D. SEWELL.

Removing Flour and Middlings from the Products of Crushed or Ground Wheat.

No. 227,064. Patented April 27, 1880.

Fig. 1.

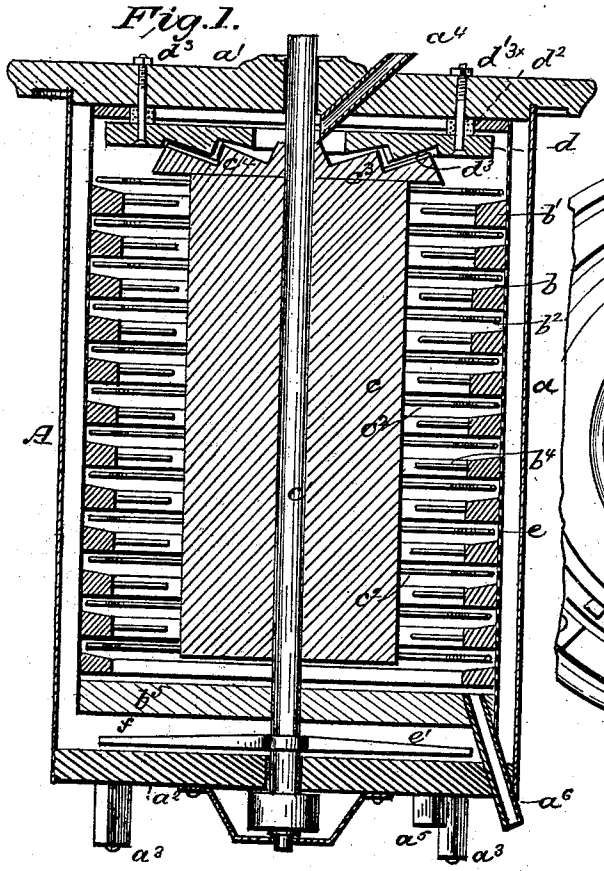


Fig. 3.

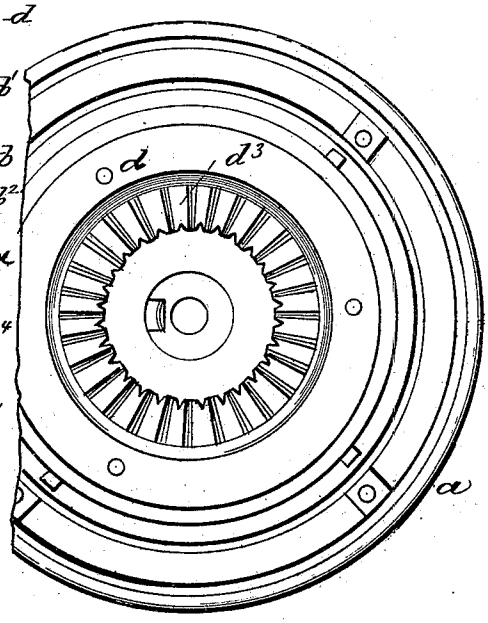
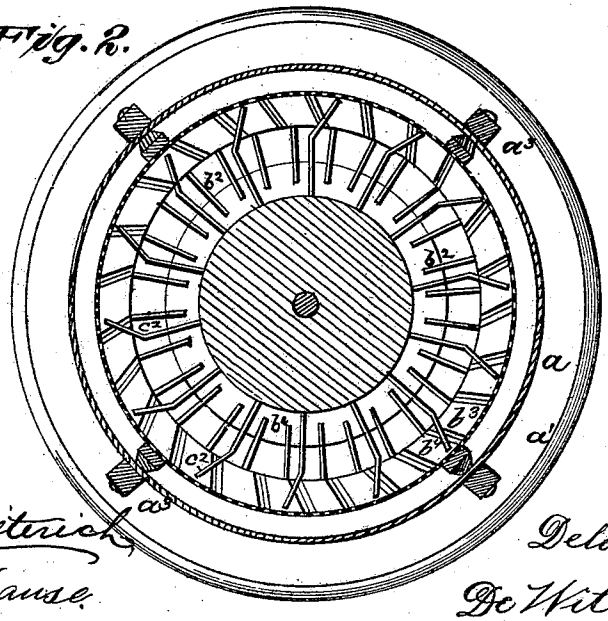


Fig. 2.



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DELOS SEWELL, OF NILES, MICHIGAN, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO ALBERT H. SEWELL, OF WALTON, NEW YORK.

REMOVING FLOUR AND MIDDLINGS FROM THE PRODUCTS OF CRUSHED OR GROUND WHEAT.

SPECIFICATION forming part of Letters Patent No. 227,064, dated April 27, 1880.

Application filed June 2, 1879.

To all whom it may concern:

Be it known that I, DELOS SEWELL, of Niles, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in the Method or Process and Means for Removing Flour and Middlings from the Products of Crushed or Ground Wheat; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being made to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a vertical section of a machine adapted for carrying out my improved method or process. Figs. 2 and 3 represent different horizontal sections through the machine.

My invention relates to certain new and useful improvements in the method or process and means for removing flour and middlings from the products of crushed or ground wheat, having for its object the production of a larger percentage of middlings from a given amount of wheat, while decreasing the amount of low-grade flour, effectually cleaning the bran at the same operation, and obviating the heating of the flour and middlings, which heating tends to discolor and deteriorate the quality thereof; and to this end the invention consists, essentially, in the method or process of removing the flour and middlings from the products of crushed or ground wheat by subjection to the combined operations of whipping or beating, scouring, and screening.

It further consists in a novel means for carrying out said method or process, all as will be hereinafter fully described.

To enable others skilled in the art with which my invention is most nearly connected to make and use the same, I will now proceed to describe the novel means employed for carrying out my improved process, referring for illustration to the accompanying drawings, in which like letters of reference indicate corresponding parts.

In the drawings, A represents an outer case or jacket, having an inlet or feed spout, a^4, passing through the head a', and two exit-spouts, a^5 a^6, passing through the lower head, a^2, of the machine, the latter spout, a^6, extending inward and connecting with the chamber of the inner casing, hereinafter described.

b represents an inner perforated jacket or wire screen, connected to the outer circumference of a series of rings, b', arranged at suitable distances apart from the top to the bottom of said perforated jacket or screen. These rings, in the full-size working-machines, are cast together in a skeleton-frame, and in sections provided with lugs, which are fitted and secured together when placed in the casing A, and said rings have their upper sides slightly beveled or inclined downwardly and inwardly, and grooved or fluted radially, as shown at b^3, Fig. 2, and they are further provided with holes in their inner edges, in which are inserted a series of inwardly-projecting stationary pins or beaters, b^2.

c represents a revolving cylinder, journaled in the heads of the casing A and inside of the perforated jacket or screen b, with a surrounding space between it and the inner edges of the rings b'. This cylinder is provided on its periphery with a series of rows of fixed teeth or beaters, c^2, arranged to alternate with the rows of inwardly-projecting teeth or beaters b^2, and projecting between the rings b', near to the jacket or screen b, and in close proximity to the upper surfaces of said rings.

The upper end of the perforated jacket or screen b is firmly secured to the head a' and concentrically with the casing A, and the lower end is secured to and closed by the head b^5, through which passes the lower axis of the cylinder and the discharge-spout a^6. This jacket or screen b is shorter and less in diameter than the casing A, and is supported in place so as to provide a chamber, e, surrounding it, and a chamber, e', between its head b^5 and the lower head, a^2, of the casing.

d represents a grinding or crushing plate, secured by bolts d' to the under side of the head a' within the jacket or screen b, and is provided with a central opening for the passage of the axis of the cylinder, and through which the material is fed between said plate d and the plate c^3. The plate d is supported only at its rim by a series of elastic cushions or supports, d^2, arranged around it and held by the bolts d', the central portion of the plate

having no support back of it, thus permitting a ready adjustment of the plate over its entire surface, or adjustment of one side only of the plate, the central opening admitting of any desired degree of vertical adjustment or movement of one or the other side of said plate, whereby it will adapt itself to larger particles of crushed or ground grain passing between it and the plate c^3. Both the plates d and c^3 are provided on their inner faces with annular corrugations, which are fluted or grooved radially, and fit together so as to produce a grinding or crushing action, the elastic cushions or supports maintaining a constant pressure until the particles of grain passing between them are reduced to a uniform size before being delivered into the beating-chamber between the cylinder and rings.

Having thus fully described the construction of a machine necessary in carrying out my improved method or process, I will now proceed to describe the operation.

The products of the wheat, after passing between rolls or burrs to be crushed or ground, enter the machine through the feed-spout a^4, passing between the plates d and c^3, and from thence discharged into the beating-chamber between the cylinder and rings, and as it is discharged into said chamber it is successively checked and operated upon by the whippers or beaters in its descent through the machine, being gradually reduced by said beaters and thrown outward through the wire screen by the centrifugal force of the revolving beaters, while at the same time the larger particles thrown outward are subjected to a rubbing or scouring action over the fluted surfaces of the rings by the revolving beaters, for the purpose of removing the adhering fine particles of flour and middlings from the bran, which pass through the wire screen or jacket, while the large particles are drawn inward by the bent portions b^4 of said beaters and discharged into the beating-chamber, to be again subjected to the action of the whippers or beaters and the rings, as above described.

It will thus be observed that the crushed or ground wheat is gradually reduced, and the adhering flour and middlings separated from the bran by the combined operations of whipping or beating and scouring, and which is thrown or forced through the screen as fast as it is reduced, and separated from the bran by the centrifugal action of the revolving beaters, and from which it is discharged out of the machine by the revolving scraper f, through spouts a^3, thus avoiding any possibility of the flour and middlings being heated, while the bran, by the time it reaches the bottom of the machine, will be effectually cleaned and discharged out of the machine through spout a^6.

By my improved method or process the successive regrindings or recrushings usually employed in the manufacture of flour (by which the flour and middlings are more or less heated, which tends to discolor and deteriorate its quality) are entirely obviated, the bran requiring no further manipulation, while the flour and middlings only require the further manipulation of being purified and subsequently reground and bolted, in the usual manner.

The plates d and c^3 are merely for the purpose of reducing the larger particles of the crushed or ground wheat to a uniform size, and said plates may be dispensed with, if desired, without materially affecting the method or process, and the fine flour and middlings separated by the usual grinding or crushing process may be removed before subjecting the balance of the products of the crushed or ground wheat to my improved method or process, which consists, essentially, in removing the flour and middlings from the products of crushed or ground wheat by subjection to the combined operations of whipping or beating, scouring, and screening.

While I prefer the novel means hereinbefore described for carrying out my improved method or process, I do not wish to be limited to it, as any means capable of producing the combined operations essential in my improved method or process may be substituted therefor.

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

1. In the manufacture of flour, the herein-described method or process of removing the flour and middlings from the products of crushed or ground wheat by subjection to the combined operations of whipping or beating, scouring, and screening, substantially as specified.

2. In a machine for removing flour and middlings from the products of crushed or ground wheat, the combination, with an interior non-perforated revolving cylinder provided with outwardly-projecting teeth or beaters, of a wire screen or perforated jacket entirely surrounding said toothed cylinder longitudinally, and a series of inwardly-projecting rings or plates, substantially as herein shown and described.

3. In a machine for removing flour and middlings from the products of crushed or ground wheat, a perforated jacket or wire screen and a series of inwardly-projecting rings or plates having inwardly-projecting teeth or beaters, in combination with an interior revolving cylinder provided with outwardly-projecting teeth or beaters, substantially as specified.

4. In a machine for removing flour and middlings from the products of crushed or ground wheat, the combination of the grinding or crushing plates d c^3, the interior revolving cylinder provided with outwardly-projecting teeth or beaters, the surrounding perforated jacket or screen, and the series of inwardly-

projecting rings or plates, substantially as specified.

5. The combination, with the revolving plate c^3 and the head a', of the plate d, provided with a central opening, the series of elastic cushions or supports d^2, arranged at or near the outer rim of the plate d, and between it and the head a', and the bolts d', the several parts constructed and relatively arranged to operate substantially in the manner herein shown and described.

In testimony that I claim the foregoing as my own I herewith affix my signature in presence of two witnesses.

DELOS SEWELL.

Witnesses:

W. K. LACEY.

FRANK E. ALWARD.