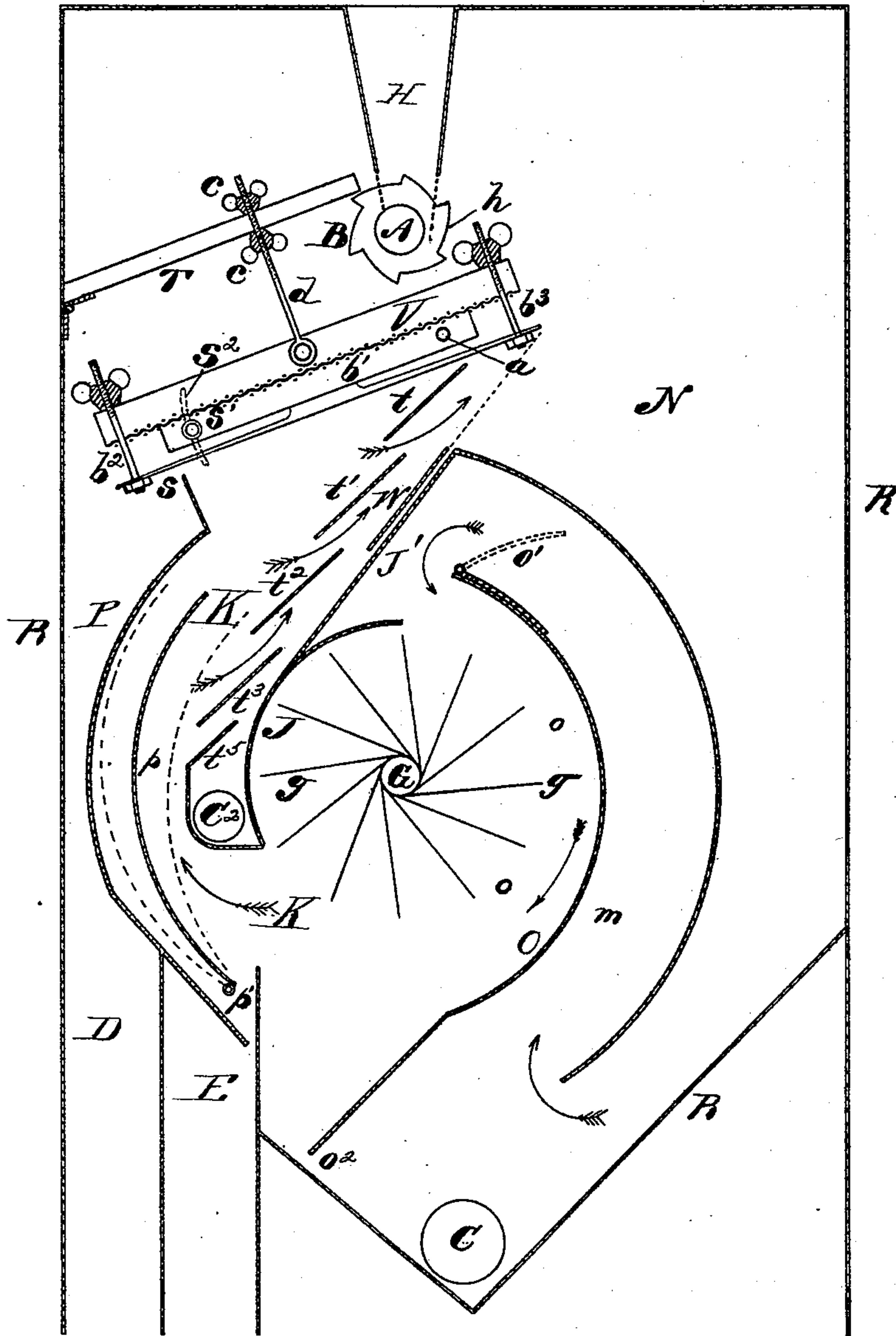


(No Model.)

D. SEWELL.  
COMBINED SCALPER AND PURIFIER.

No. 454,950.

Patented June 30, 1891.



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# UNITED STATES PATENT OFFICE.

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## COMBINED SCALPER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 454,950, dated June 30, 1891.

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*To all whom it may concern:*

Be it known that I, DELOS SEWELL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Combined Scalpers and Purifiers, of which the following is a specification.

This invention relates to a combined scalper and purifier used for separating into parts, according to the relative coarseness, crushed or ground meal coming from the crushing or grinding mill, and used either after the crushing has been completed or between the consecutive breakings of two or more sets of rolls. It is adapted to be used for the purpose of separating into parts the meal of any kind of grain where such meal is of different degrees of fineness or in which the individual particles differ in their relative specific gravity, and is intended to take the place, in part or wholly, of the sieves or bolters in common use.

The drawing represents in section a case, trunk, or box containing my invention.

R represents the outline of the case closed entirely, except at the points provided for the inlet of meal or the outlet of the separated portions after it has been treated.

H represents the hopper, in the bottom of which is a feed-roll A, controlling the feed through the opening *h*. On the same shaft with the feed-roll is a revolving cam B, operating to trot the scalper-sieve V. The sieve V is hung on the trunnion *a*, and is raised or lowered by means of the arm T, the link *d*, and the cam-wheel B. The arm T has one end hinged to the casing R and the other end rests upon the upper surface of the cam-wheel B. The link *d* extends from the sieve V to the arm T and causes the sieve to rise and fall as the wheel B revolves. The body of the sieve V is not attached to the bed *b'*, but is attached to the spring *s* by means of bolts and nuts *b<sup>2</sup>* *b<sup>3</sup>*, and the motion produced by the device is to raise the sieve above the bed and strike it sharply down against it several times during each revolution of the wheel B. The inclination of the sieve may be varied and regulated by means of the bolts', extending through the body *b'* and out through the walls of the case R through a curved slot *s<sup>2</sup>*, having its

center at *a*. The operative length of the link *d* is regulated by the setting-nuts *c c*.

The coarser parts of the meal that do not pass through the mesh of the sieve are delivered at D to be reground and re-treated, if desired. The finer parts dropping through the sieve along its entire length are received into a current of uprising air, which is employed, in connection with the various deflecting boards or surfaces hereinafter described, to separate them still further into parts, according to their fineness.

G represents a cylindrical fan, the shaft of which passes through to the outside of the case and is there provided with suitable mechanism to produce rotation. Extending out from the shaft are a number of fan-blades *g*, which set the air surrounding them and contained between them in motion when this shaft is revolved, and produce a rapid circulation of air in the direction of the arrows when the fan is revolved in that direction. Between the fan and the falling meal is interposed a shield, which extends somewhat below a line drawn horizontally through the center of the fan, and rising from that point follows closely the outer extremity of the fan-blades to a point nearly perpendicular above the center of the fan. A diaphragm *J'*, connecting with this shield on its upper and outer surface and tangent or nearly tangent to it, extends upward at an angle of about forty-five degrees to a point high enough to catch the uppermost particles of meal dropping through the sieve V. The obliquity of this diaphragm should be sufficient to prevent the gathering and clogging of particles of meal on its upper surface. From the upper point of the shield it is continued in a curved form concentric or nearly concentric with the center of the fan G to a point considerably below the fan-blades and removed sufficiently distant from the fan-blades to allow of the return-air flue *m*, a second curved diaphragm O, and the air-space *o*, between the second diaphragm O and the ends of the fan-blades. A valve *o'* at or near the top of the diaphragm O regulates the passage of the air through the flue into the space *o*. The diaphragm O is extended downward below the air-space *o* and below



the outlet K and comes near to a junction with the outer walls R of the case, leaving, however, a small outlet  $o^2$ , through which any light material that may have been carried into the air-space  $o$  may escape and drop to the bottom of the case R and be removed through the conveyer C.

In front of the fan and between the shield J and the diaphragm P is a downflue, having its upper opening wide enough to receive all the material dropping through the sieve. At intervals are placed cant-boards or deflecting-boards  $t$   $t'$   $t^2$   $t^3$   $t^5$ , arranged to receive the heavy meal dropping through the sieve to arrest it in its descent and to cause it to slide down the upper surface and over the edge of that one of the deflecting-boards which it strikes, and there be acted upon by a current of air rising upward and passing between the boards, causing the light material to pass up over the diaphragm J' into the space N, whence it slowly settles to the bottom of the case and is taken away by the conveyer C. Heavier material driven up over the upper edge of the cant-boards strikes against the rising part of the diaphragm J' and drops down into and is carried away by the conveyer C<sup>2</sup>. Still heavier material, having a specific gravity sufficient to overcome the force of the uprising air, drops down along the deflecting-boards and the wing  $p$  and finds its escape through the outlet E. The wing  $p$  is hinged at  $p'$  and operates as a valve to regulate the size of the opening or flue in front of the deflecting-boards.

The operation of the device in separating meal is readily understood from the foregoing description and the drawing, and it is seen that by the use of the scalper and the diaphragms and fan described in this specification and shown in this drawing I separate the material into four grades, of which the lightest escapes at C, the next grade at C<sup>2</sup>, the next at E, and the heaviest at D. Other grades could be made by increasing the number of diaphragms and openings. It will be seen, also, that by the use of the shields J O and compelling the air in its circulation to leave the fan and disperse itself through the large space N, I purify the air very greatly after it has been used once in the flue K and before it is drawn into the fan and used the second time, and thus prevent the light particles from being drawn around by the fans and thrown a second time in among the heavier particles of meal falling through the flue K, and the moving mass of air is broken up and allowed to deposit the particles of meal in their appropriate places. The scalper and sieve scatter the meal at its point of feed through a broad field and enable the upward-moving air to act upon the falling meal readily and completely. A valve W regulates the size of the opening between K and N. All the diaphragms and deflecting-boards are arranged to offer on their upper side a surface which will not allow the meal-dust to

accumulate on them in any great quantity. Their exact shape or curve is not necessarily that shown in the drawing, but it should always be such as to prevent the accumulation of the dust on the top.

Having thus described my invention, what I claim is—

1. The combination of a case having an inlet-opening at the top and outlet-openings at the bottom, a diaphragm dividing the space within said case into an exterior and interior chamber, with openings through said diaphragm to permit the passage of air from one part of said exterior chamber through said interior chamber to another part of said exterior chamber, and a rotary fan operating freely in said interior chamber to produce such circulation of air, substantially as and for the purpose described.

2. The combination of an outer casing, diaphragms dividing the space within said casing into an exterior and interior chamber with openings through the diaphragms between them, a rotary fan within said inner chamber, arranged to produce an upward current of air that escapes through one of said openings and passes upward and around said inner chamber, and a feed-opening arranged to feed into the upward-moving current of air, substantially as and for the purpose described.

3. The combination of an outer casing, diaphragms dividing the space within said casing into an exterior and interior chamber, with openings through the diaphragms between them, a rotary fan within said inner chamber, arranged to set in motion the air contained in said casing and produce an upward current along the outside of one side of said interior chamber, a feed-opening arranged to feed into the upward-moving current of air, and inclined deflecting-boards having their axes of inclination substantially in line with the flow of the uprising current of air and being located under said feed-opening and across the upward-moving current.

4. The combination of an outer casing, diaphragms dividing the space into an outer and inner chamber with openings between them, the said outer chamber being separated by the diaphragm inclosing the inner chamber into two parts, one of which is located under the feed-opening and receives at its lower part the uprising current of air from a fan freely rotating within the inner chamber, and the other of which is located on the opposite side of the inner chamber and receives dust-laden air over the top of the same and delivers air to said fan through an uprising flue leading from near the bottom of said second part of the outer chamber to the upper side of said inner chamber, substantially as and for the purpose described.

5. The combination of an outer casing, diaphragms dividing the space within said outer casing into an outer and inner chamber, with openings through said diaphragm to permit



a free circular movement of air through said chambers, said dividing-diaphragms so formed as to form an outer surface to said inner chamber, oblique and curved, as described, to prevent the accumulation of meal thereon, substantially as and for the purpose described.

6. The combination of a casing having feed and exit openings, an inclosed device acting to separate falling particles by the combined action of gravity, and a current of air directed

upward and acting upon said falling particles against the action of gravity, and a scalper interposed between the feed and the air-current, whereby the particles of meal are distributed across said air-current, substantially as and for the purpose described.

DELOS SEWELL.

In presence of—

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