Inventor

Charles Droin,

by Chatwin and Co.

Attorneys.
UNITED STATES PATENT OFFICE

CHARLES DROIN, OF MOLAY, NEAR ANNAY SUR SEREIN, FRANCE

APPARATUS FOR SEPARATING IMPURITIES FROM GRAIN

Application filed November 5, 1926, Serial No. 146,802, and in Belgium November 9, 1925.

The invention relates to apparatus for separating from granular materials, impurities which have more or less the same dimensions and weights as the said materials but are less resistant to crushing; and concerns more particularly (because it is in this case that its application appears to be of greatest interest) but not exclusively, amongst such apparatus, those for separating from the grains of wheat, garlic, black grains of wheat which are not capable of being used for flour which are mixed therewith.

It has for an object particularly to permit of constructing such apparatus so that they shall be of simple construction and efficient and rapid in action.

It consists chiefly in operating the apparatus of the kind referred to, in such a manner that the materials therein introduced shall be subjected to a scraping action such that the impurities (garlic seed, black seed) alone shall be crushed or deformed, by reason of which the said impurities may be eliminated by the usual processes.

It consists, apart from the aforesaid principal arrangement, in certain other means which are preferably utilized at the same time and which will be hereinafter explicitly explained.

It aims more particularly to a particular manner of application (that where it is applied for eliminating from the wheat, the garlic and black seeds) and certain methods of construction (which will be indicated hereafter) of the said arrangements; and it aims moreover particularly, and that as a new industrial product, apparatus of the kind in question comprising the application of the said arrangements as well as the particular elements necessary for the establishment of similar apparatus.

And it can be, in any case, well understood from the detailed description which follows as well as from the annexed diagrammatic drawing which is, of course, given only by way of example.

Figure 1 and 2 of the accompanying drawing are respectively a side view and end view with parts left out, of a separating apparatus constructed according to this invention.

According to the invention and more especially according to the method of application and the construction of the various parts which it would seem, should have preference of description, in order to provide a separating apparatus, the following or similar steps are taken.

An endless chain a is established with the aid of rigid rectangular elements articulated together and each advantageously constituted either of sheet metal formed with projections by fluting or otherwise or better still of metallic trellis of links, or of sheet metal formed with perforations such that the grains of wheat cannot pass through said links or perforations.

This chain is mounted on two polygonal drums b and b' the sides of which are equal to the short sides of the said rectangular elements whose axes are parallel to each other and distanced so that the endless chain shall be suitably stretched, one of said drums being capable of being rotated by any appropriate means so that the upper links of the said chain are horizontal or slightly inclined from the top towards the bottom in the direction of its displacement.

In stationary supports c arranged parallel to the upper links of the chain a and at intervals thereto, spring blades e are mounted in parallel formation so that they are disposed above the said links and transversely in relation to the direction of displacement thereof, and so that the pressure exerted by said blades e on the said chain can be regulated to be sufficient for crushing the black seed and crushing or grinding the garlic seeds but is insufficient to exert any action on the seeds of wheat which are harder, when the chain carrying the grains of wheat containing the black seed and the garlic seed is displaced beneath the said scrapers.

Arranged above the front end of the upper links of the chain a (in respect of the displacement direction) a hopper d which supplies the links with the wheat to be treated.

And there is arranged below the installa-
tion which has been described a kind of hopper to receive the wheat which is ejected by reason of the displacement of the chain, at the end of the upper links which reciprocates a continuous shaking in a plane perpendicular to the direction of displacement of the chain a and which consists of a first sieve e inclined from top to bottom commencing at the point nearest to the chain and having links and size such as to allow the grains of wheat to pass but preventing the passage of the grains of garlic which have been flattened by the scrapers, which grains of garlic will fall into the space f; by a second sieve e' inclined in the opposite direction to the first one and having links of such size that it cannot let the grains of wheat pass but can let the crushed grains and dust go through; of a kind of hopper e" arranged at the lowest part of said second screen e', adapted to receive the grains of wheat from said screen, and being constituted by two inclined planes oppositely disposed in the transverse direction and connected together at the middle of the hopper at their highest point in such a manner as to distribute the wheat on both sides in sacks g disposed for this purpose; and by an inclined bottom e" adapted to collect the materials passing through the screen e' and delivering them at h.

And either the process above described is alone followed or better still the following arrangements may be incorporated.

The addition, below the drum b' of a hopper i adapted to receive the garlic seed and the wheat which may have adhered to the chain a and consequently did not fall into the shaker hopper; a scraper, not shown, which can exercise a scraping action so that the chain above the said hopper shall be freed of any grain adhering thereto which thus fall into the hopper; the grain found therein may be replaced in the hopper d or delivered onto an endless band j on which can rub a scraper j' to crush the garlic seed on the said band and cause them to adhere thereto without exerting any action on the grains of wheat, by reason of which the grains of wheat are collected at k while the garlic seed is taken off by a brush l.

The addition, to the installation, of a fan m serving to cause a current of air through a first air channel m" onto the grains falling from the endless chain so as to drive away the lightly crushed matter, said fan having, if desired, a second air channel m" capable of blowing air through the drum b' and the endless chain a to drive off dust caused from the crushing of black seed should there be any.

A casing n is provided which causes the grains of wheat to fall on the shaker, said casing having nevertheless to be taken off when air is blown through the channel m".

A collector of sheet metal, o, beneath the upper links of the chain a is provided to collect and evacuate the dust which may pass through the elements of said chain.

Brushes p acting on the lower links of the chain to clean it, are furnished the said brushes being, if necessary, provided with water from an appropriate supply, in which case the drying of the chain a is ensured by sponges provided with appropriate means for ejecting automatically any water which they suck up.

As is obvious and as is clear from what has gone before, the invention is in no way limited to these particular modes of application nor to these particular forms of construction of the various parts which have been more particularly described above, but on the contrary it covers all modifications thereof.

I claim:

In apparatus for separating impurities from grain, an endless chain conveyor formed of pivotally connected plate like links, projections carried by said links, a hopper for feeding impure grain onto said conveyor, polygonal drums carrying said conveyor, a plurality of resilient blades co-acting with the projections of the conveyor for crushing the softer grains, means for carrying said resilient blades, means for receiving the sound grains from the conveyor, means for receiving the impurities from the conveyor and a fan for directing air onto the conveyor and onto the wheat grains as they fall from the conveyor. CHARLES DROIN.