(No Model.)

J. M. CASE.

PROCESS OF MANUFACTURING CORNMEAL AND BUCKWHEAT FLOUR.

No. 344,518. Patented June 29, 1886.

FIG. I.

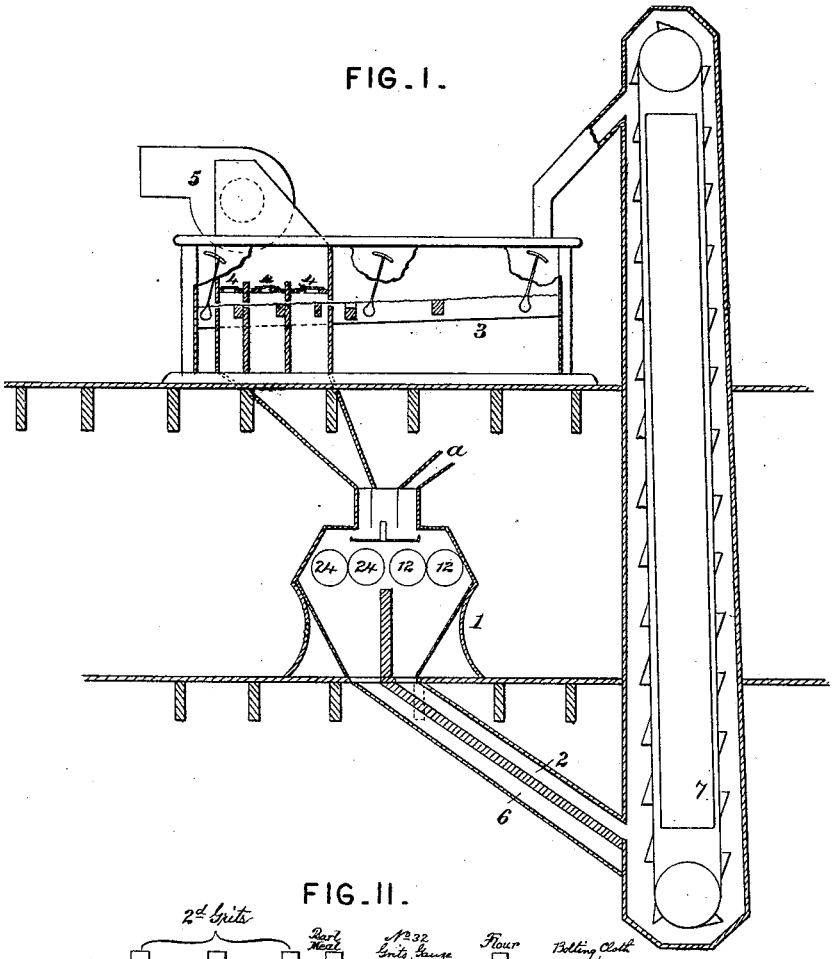
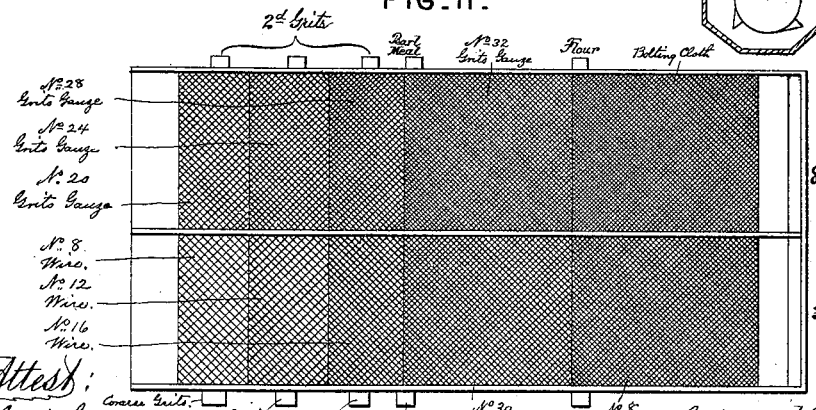


FIG. II.



Attest:
Geo. T. Smallwood.
Edward Stan

Inventor:
John M. Case
By Knight Bros Attys

UNITED STATES PATENT OFFICE.

JOHN M. CASE, OF COLUMBUS, OHIO, ASSIGNOR TO THE CASE MANUFACTURING COMPANY, OF SAME PLACE.

PROCESS OF MANUFACTURING CORNMEAL AND BUCKWHEAT-FLOUR.

SPECIFICATION forming part of Letters Patent No. 344,518, dated June 29, 1886.

Application filed January 6, 1886. Serial No. 187,811. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. CASE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Processes of Manufacturing Cornmeal and Buckwheat-Flour, of which the following is a specification.

In the ordinary method of making a high grade of cornmeal the corn is first passed through a hulling-machine for the purpose of removing the outside hull and "chit" or germ. In this operation a very considerable percentage of the starchy and glutinous parts of the berry is disintegrated and passes away with the bran for feed. The loss from the flour of this portion of the grain requires a corresponding increase in the amount necessary for the production of a certain quantity of pearl-meal. By this old system, after the hull and germ had been removed in a hulling-machine, the inner portion of the berry was broken, separated, ground, and bolted, necessitating the use of a large amount of machinery, and involving the more or less complete disintegration of the inner skin of the berry, and its hurtful intermixture with the meal and flour to a greater or less extent. While these several processes are essential in the manufacture of wheaten flour, the hard and glutinous character of the wheat-berry rendering repeated grinding necessary to its complete reduction, I find that for the softer grains—such as corn and buckwheat—a much simpler process may be adopted. Buckwheat, especially, lends itself to this simplified process by reason of the soft character of the berry and its consequent easy reduction to flour, while cornmeal does not require te be reduced to a fine grade.

My improved system is carried out preferably by the use of two machines only. The corn or buckwheat is first broken between rolls set sufficiently close to remove practically all of the outside coating of the berry and reduce the interior starchy and glutinous portions to grits and meal. By the same operation the germ is entirely liberated without being pulverized, and but a small portion of the starchy matter reduced to flour. The hulling and the first break operation are thus effected simultaneously on the first set of rolls. The material falling therefrom is conveyed to a screen whose meshes are graduated from the upper to the lower end. Here, if preferred, the flour and meal resulting from the first break may be removed. The grits, in three or more grades, are subjected to a current of air to remove the lighter impurities, and the bran tails off for use as feed. It is to be remarked that the bran resulting from a single break and separation such as this is rich and salable as feed, it not being desirable in these products to thoroughly remove the starchy portions of the berry from the bran. The aspirator is so arranged as to subject the different portions of the screen to currents of different force regulated according to the gravity of the grits passing through each section of the screen. From this separator and purifier the grits pass together to the corrugated rolls, to be reground, and the products from these rolls are separated upon a screen, preferably a section of the first screen, into flour and meal, imperfectly-ground grits, and offal. These second grits are returned to the grinding-rolls mentioned above with the grits from the first break. The stock is thus all passed through but two pairs of rolls and two screening operations.

In order that my improved process may be fully understood, I will proceed to describe it with reference to the accompanying drawings, which represent a mill for carrying out the same.

Figure I is a sectional elevation of such a mill, and Fig. II a plan view of the preferred form of screen.

To understand the apparatus, it will be necessary simply to follow the course of the stock through it. The grain enters by spout *a* one side of the roller-casing 1, and is delivered between corrugated rolls 12 12, these figures indicating the preferred number of corrugations to the inch on such rolls. On these rolls the grain is broken in such manner as to thoroughly detach the hulls from the interior starchy and glutinous part of the berry, such interior parts being also partially broken, with the result of producing a small proportion of meal and flour. The product from these rolls is delivered to a spout, 2, and elevated by a conveyer (not shown)

to a convenient point for delivery to one side of a screen, 3. Should it be desired to now separate the small proportion of flour and meal mingled with the grits, the upper end of this screen may be provided with two grades of gauze, as here shown. Below these sections this side of the screen is provided with three grades of wire-cloth of gradually-increasing coarseness, the first marked on the drawings No. 16, the second No. 12, and the third No. 8. Through the first (No. 12) fine grits are passed, through the second medium, and through the third coarse grits. Directly above these last three sections of the screen is an air-trunk leading to the eye of a fan, 5, this trunk being sectional to separate the currents of air passing through the three different sections of the screen. Valves 4 in each of these divisions of the air-trunk are adjustable by hand, so that the current of air passing through each section of the screen may be regulated in force according to the gravity of the grits falling through that section. The lighter impurities in the grits are thus carried off, the grits are divided into three grades, and the bran passes over the tail of the screen and is conveyed away for feed. The three grades of grits fall into a common spout and are conveyed to the grinding-rolls 24 24, these numbers indicating the preferred number of corrugations to the inch on such rolls. Between these rolls the grits are thoroughly ground, and the major part reduced to meal and flour, the product falling into the spout 6, whence it is delivered by the elevator 7 at a point convenient for discharge at the other side of the screen 3. This side of the screen is also divided, the first (upper) section being provided with bolting-cloth and the remaining four sections with gauze of gradually-increasing coarseness. The preferred number of the cloth and gauze employed for each section is indicated on the drawings. From the upper section flour is delivered, from the second finished pearl-meal, and from the remaining three sections three different grades of grits. The offal passes off the tail of the screen, and may be used as feed also.

The air-trunk extends completely across the screen, as do also the valves 4, so as to enable the simultaneous purification of the grits falling through or passing over all of the six lower sections of the screen, the current of air on each section being regulated according to the gravity of the material passing therethrough. The grits falling through this second side of the screen are also delivered to the spout and conducted to rolls 24 24 for regrinding.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

The process of manufacturing cornmeal and buckwheat-flour, which consists in coarsely breaking the grain between rolls so as to thoroughly detach the hulls from the interior portion of the grain, passing the material over a screen having its sections of mesh graduated in coarseness so as to separate the break flour and bran from the grits, subjecting said grits to air-currents of force corresponding to the coarseness of the screen through which they fall, passing said grits through grinding-rolls so as to reduce the major part to flour and meal, passing the resulting material over a screen having its sections of mesh graduated in coarseness so as to separate the flour and meal from the remaining grits, subjecting said grits to air-currents of force corresponding with the coarseness of the screen through which they fall so as to draw off the lighter impurities, and returning the grits to the same grinding-rolls for regrinding with the grits from the breaking-rolls, substantially as and for the purpose set forth.

JOHN M. CASE.

Witnesses:
C. N. SHOUGH,
E. D. ANDERSON.