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PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in Apparatus for Washing, Husking and Polishing Wet Grain.

I, STEFAN STEINMETZ, of Gerichtstrasse 23, Berlin, N. 39, Germany, and of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

For husking wet grain in one series of operations, hitherto numerous and complicated machine-elements have had to be depended upon because the water is simultaneously removed, lubrication of the grains is hindered, and finally the husked grains must be converted into the dry condition.

According to the present invention a simple method of attaining the desired end is disclosed. Devices which have hitherto been employed separately are now employed, so to speak, grafted into one another, whereby the grain is made sufficiently wet but not too wet, and on the other hand lubrication of the grains and of entire mechanical plant are effectively provided for and the grain can pass through the series of operations very much more quickly.

This invention will be more fully described with reference to the drawing, which shows a suitable apparatus by way of example. In the drawing

Figs. 1 and 2 show diagrammatically a side and a longitudinal elevation respectively of the entire husking apparatus (the latter elevation being partly in section).

Fig. 3 is a vertical section on the line X—X in Fig. 2 and

Fig. 4 a sectional view of a modified form of husking drum which may be employed.

To make clear the invention it will
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suffice to explain the apparatus in conjunction with its mode of operation.

The grain, mixed with water in any suitable manner (possibly by the admission of water at a^1) passes from a into a conical, stationary drum b , the larger end of which is on the admission side, and within which a screw-like beating member c rotates (see Fig. 1); the threads of this beater extend parallel to the wall of the drum and therefore taper towards the outlet d correspondingly to the conical form. The screw-like beating members c might be replaced by straight beating members such as are commonly used in known centrifugal machines (see Fig. 2).

Water is flung through the strainer bottom e into the trough e^1 below it, the just described arrangement of conical housing preventing free water being carried on with the grain. At f is indicated an outlet for the water which collects in the trough e^1 . At the same time this arrangement allows water to accumulate in the drum until about the height of the enclosed outlet duct f ; out of the drum the first thread of the beater, *i.e.*, that of the largest diameter, can then always draw fresh water, this being specially of advantage in the treatment of hard grain in order to be able to wash the same very effectively and to moisten it well.

As however there is no danger that free water reaches the outlet g , uniform moistening of the grain is provided for, which is necessary in order to permit full saturation of the husks with water so that in the following stages of the process they can be the more easily released from their cores.

The husking drum h , which remains

continuously in communication with the upper wash-drum *b* by way of the outlet passage *g* has, running within it, the blade-system *i*, and the adjoining polishing drum a similar blade-system *k* to which systems is allotted in a novel manner the double duty of accelerating with very great efficiency the removal of the husk from, and subsequent polishing of the grains. The drum *h* which may be cylindrical consists, both at its entire periphery and throughout its entire length, of a closed sheet of metal, from which no water can escape. The blade-systems *i* and *k* are composed of two elements which, mainly owing to their different positions relatively to the rotary axis, have different duties. These two elements are the surfaces *l* and *m* which preferably follow one another alternately. The flatter blade surfaces *l* serve to press the grains against the drum *h* and the steeper surfaces *m* effect a rapid removal of the moistened grain, of which removal the pressure surfaces *l* are insufficiently capable owing to their positioning being more favourable for exerting pressure. The blade systems *i* and *k*, though spatially separated from each other, may be similarly constituted as above described, one system *i* serving purely as husking roller and the other *k* as after husking or polishing discs. Fig. 4 shows a modification of such a husking or polishing roller.

In order to render the transference of the husked grain from the husking drum *i* to the polishing drum *k* uniform, it is convenient to arrange between the two drums a distributing blade system *r* for accelerating the entry into the second drum, so that the mixture of still moistened grain and loose husks has no opportunity to be deposited on the bottom of the drum *k*.

While the husking and polishing is executed by the rollers *i*, an air current passes in known manner through the duct *n*, being drawn away by the suction fan *o*, whereby the grains withdrawn are deposited in the chamber *p*, wherefrom they can be conveyed away by the worm *q*.

In consequence of the above described combination of various elements, known *per se*, for moistening husking, polishing and finally drying the grain in a com-

paratively very, small space, possibility being however afforded to set up the various machine elements separately, the cores of the grains can absorb no moisture, which is very advantageous when it is considered that thereby the grinding apparatus may be directly connected to the machine.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Apparatus for washing, husking and polishing grain in one series of operations, characterised by this, that the grain is driven towards the tapering end of a conical washing drum (as *b*), the lower half (as *e*) of which is perforated in the manner of a sieve, in which drum a beating member (as *c*) rotates and below which drum is adjacently mounted a trough (as *e'*) wherefrom the beating member (as *c*) can continually draw fresh water, the moistened grains passing from the washing drum (as *b*) directly into a drum (as *h*) in which bladed devices rotate for loosening and freeing the husks from the grains and for subsequently polishing the latter.

2. Apparatus according to Claim 1, characterised by the bladed devices which rotate in the drum (as *h*) comprising blades (as *l, m*), some of which are steeply inclined (more or less radial) and some flatly inclined (more or less tangential) with respect to the periphery of the drum.

3. Apparatus according to Claims 1 and 2, characterised by this, that, between the two beating devices respectively for husking and for polishing the grains, indrawing blades (as *r*) are arranged at the place of transfer from one device to the other.

4. Apparatus for washing, husking and polishing wet grain, constructed or operating substantially as described with reference to the accompanying drawing.

Dated this 13th day of September, 1921.

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[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 1.

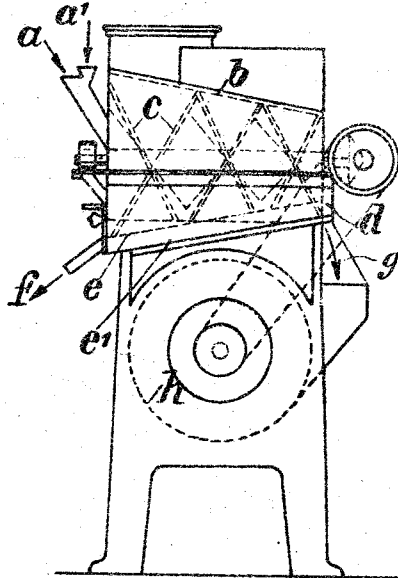


Fig. 2.

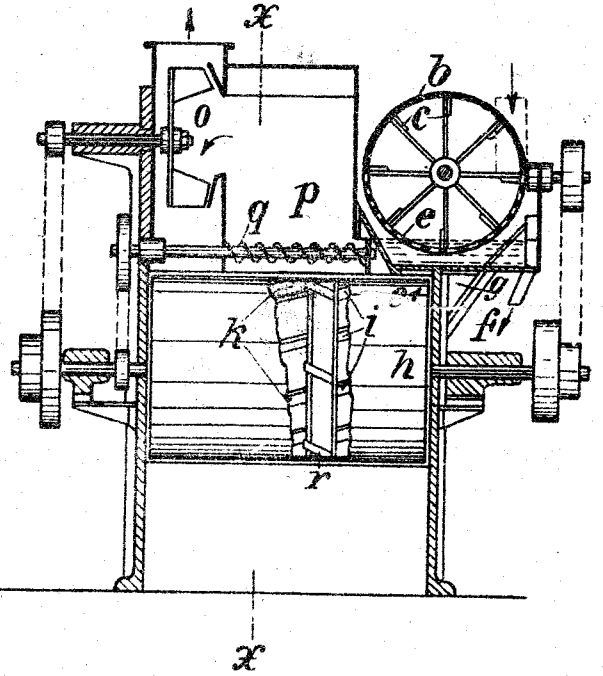


Fig. 3.

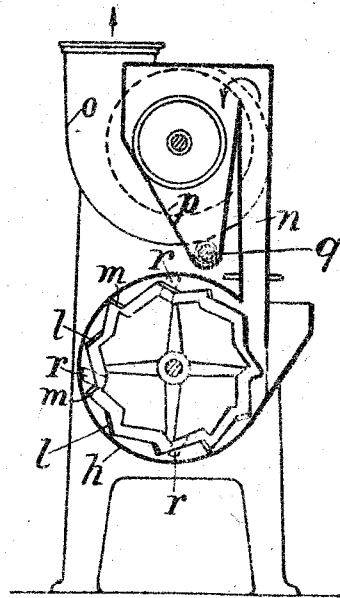


Fig. 4.

