 movable shaft inclosed within the hollow shaft having cut upon its surface grooves at different obliquities to the radius and to each other, projections attached to the arms and engaging the grooves, a threaded mem- 85 ber inclosing the end of the hollow shaft, a ring engaging the end of the inner shaft, in combination with a hand-wheel on said threaded member axially movable with respect to the hollow shaft and by means of 90 the ring displacing axially the inner shaft.

Dated this 6th day of July 1909.

ISIDOR STEINER.

Witnesses:

LOUIS MUELLER,
MATHILDE K. HELD.