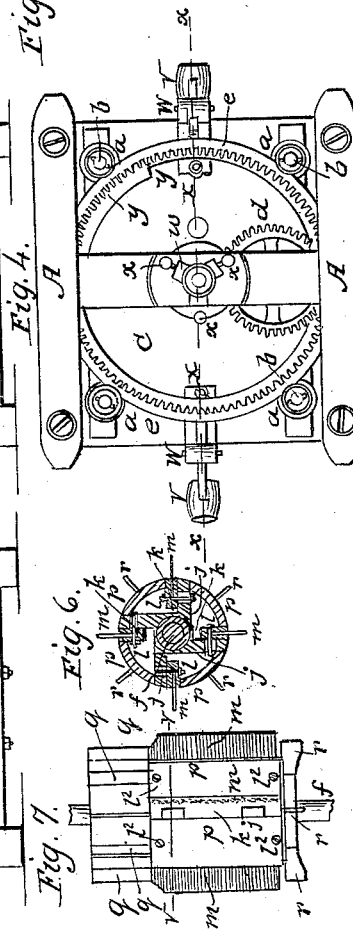
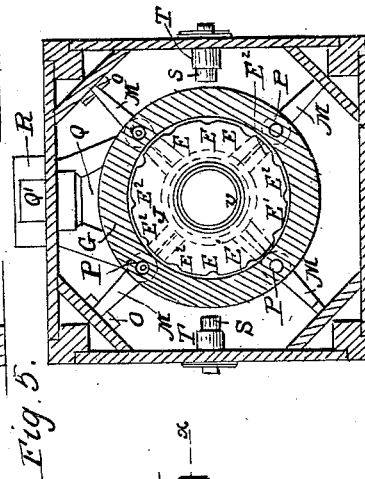


### Bran Sifter.

Patented April 17, 1849.



# UNITED STATES PATENT OFFICE.

JOSEPH JOHNSTON, OF WILMINGTON, DELAWARE.

## IMPROVEMENT IN MACHINERY FOR SEPARATING FLOUR FROM BRAN.

Specification forming part of Letters Patent No. 6,366, dated April 17, 1849.

### *To all whom it may concern:*

Be it known that I, JOSEPH JOHNSTON, of the city of Wilmington, in the county of New Castle and State of Delaware, have invented a new and useful Improvement in Upright Rotary-Cylinder Bran-Sifters, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a side elevation of the machine. Fig. 2 is a front elevation. Fig. 3 is a vertical section on the line *xx* of Fig. 4, showing the internal arrangement of the machine. Fig. 4 is a bird's-eye view showing the top of the machine. Fig. 5 is a horizontal section on the line *zz* of Fig. 3, the revolving cylinder and vibrating weights being removed. Fig. 6 is a horizontal section of the revolving cylinder on the line *vv* of Fig. 7, showing the manner of arranging the brushes so that they can be adjusted at pleasure or moved outward from the center of the closed cylinder as they wear. Fig. 7 is an elevation of the revolving cylinder, showing the removable segments which are to be removed to gain access to the interior of the revolving cylinder to set the brushes.

Similar letters in the several figures refer to corresponding parts.

A is the frame.

B are the sides, C the top, and D the bottom, making a tight case, in which the stationary reticulated or wire cylinder and revolving cylinder of brushes are arranged, and in which the flour is collected as it is separated from the bran by the brushes and wire cylinder, the bottom D of the case being inclined at such angle as to collect the flour (when discharged through and around the screen) and bring the same to a point of discharge at one side of the machine, so as not to cause any wastage of flour at the center, where the upright shaft passes through said inclined bottom.

E is a stationary cylindrical screen for sifting the bran. The upper portion E' of this cylinder is made solid and lined on the inside with triangular-shaped reflecting-bars E<sup>2</sup>, for the purpose of repeating the reflecting of the bran into the spaces between the wings of the revolving cylinder as often as the wings throw it against the said reflectors, and thereby detaching the flour from the bran be-

fore it comes to the brushes to be discharged by them through the wire-cloth.

G is a circular vibrating curb in which the wire sifter is placed, open at the top and closed at the bottom, except a circular space in the center for the admission of air, surrounded by a circular rim H, extended up into the vibrating cylinder till it nearly touches the bottom of the revolving cylinder, forming a curb for preventing the escape of the bran at the center.

I are the spaces between the circular ribs of the vibrating curb, through which the flour passes to the space between the vibrating curb and the stationary case, after having been forced through the meshes of the wire cylinder by the revolving brushes.

J is a circular cavity or depression in the bottom of the vibrating cylinder, into which the bran is collected.

K are spiral springs upon which the vibrating curb is sustained or balanced when in a quiescent state, and upon which it vibrates when struck by the pistons S.

L are boxes formed in a horizontal spider-frame M, in which the spiral springs are placed.

N are rods inserted into the bottom of the vibrating curb and projecting downward through the center of the spiral springs and their boxes and through the spider-frame for keeping the wire-cylinder in its proper position.

O are cleats on the inside of the stationary case for sustaining the spider-frame in a fixed position.

P are spiral springs let into cavities in the top rib of the screen-curb and bearing against the under side of the top of the case for preventing the curb rising upward and touching the same.

Q is the spout, leading to the interior of the wire cylinder, for conducting the bran to the outside of the stationary case.

R is another spout for conducting the flour from the external case to a receiver.

S are the pistons for vibrating the wire cylinder.

T are boxes in which the pistons move, and in which are placed spiral springs for drawing them back when relieved from the action of the vibrating hammers.

U are spiral springs coiled around the re-

duced diameters of the pistons and confined in their boxes T.

V are vibrating hammers for driving the pistons against the curb of the wire cylinder to jar and agitate the same in order to keep the meshes of the sieve free from accumulated flour.

W W are the fulcras of said hammers.

X X are anti-friction rollers, turning on wrists on the short arms of the levers, against which a spiral cam Y strikes as the large internal cogged wheel on which said cam is formed is revolved by the cogged gearing, for the purpose of raising said hammers V V alternately in the arc of a circle and again letting them drop against the pistons, when the portion of the cam *y* which is nearest the center of the wheel shall have passed the roller X at each revolution of the wheel.

*a a a a* are channeled wheels for sustaining the internal cogged cam-wheel in a horizontal position while it is revolved in that position.

*b b b b* are the studs on which the channeled wheels turn, said studs being fixed in a vertical position to the top of the case.

*c* is a pinion on the main shaft that turns an intermediate cog-wheel *d*, which is geared to the internal cogged wheel *e*, and which turns said wheel.

*f* is the main shaft for revolving the afore-said gearing and the close cylinder of brushes and wings.

*g* is the step in which said shaft turns.

*h* is a pulley on said shaft, around which is passed the band leading to the driving power.

*i i* are two metallic hubs, fastened to the main shaft *f*, having slotted radial arms *j*, to which the brush-blocks *k* are affixed by screw-bolts *l*, inserted into the slots of the arms, and by which the brushes can be set in or out at pleasure.

*m*, Fig. 6, are the brushes, inserted into the brush-blocks. These brushes, in their rotary movement, meet the bran and flour previously separated by the operation of the radial wings *q* on the upper portion of the close cylinder and the angular reflectors *E*<sup>2</sup> on the internal surface of the upper portion of the vibrating cylinder, and throw it by centrifugal force against the internal surface of the wire-sifter, through which the flour passes, while the bran descends to the circular trough J. When the brushes have become worn, the screws *l* are loosened, the blocks moved from the center the required distance, and the screws made fast.

*n o* are the heads of the close cylinder.

*p* are the removable segments of the close cylinder screwed to the heads *n o*, as represented in Fig. 7, so that one or all may be removed at pleasure in order to gain access to the interior of the cylinder, or where the screw-bolts of the brush-blocks are located.

*q* are the radial wings on the periphery of the upper part of the revolving cylinder for throwing the bran and flour against the an-

gular reflectors *E*<sup>2</sup> by centrifugal force of said revolving wings.

*r* are radial wings on the lower end of the close cylinder for creating a draft through the cylinder and also for scraping the bran in the circular trough around to the discharge-trough Q<sup>2</sup>, which leads through the external case B and curb I to the trough J at the bottom of the vibrating cylinder.

*s* is an opening in the top of the external case, at which the bran is introduced.

*t* is a central opening in the top of the case, through which the shaft passes.

*u* is a central opening in the inclined bottom D of the case B, surrounded by a circular curb *v*, extended upward into the central ring H of the vibrating cylinder and through the center of the spider-frame for preventing the escape of the flour at the center. The inclined bottom of the case should stand at an angle of about fifty or sixty degrees, or any suitable angle, for discharging the flour freely through the spout R.

*w* is the upper box of main shaft *f*.

*x* are set-screws for adjusting the shaft *f* in a perpendicular line.

The flexible cylinder E E' may have its sides inclining inward toward the center at bottom or top instead of being vertical and parallel, the edges of the wings *q* and brushes *m* being of corresponding slope.

*Operation.*—The machine being put in motion, the bran, with the flour thereon, is introduced to the cylinders through the opening *s*, the wings *q* throw it round against the inclined surfaces of the vertical angular ribs E<sup>2</sup>, which reflect it back to the wings *q*, and so on successively, causing the flour to be scoured from the bran and the whole continuing to descend is met by the radial brushes *m*, which drive the flour and bran against the wire cylinder, causing the flour to pass through the meshes of the cylinder E into the space between it and the outer case B, while the bran alone descends to the circular trough J at the bottom of the vibrating cylinder E, where it is scraped round by the wings *r* to the discharge-spout Q, the flour descending onto the inclined bottom D of the outer case by which it is conducted to the lower discharge-spout R, and while this operation is going on the indispensable operation of knocking the sides of the vibrating wire sifting-cylinder E is taking place by means of the alternately rising and falling hammers V, which are lifted in succession by the cam Y on the large cog-wheel and fall by their gravity on arriving at the end of the cam and drive the pistons alternately against the curb G, by which the wire sifting-cylinder is vibrated to the right and left, and thus the meshes of the wire-sifter are kept free from clogging matters. Should it be discovered that the machine does not work effectually on account of the brushes having become worn, the motion of the machine must be stopped and the segments *p*

removed, and the brushes adjusted in the manner before described.

I do not claim to be the original inventor of an upright bran-sifter; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The employment of the angular reflecting-bars  $E^2$ , formed on a portion of the concave surface of the vibrating sifting-cylinder  $E'$ , in combination with the radial wings  $q$  on the surface of the upper portion of the close cylinder when said cylinder is composed in part with the bristle or other brushes, said angular reflectors being thus arranged for the purpose of repeating the reflection of the bran against the radial wings  $q$  of the cylinder as often as the revolving cylinder throws it against the ribbed portion of the vibrating cylinder or concave, and thus detaching the flour from the bran before it comes in contact with the brushes to be driven through the wire cloth, as above described.

2. The employment of the gravitating hammers or beaters  $V$  for the purpose of beating or detaching the flour from the meshes of the wire-cloth, in combination with the pistons  $S$  and cam-wheel  $Y$ , springs  $K$ , and reticulated cylinder  $E$ , whether arranged in the manner described or in any other mode which is substantially the same, the vibrating or flexible cylinder being arranged on the springs  $K$ , so as to yield to the stroke of the gravitating hammers, and thereby facilitating the discharge of the flour from the meshes of the wire-cloth screen, as described.

In testimony whereof I have hereunto signed my name, before two subscribing witnesses, this 20th day of July, 1848.

JOSEPH JOHNSTON.

Witnesses:

WM. P. ELLIOT,

L. WASHINGTON, Sr.