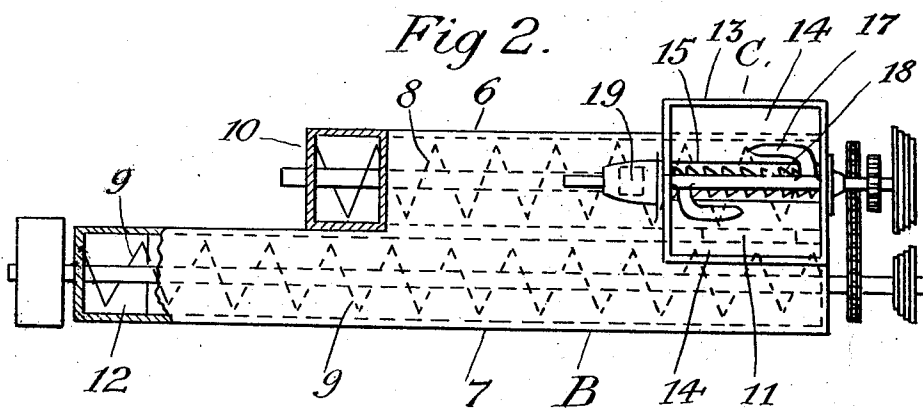
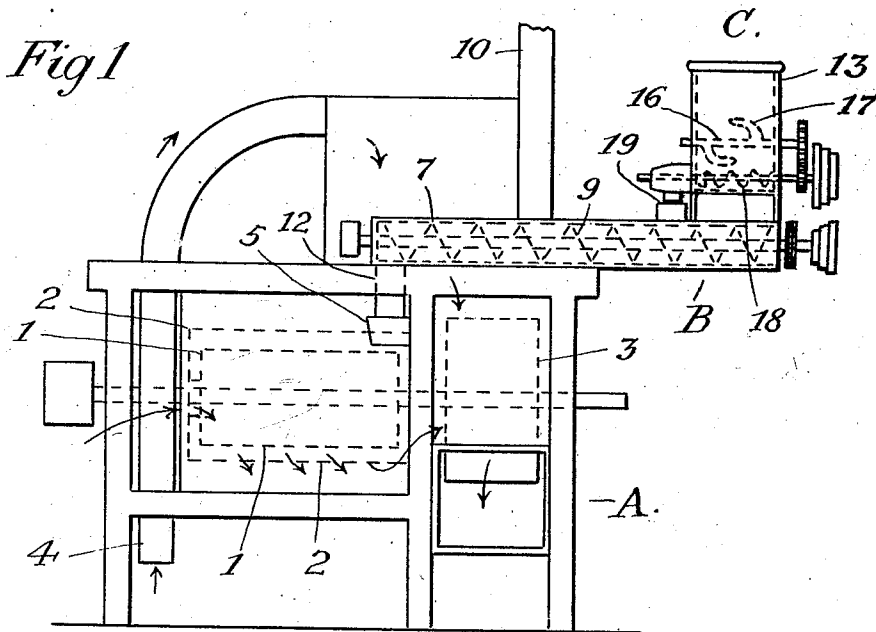


No. 842,116.

PATENTED JAN. 22, 1907.

W. R. REID.
PROCESS OF CLEANING GRAIN.
APPLICATION FILED DEC. 30, 1905.



UNITED STATES PATENT OFFICE.

WILLIAM R. REID, OF SLEEPY EYE, MINNESOTA.

PROCESS OF CLEANING GRAIN.

No. 842,116.

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed December 30, 1905. Serial No. 294,032.

To all whom it may concern:

Be it known that I, WILLIAM R. REID, a citizen of the United States, residing at Sleepy Eye, in the county of Brown and State of Minnesota, have invented certain new and useful Improvements in the Processes of Cleaning Grain, of which the following is a specification.

My invention relates to a process or method of cleaning wheat and other grain preparatory to milling it into flour and other cereal food products, and particularly to the method or process of removing smut and other adherent extraneous matter from the grain-berries by means of a fine dry powdered substance applied to the grain and afterward separated therefrom and removed together with the smut and other foreign matter by scouring and air-current operations.

Practical experience has demonstrated that smut and some other adherent foreign substances cannot be satisfactorily removed from wheat by the scouring processes in common use, for the reason that as such substances are of a somewhat greasy nature the frictional contact of the grains with one another and with the scouring devices serves merely to polish their contact-surfaces and causes such substances to impart a gloss and stick tighter to the grain.

The object of my invention is to provide a simple and effective method of completely separating and removing such matter from the grain.

In carrying out my process I may use any dry finely-powdered substance that serves to coat the grains without injury to them; but I prefer to use thoroughly-conditioned pulverized and sifted dry slaked lime. The powder may be introduced to the grain in any suitable way, as by means of a spout or ordinary feeder; but I prefer to introduce it to the grain in a mixing-chamber in the manner hereinafter set forth. The grain and powder should be thoroughly mixed in the chamber by agitation or otherwise and the powder-coated grain conducted thence into an ordinary grain-scourer or other grain-cleaning machine and subjected to the rubbing and scouring action of such machine and to the air-currents employed therein, whereby the powder, together with the smut, is separated from the grain and conducted away from the machine. In this operation the frictional contact of the powder-coated grains with the

scouring devices and with one another separates the coating mixture of powder and smut or other adherent foreign matter from the grain, and the air-currents in the machine conduct the separated matter away from the machine, leaving the grain clean and in condition for use in making flour and other food products.

In carrying on my process I prefer to use the apparatus illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the feeder, the mixer, and the scourer, which constitute the machines employed; and Fig. 2 is a plan view, partly in section, of the feeder and mixer.

In the drawings, C designates the feeder, B the mixer, and A the scourer. The scourer shown in outline is the well-known "Eureka" machine, in which the grain is subjected to the action of beaters or brushes in its passage through the annular space between the two cylinders 1 and 2 and at the same time is subjected to the action of air-currents introduced into the space between the cylinders and discharged through openings in the outer cylinder by the suction of the fan 3. The grain is also subjected to an upward air-current in discharging from the machine through the spout 4. The courses of these air-currents are indicated by arrows. The grain enters the scourer from the mixer through the hopper 5.

The mixer comprises two relatively long and narrow troughs or boxes 6 and 7, in which are screw-conveyers 8 and 9, arranged to conduct the grain in opposite directions in their respective troughs. The grain is fed into the shorter box 6 by a spout 10 and is conducted by the screw 8 toward the right to an opening 11 between the troughs, where it passes into the trough 7 and is conducted by the conveyer 9 therein to the discharge-spout 12, which drops it into the hopper 5 of the scourer.

The feeder comprises a hopper or box 13, having downwardly-converging cant-boards 14, which provide a relatively narrow and long opening 15 for feeding the powder into the mixer. In the hopper is a rotary shaft 16, carrying agitators or stirrers 17 for keeping the powder in loose condition, and beneath the opening 15 is a screw conveyer 18 in a narrow chamber for conducting the powder from the feed-box to the mixer. As

shown, the feeder is arranged over the mixer in position to cause the powder to be fed into the conveyer-trough 6 through a spout 19.

In operation the feed-box is kept supplied with powder in dry condition, and as grain is supplied to the mixer-trough 6 and carried along by the conveyer 8 the powder in proper quantity is fed to it through the spout 18, and the mixture of grain and powder is moved along to the opening 11, through which it is forced into the box 7. Here the material is engaged by the oppositely-moving conveyer 9 and is thoroughly agitated to coat the grain with powder as it is being conducted to the spout 12, leading to the scourer.

It will be noted that in conducting the process in the manner described the grain is continuously advancing in a tumbling mass under mutual attrition from the time the powder is applied until the grain is discharged from the scourer. Hence this method of cleaning the grain occasions no delay to the usual milling operations, for the treatment is effected while the grain is pursuing an uninterrupted course from the bin to the reducing-machines, and it is desirable to keep the grain in constant movement or agitation from the time the powder is introduced to the mixer until the cleaned grain is discharged from the scourer.

In practice the proportion of powder to grain used to effect good results will vary somewhat according to the kind and condition of the material and the thoroughness of the mixing and the scouring; but I would recommend under average conditions the use of from about one bushel to one barrel of fine or other powder to about four hundred bushels of grain. If lime is used, it should be thoroughly conditioned by slaking, cooling, and sifting before it is used, and only the fine dry powder used.

While I have specifically mentioned lime and prefer to use it alone in carrying on my process, I do not wish to limit myself to the use of lime or any other specific substance or

mixture of substances beyond the limitation that the substances included are such as will not injure the grain-hulls in the practice of the process.

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

1. The method of removing from grain smut and other impurities, which consists essentially in commingling with a mass of grain while continuously advancing and under mutual attrition, a dry finely-powdered material, adapted to coat the berries, and subjecting such advancing mass to the action of a scourer, and of an air-current adapted to carry away the detached fine particles.

2. The method of removing from grain smut and other impurities, which consists essentially in commingling with a mass of grain while continuously advancing and under mutual attrition, dry finely-powdered slaked lime, and subjecting such advancing mass to the action of a scourer, and of an air-current adapted to carry away the detached fine particles.

3. The step in the process of removing from grain smut and other impurities, which consists in commingling with a mass of grain while continuously advancing and under mutual attrition, a dry finely-powdered material adapted to coat the berries.

4. The steps in the process of removing from grain smut and other impurities, which consists in commingling with a mass of grain while advancing and under mutual attrition, a dry finely-powdered material, and advancing and agitating the commingled mass of grain and powder until the berries are coated with the powder.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of December, 1905.

WILLIAM R. REID.

Witnesses:

SAM GETHUS,
A. HENNINGSEN.