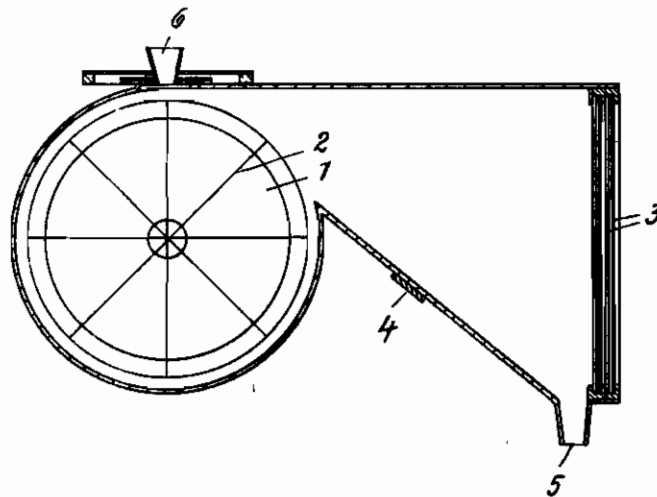


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PROCESS FOR THE DEGERMINATION OF SEED
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PROCESS OF AND EQUIPMENT FOR THE DEGERMINATION OF SEED, IN PARTICULAR SEED OF INDIAN CORN (MAIZE)

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Rhein, Germany; vested in the Alien Property
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The embryo or resting germ of a grain of seed, as a rule forms such a unit with the endosperm, especially in the case of maize, that it can only be removed with the aid of special processes and devices. The processes of degermination, which have been known up to now, generally consist in that the grain of seed are brought into contact for a short period with water, steam or air saturated with water, whereby the resting germ develops a quicker and more intense swelling action than the endosperm. The premature swelling of the resting germ, which is caused by this treatment, will result in differences in toughness existing between the substance of the germ and the endosperm, and in a considerable increase in size of the resting germ which will be lifted-off from the endosperm, thereby a possibility will then be offered of separating the germ by mechanical devices, e. g. by means of brushing mills and husking machines, or by a disintegrating equipment with sifting and cleaning machines installed subsequent thereto. The brushing and husking machines are chiefly used in such cases, where the seed has already passed a pre-swelling operation in water, whereas the disintegrating apparatus with a subsequent equipment of sifting and cleaning machines will be resorted to, where merely a pre-swelling operation has been previously performed by way of a treatment with steam.

The treatment of seed, in particular maize, with water, steam or air saturated with water vapour, implies the drawback that processes resulting in rancidity, especially such processes of this character, as are due to enzymic action within the oily components of the germ substance, will be enhanced, and that, as a consequence thereof, inferior oils will be supplied by the germs separated for the extraction of oil. This applies to a particularly high degree to the so-called wet process, in which the extraction of oil must be carried through without delay, because in default thereof the substance of the germ will become spoilt in consequence of the formation of mildew and of processes of germination.

The so-called steaming process with subsequent degermination in grinding mills implies the drawback that frequently the grains of seed are ground to pieces together with the germs, which fact will result in losses of germ substance obtaining. As furthermore by this degerminating method groats with ground-up germ substance and undisintegrated germs are supplied, the subsequent sifting and cleaning processes are

rendered more difficult, and the yield of oil will be reduced.

The present invention has for its primary object a new process under which the degermination takes place in the dry state, that means without any use of water, vapour of water or air saturated with water, and in a simple and complete manner.

More particularly, this new method consists in that the grains of seed, especially maize, are brought into a vehement contact with a hard and smooth wall; so, they may be thrown against such wall, or are given a blow by means of such a wall.

A further object of this invention consists in suitable devices for realizing the above process. So, preferably an apparatus will be used, which consists of a drum with blades rotating within a casing, which drum is placed opposite to a wall possessing a smooth and hard surface, which is hit by the material thrown away from the drum. The wall can be arranged exchangeably, and two walls can, for instance, be inserted one behind the other, in such a way as to be removable from the casing. A plurality of such husking devices can also be installed for joint operation one behind the other.

The above and other details of the invention can be taken from the annexed drawing which illustrate an embodiment of the invention, particularly suitable for the degermination of maize. The husking apparatus consists of drum 1, which is provided with blades 2 arranged around its circumference, and which rotates within a cylindrical case, and of the bumping walls 3, which are arranged in direction perpendicular to the direction, in which the material thrown away from the drum will be reflected by said walls. The cylindrical casing, within which the drum 1 rotates, is provided at a suitable point of its circumference with an aperture to which a sheet metal casing is connected; this latter casing is closed on the side opposite to the aperture by the bumping walls 3, and has a bottom plate inclined towards the discharge opening 5. Plates of glass are used as bumping walls and are exchangeably arranged one behind the other, they can be withdrawn from the casing. A charging device 6 is provided in top of the cylindrical part of the case.

The grains of seed dropping on the drum from the funnel, are caught by the quickly rotating blades of the drum, and are thrown on to the glass plates.

Preferably a plurality of such husking devices

are combined so as to form one apparatus in such a way, that the individual devices are arranged one above the other, and more exactly in such a manner that the material dropping from one of the devices, will immediately be fed to the device placed immediately underneath the first one.

The plate of glass which has been withdrawn and cleaned, if necessary, will thereupon be reinserted behind the second glass plate. In the place of plates of glass it is also possible to install a circular disk or a cylinder which slowly rotates and adjoins, as well protected against the penetration of dust, as possible, the aperture opposite to the bumping wall, wherefore an opportunity exists of automatically cleaning, the disk or cylinder, as soon as it emerges from the apparatus, so that always a clean bumping wall will enter the equipment.

In this manner germs are obtained, which to a very high degree have been cleaned of groats and flour, and which upon being worked in a press, will yield an oil having an acid figure which is so small that in the plurality of cases it will be possible to use this oil directly in its undiluted condition as an edible oil.

It has, moreover, been ascertained that the germ of maize thus obtained, and the oil extracted therefrom by a cold-pressing operation, respectively, contrary to the statements in literature, has, for instance, vitamine E exceed those of, the well known natural products containing vitamine E.

The dry grains of seed, in particular grains of maize, which under the present process are projected against a bumping wall, or are given a blow means of a smooth and hard wall, will be disintegrated so as to split into coarse pieces of groats, which are frequently sharp-edged, and into almost intact germs, whereas under the processes known up till now for the degermination of seed, the endosperm of the grains and the germs separated therefrom are ground-up to a high degree.

The degermination of seed, in particular maize, is preferably carried through in such a way that between the individual drum casings cleaning devices, having the shape of so called ascension sifters, are installed, which separate the already detached germ from the perfectly degerminated

groats. In this manner a careful treatment of the germs will be realised, and it can be prevented that the subsequent drum cases are charged with seed grains which already have been perfectly degerminated, and with already separated germs.

The splintery mixture of groats and germs is, in doing so, classified in accordance with its specific weight within a certain system of tube by means of a strong current of air which can be produced by an exhauster. In view of the fact that the germ of seed, in particular maize germs, will always be lighter in weight than the splintery groats of the flour substance, it is possible to separate them quantitatively in this manner. Thanks to the great quantity of air used for this purpose, the water contents of the seed germs, which by their nature possess a high degree of humidity, especially as far, as maize germs are concerned, are, moreover, at the same time reduced to such a little percentage, that thereby it will become admissible to store for a certain period of time the pure germs of seed, which are thus obtained, in particular germs of maize, and to ship them, respectively, without any danger of the oil contained therein, becoming rancid.

For the sake of greater simplicity it is, however, also possible to install the ascension sifter only later on in the degermination set, when the seed, in particular maize, has already been passed through all of the drum cases, and after the splintery groats obtained have, if necessary, been freed, together with the germs, of all residues, if any, of coarse groats to which the germs are still attached, this being done by means of an assorting drum.

The remaining groats which are degerminated, possess a higher degree of storing capacity, as compared with a seed which has been ground to groats together with the substance of the germs, because this substance of the germs, which is liable to get spoiled, is absent in them. Groats which have been degerminated in this manner, can be stored in high-type silos, whereas maize groats with germs could only be stored hitherto as layers up to a height of 2 meters as a maximum.

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