2 Sheets—Sheet 1.

A. R. GUILDER.

MIDDLINGS-SEPARATOR.

No. 182,112. Patented Sept. 12, 1876.

Fig. 1.

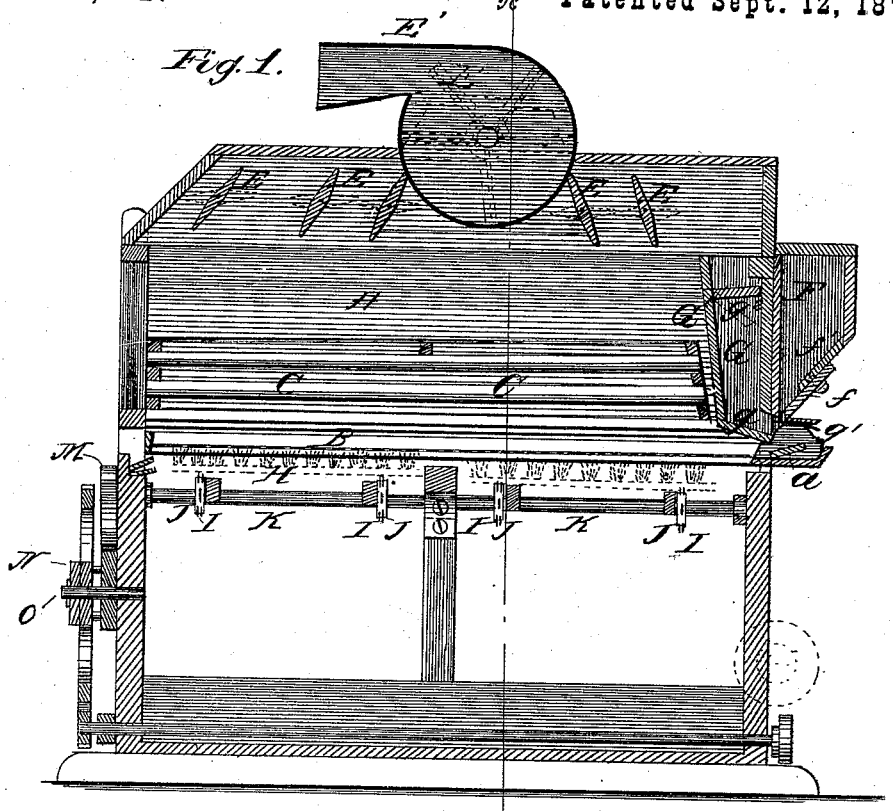
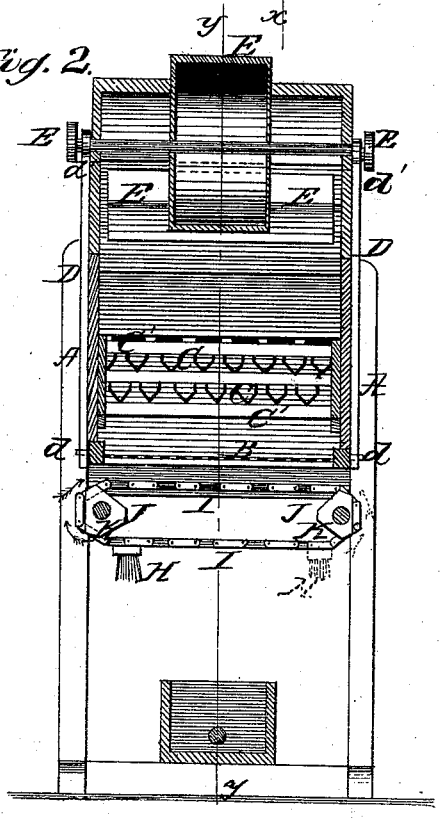


Fig. 2.



Witnesses.

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2 Sheets—Sheet 2.

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MIDDLINGS-SEPARATOR.

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Fig. 4.

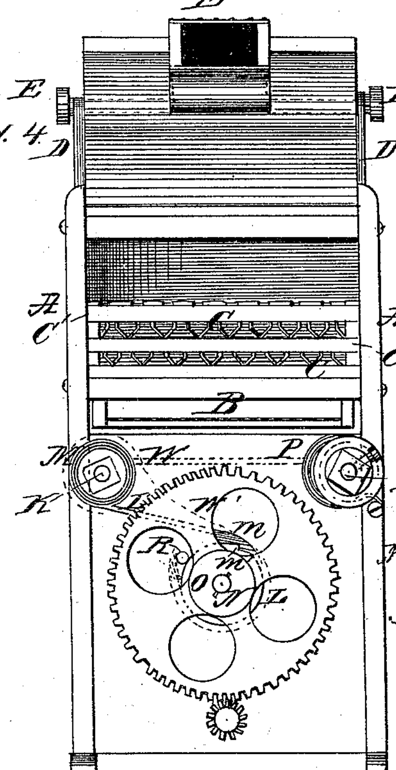


Fig. 5.

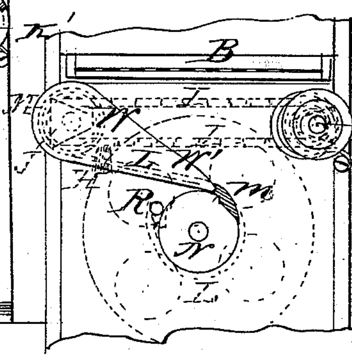
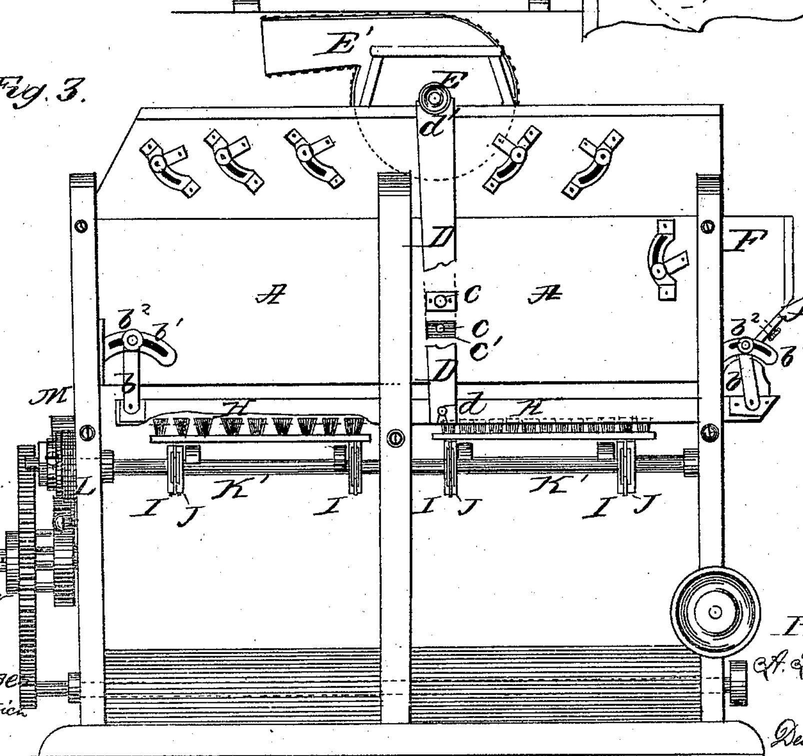


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ABSALOM R. GUILDER, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN MIDDLINGS-SEPARATORS.

Specification forming part of Letters Patent No. **182,112**, dated September 12, 1876; application filed July 3, 1876.

To all whom it may concern:

Be it known that I, ABSALOM R. GUILDER, of Minneapolis, in the county of Hennepin and State of Minnesota, 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, reference being made to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal vertical section; Fig. 2, a transverse vertical section; Fig. 3, a side view; Fig. 4, an end view. Fig. 5 is a detail view of the mechanism for operating the brush or brushes.

Like letters of reference in the specification and drawings refer to like parts.

This invention relates to machines for purifying middlings and flour, in which a reciprocating screen and a fan for producing ascending air-currents through the screen are used.

The nature of my invention consists in mechanism for giving a simultaneous and corresponding vibrating motion in each direction to the screen and frame carrying a series of troughs. It also consists of a brush or brushes receiving a slow reciprocating transverse motion in one direction, and a quick return motion in the opposite direction, all as hereinafter fully described.

In the annexed drawings, A designates the casing of the machine. B designates the screen, covered with cloth of different degrees of fineness in the usual manner. This screen is supported from its four lower corners by means of links *b*, which are pivoted to brackets b^1 of a segmental form by means of pivot-clamps b^2, adjustable in curved slots in said brackets. This adjustment allows the screen to be raised or lowered, as desired, and at the same time to be moved in a longitudinal direction. The screen receives a rapid vibrating or reciprocating movement by means of two levers, D D. The lower long-slotted ends of the levers receive wrist-pins *d d*, which are fixed into the screen-frame at or near the middle of its length, and the upper long-slotted ends embrace eccentrics *d' d'*, which are keyed on the shaft *e* of a fan, E, which receives rotation from a driving-shaft, by means of a belt and pulleys, in the usual manner. These levers D D are fulcrumed to the frame of the machine at or near their centers, as clearly shown in Fig. 3. Above the screen is the fan E, working in a box, E', on top of the machine. Beneath the fan-box, and in the upper portion of the case, are arranged a series of transverse valves, *e'*, for regulating the air-currents through different sections of the screen. F designates the hopper, the lower end of which is provided with an adjustable strip, *f*, and also an inclined deflecting-board, *f'*. The strip *f* is designed for regulating the feed, and the board *f'* for preventing a direct influx of air when the upper portion of the hopper is open, and also to evenly distribute the material upon the board *a*, which distributes it evenly upon the head of the screen. G is a chamber formed by the inclined transverse partition G' and the front casing of the machine. The partition G' is provided on its lower end with an outwardly-inclined transverse board, *g*, which overlaps the board *a*, and leaves an opening, g^1, which communicates with the interior of the chamber G, within which an adjustable valve, g^2, is arranged for regulating the air-currents passing through said chamber to the fan.

By the above-described arrangement of devices the material, while passing from the hopper to head of screen, is subjected to the air-currents, which remove a great portion of the light impurities before reaching the screen. Above the screen, and about half-way between the same and the suction-fan, I arrange a series of inclined longitudinal troughs, C, within a frame, C', receiving a vibrating or reciprocating movement corresponding with the movement of the screen through the medium of the levers D D, which receive wrist-pins *c c* secured to the frame C', said wrist-pins working in the slots *c' c'* in the side casings of the machine, as shown in Fig. 3.

The troughs C are arranged preferably in tiers, so that those of one tier alternate with the spaces of the next, and above the spaces formed by the upper tier of troughs are arranged a series of longitudinal slats to allow the air-currents to pass up between the troughs, and yet receive or catch the coarse light matters, &c., which are taken up from the screen by the air-currents, and fall before

arriving at the fan. The material deposited in the troughs is, by the vibrating or reciprocating movement imparted thereto, carried and discharged out of the end of the machine, with the bran and offal carried over the tail of the screen. Beneath the screen are one or more brushes, H, which are arranged to sweep across the under surface of screen from side to side, so that they move at right angles to the flow of the material over the screen, thus avoiding mixing of the different grades of the material, and keeping the screen clear. The brush or brushes H are secured to endless chains I I, applied around sprocket-wheels J J on horizontal shafts K K′. The brush or brushes H receive a slow reciprocating movement in one direction through the medium of a band, L, having one end secured to a pulley, M, on end of shaft K, outside of the casing of the machine. This band is wound around the pulley M, and its free end provided with a pawl, *m*, which engages with a notch, *m′*, on pulley N mounted on the short horizontal shaft O. As the pulley N is revolved the pawl, with the band, is carried around with said pulley, which communicates the slow reciprocating movement to the brush or brushes through the medium of the chains L L, shafts K K′, and pulley M. A coiled spring, P, secured to the shaft K′ and outer casing of the machine, and which is wound around the shaft as it is revolved in one direction by the devices hereinbefore described, gives the quick return movement to the brush or brushes, when the pawl *m* is released from contact with the notched pulley N, which is accomplished by means of a pin, R, secured on the outside casing of the machine, and in such relation to the notched pulley as to allow said pulley nearly a complete revolution before disengaging the pawl, as clearly shown in Fig. 4. It is very important to have the band L of such a length, and the pulleys M N of such size, as to allow the brush to go far enough in each direction so as to hang perpendicularly downward, whereby the material lodged therein can drop out of it, thereby cleaning the brush, as clearly shown by the arrows in Fig. 2. The coiled spring can be adjusted to any required amount of power for giving the quick return movement to the brush or brushes.

I do not wish to confine myself to a spring for producing the quick return movement to the brush or brushes, as the same result can be produced by means of a pulley secured to the shaft K′, and provided with a weight and cord. The slow reciprocating transverse motion to the brush in one direction, and the quick spring or weight motion in the other direction, produce more the effect of a brush operated by hand.

The reciprocating troughs, before referred to, also equalize the air-currents through the screen.

Further description of the operation is deemed unnecessary, as it seems obvious from the foregoing description, except that the moving parts of the machine are operated through the medium of gear-wheels and belts and pulleys in the usual manner.

The pulley M, and band when wound up on said pulley, are inclosed in a case, W, having a tapering end, W′, which prevents the pawl from being drawn within said case when wound up by the quick return movement of the brush.

I am aware that a reciprocating frame, provided with a series of troughs, and arranged between the screen and fan of a middlings-purifier, is old, and such I do not claim as my invention; but

What I do claim is—

1. The combination, with the screen and frame carrying the troughs, of the slotted levers D D, wrist-pins *d d* and *c c* arranged on the same side of the fulcrum of said levers, and eccentrics *d′ d′* for giving a simultaneous and corresponding vibrating motion in each direction to the screen and troughs, substantially as specified.

2. The combination, with the brush or brushes H, of suitable mechanism adapted to impart to the brush or brushes a slow transverse reciprocating movement in one direction, and a quick return movement in the other direction, across the under surface of screen, and at right angles to the flow of the material over the same, substantially as and for the purpose specified.

3. The combination, with the brush or brushes, endless chains I I, sprocket-wheels J J, and shafts K K′, of the pulley M, band L, having pawl *n*, notched pulley N, horizontal shaft O, and coiled spring P, or its equivalent, all arranged to operate in the manner substantially as and for the purpose specified.

ABSALOM R. GUILDER.

Witnesses:

H. O. HAMLIN,

BENJ. MASON.