(No Model.)

A. HUNTER.

MIDDLINGS PURIFIER.

No. 393,981. Patented Dec. 4, 1888.

Fig. 3.

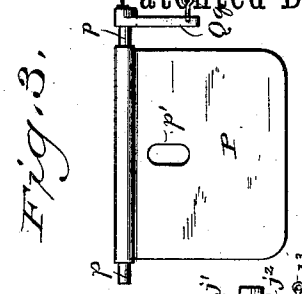


Fig. 4.

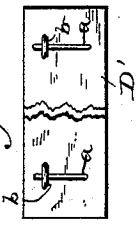


Fig. 2.

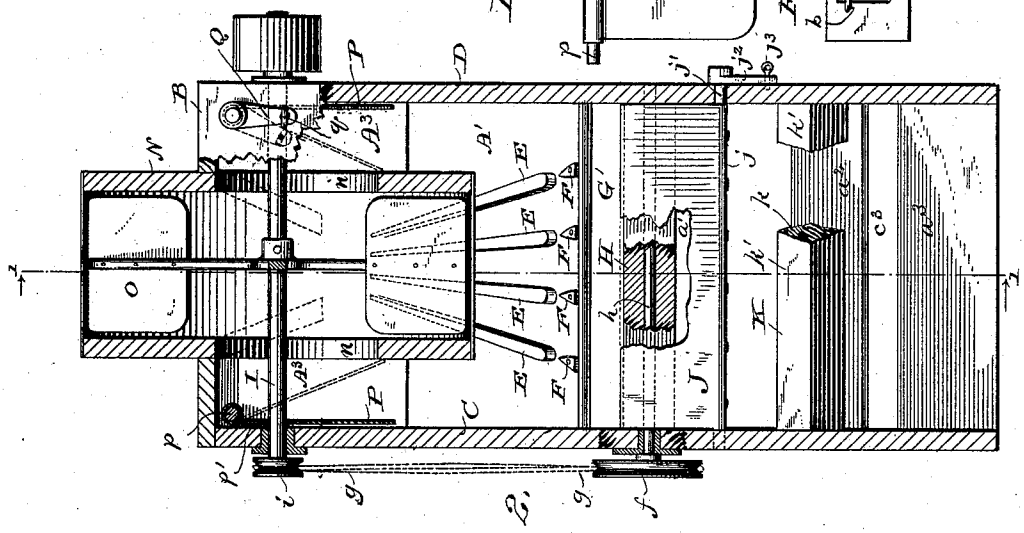
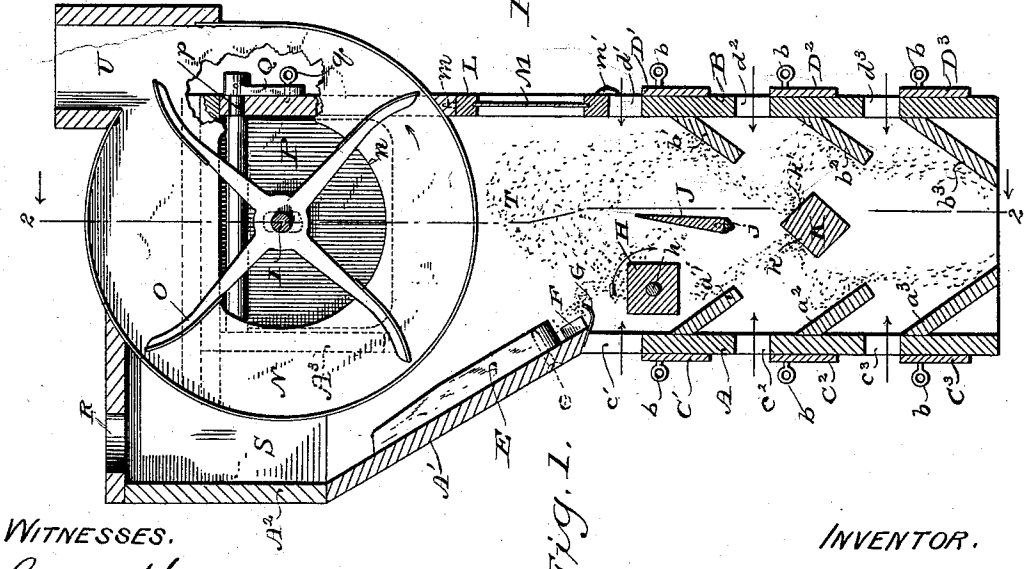


Fig. 1.



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MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 393,981, dated December 4, 1888.

Application filed November 1, 1887. Serial No. 253,947. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HUNTER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to the purification of middlings in the process of making flour, and will be fully set forth and claimed hereinafter.

In the drawings, Figure 1 is a central vertical section of my machine on the line 1 1 of Fig. 2, with parts broken away. Fig. 2 is a vertical section on the line 2 2 of Fig. 1, the two sectional views being at right angles to each other, with parts broken away. Fig. 3 is a detail view of one of the fan-valves. Fig. 4 is a detail view of one of the sliding valves.

A represents the front wall or casing of the machine, B the rear wall thereof, and C D the end walls. From the inner side of the wall A project a series of deflecting cant-boards, a' a^2 a^3, and from the opposite wall B project corresponding cant-boards, b' b^2 b^3, all of the cant-boards extending the entire width of the machine from end to end, and above the cant-boards are longitudinal horizontal openings c' c^2 c^3 in the wall A, and d' d^2 d^3 in the wall B, adapted to be lessened or closed by the sliding valves C′ C^2 C^3 and D′ D^2 D^3, respectively, which valves may be held in any desired position by means of set-screws b, passing into the walls of the machine through slots a in the ends of the said valves, as shown in the detail view, Fig. 4. Above the opening c' the middle portion of the front wall, A, flares outwardly, as shown at A′, and then is again vertical, as at A^2, and on the inner surface of the inclined portion A′ are arranged a series of dividing-fingers, E E, adjustably secured to the wall A′ by means of screws e, (shown in dotted lines in Fig. 1,) and below each finger is a pivoted dividing-block, F, which, like the fingers, may be moved to point at a different angle, if desired, and below this row of blocks F and just above the opening c' is an inwardly-extending curved trough, G.

H is a square roller located a short distance below the trough G, and likewise extending the entire width of the machine, the shaft h of said roller being journaled in the end walls, C D, and carrying at its outer end a pulley, f, adapted for connection, by means of a cross-belt, g, with a pulley, i, on the fan-shaft I above, as hereinafter explained.

J is a divider rising from its shaft j, which is journaled in the walls C D, the end j' of said shaft extending through the wall D and being there fitted with a crank-arm, j^2, by means of which the inclination or angle of the divider J may be varied, and a set-screw, j^3, passing through the end of this crank-arm into the wall D, secures the divider J at any angle to which it may be set.

K is a diamond-shaped bar extending from wall C to wall D, midway between walls A and B, and rigidly secured in place with one of its edges pointing vertically, the bar K being in line with the shaft of the divider J and midway between the cant-boards a^2 and b^2 and the inclined face k of the bar facing the end of the cant-board a', while the face k' of said bar faces the end of the cant-board b', (All shown in Fig. 1.)

L is a window-frame having a glass pane, M, secured to place in the wall B by means of a pin, m, and button m', or any equivalent means, so that said window may be opened or removed for the purpose of providing access to the fingers E when it is desired to change their inclination.

N is the fan-casing situated in the upper part of the machine, and O is the fan, the casing having openings n at each side, through the center of which the fan-shaft I passes, and in order to regulate the quantity of air passing through said openings I provide on each side of the fan-casing the fan-valves P. (Shown in detail in Fig. 3.) The shafts p of said valves are rigid therewith and journaled transversely to the fan-shaft, and one end of each valve-shaft projects through the rear wall, B, while its other end is supported in an extra wall, A^3, (shown on each side of the fan-casing,) the function of which wall A^3 is to close the space between the fan-casing and the end walls, C D, adjacent to the openings in said fan-casing. The said projecting ends of the fan-valve shafts p are provided with crank-arms Q, whereby the said valves may be moved so as

to wholly or partly close the openings n in the fan-casing, and set-screws q in the ends of the crank-arms pass into holes in the wall B and enable the fan-valves to be secured at any angle to which they may have been turned. The fan-valves are provided with suitable slots, p', to enable the fan-shaft I to pass therethrough.

The operation of my device is as follows: The middlings are introduced through the opening R into the passage S, (having hopper-shaped sides, as shown in dotted lines in Fig. 2,) between the fan-casing and the wall A^2 and fall onto the inclined surface A', when the mass is divided by the fingers E E and dividing-blocks F F and falls next into the trough G, which retards its descent, the middlings first filling the trough and then overflowing and dropping onto the revolving square roller H, which, as before stated, is connected to the fan-shaft I so as to move with the fan, and the said roller throws these middlings up into the upper part of the purifying-chamber T, while currents of air entering through the openings c' and d' aid in keeping the middlings thus thrown upward in suspension until the dust and light particles are sucked by the fan in through the openings n n and out through the passage U. As the middlings drop, they are divided by the divider J and fall on the cant-boards a' and b', and as they drop off the lower edges of these cant-boards they encounter currents of air entering through the openings c^2 and d^2, which pass up through said falling middlings, carrying up with them such light particles as may have escaped the currents above, while the middlings as they leave the described cant-boards strike against the faces k and k' of the bar K, which checks the descent of the falling middlings and deflects the same against the cant-boards a^2 and b^2, from which as they drop they encounter, in like manner as before, currents of air entering through the openings c^3 and d^3, and are thereby still further purified before dropping onto the last cant-boards a^3 and b^3, thereby practically removing all the impurities.

The machine is equally well adapted for fine as for coarse middlings by regulating the inlet to the fan by means of the described fan-valves.

My machine can be constructed as described or made double by merely placing a partition through the purifying-chamber in line with the center of the fan, thereby enabling two grades of middlings to be purified at the same time in the same machine.

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

1. In a middlings-purifier, the combination, with a suitable frame, fan, and purifying-chamber having a series of openings for the admission of air-currents thereto, of an inclined wall forming the passage-way to said purifying-chamber, series of fingers and blocks on said wall for dividing the middlings, a trough projecting inwardly from the lower edge of said inclined wall to retard the descent of the divided middlings, and a square roller connected to the shaft of the fan and located beneath the edge of the trough, whereby as the middlings overflow from the latter and drop onto the roller they are thrown by said roller to the upper part of the purifying-chamber, substantially as and for the purpose set forth.

2. In a middlings-purifier, the combination, with a suitable frame, fan, and purifying-chamber having a series of openings on each side for the admission of air-currents thereto, of a series of cant-boards projecting into the purifying-chamber below the said openings, sliding valves for regulating the admission of air at said openings, an inclined wall forming the passage-way to said purifying-chamber, series of dividing fingers and blocks on said wall, a retarding-trough projecting inwardly from the lower edge of said wall, a square roller belted to the shaft of the fan and located within the purifying-chamber below the edge of the trough for throwing the middlings received thereon to the upper part of the said purifying-chamber, an adjustable divider secured to a shaft below the said roller, and a diamond-shaped deflecting-bar located beneath the said divider, substantially as and for the purpose set forth.

3. In a middlings-purifier, the combination, with a suitable frame, fan, and fan-casing having an air-opening at each side, of adjustable fan-valves supported on shafts running transversely to the fan-shaft and extending alongside the end walls of the purifier-frame farthest from the openings in the fan-casing on each side thereof, said valves being suspended, so as to swing inward at their bases, and being provided with slots for the passage of the said fan-shaft therethrough, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ANDREW HUNTER.

Witnesses:
H. G. UNDERWOOD,
N. E. OLIPHANT.