C. BALLINGER.

Machines for Cutting Down from Feathers.

No. 199,175. Patented Jan. 15, 1878.

Fig: 1.

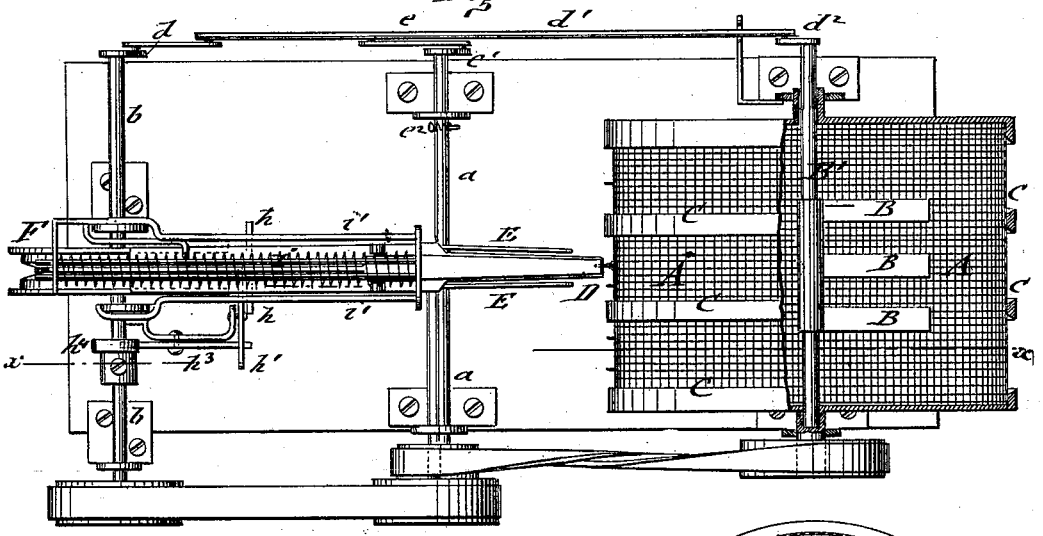


Fig: 2.

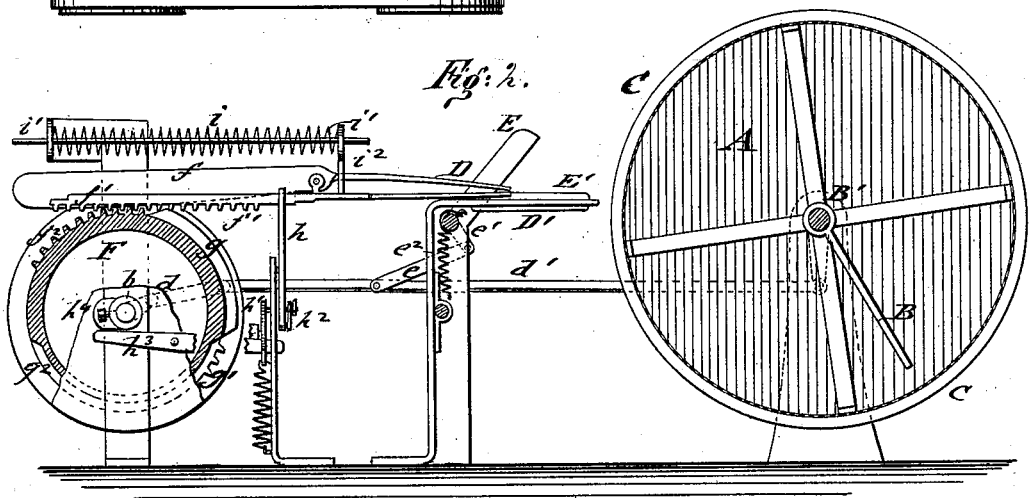


Fig: 4.

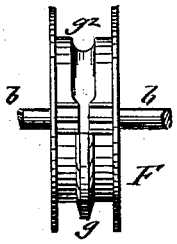


Fig: 3.

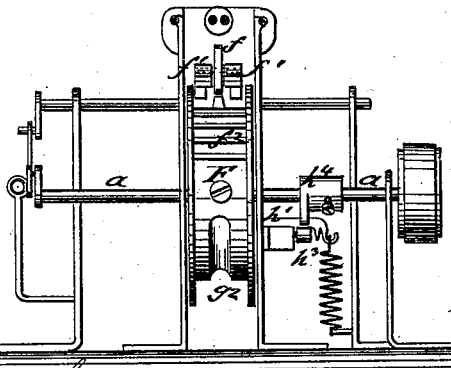
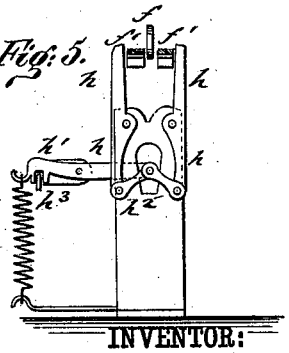


Fig: 5.



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CHARLES BALLINGER, OF WHITE MILLS, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR CUTTING DOWN FROM FEATHERS.

Specification forming part of Letters Patent No. **199,175**, dated January 15, 1878; application filed May 12, 1877.

To all whom it may concern:

Be it known that I, CHARLES BALLINGER, of White Mills, in the county of Wayne and State of Pennsylvania, have invented a new and Improved Machine for Cutting Down from Feathers, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a plan view of my improved machine for cutting down from feathers; Fig. 2, a vertical longitudinal section of the same on line *x x*, Fig. 1; Fig. 3, an end view of the same, showing the griper-actuating-cam mechanism; and Figs. 4 and 5 are detail views of the griper-actuating cam and of the clamp-levers for retaining the gripers.

Similar letters of reference indicate corresponding parts.

The invention is intended for the purpose of providing a rapidly-working and effective machine for cutting or trimming the vanes of feathers from their stems, so as to utilize them as down for the filling of pillows, covers, &c.; and the invention consists, essentially, of a revolving feed-drum of wire-gauze, with interior reciprocating stirrer and exterior guide-bands, through which the feathers are fed by sticking out, and taken hold of by a series of intermittently-reciprocating gripers, which expose the feathers to the cutting action of reciprocating or revolving knives for trimming off the down.

By reference to the drawing, A represents a revolving cylinder or drum of suitable size, which is covered at the circumference with wire-gauze or other suitable material, and is generally provided at the side with a door and opening for inserting the feathers to be trimmed for down. The feathers are agitated in the drum by radial stirrer-arms B, which are secured to a central shaft, B′, on which the drum revolves, by sleeve-shaped bearings of its heads, which turn again in bearings of supporting-standards.

Reciprocating motion is imparted to the stirrers B, for the purpose of causing the feathers to pass, with the heavier ends of the stems downward, through the meshes of the wire-gauze, and stick out of the same at various points of the circumference of the drum.

The drum A is divided by parallel circumferential bands C, with inwardly-beveled sides, into a number of narrow sections, each section supplying the required quantity of feathers to reciprocating gripers D, of which as many pairs are arranged in front of the drum as there are sections of the same. The beveled sides of the bands C assist the feathers in their outward passage by glancing them off at the same inclination, so as to be taken hold of by the fingers of the gripers and drawn out of the drum by the receding motion of the same. The feathers, being held at the stem by the narrow fingers of the gripers D, are drawn back and exposed to the action of reciprocating or revolving cutting-knives E, which shear or trim off, in connection with fixed cutting-knives E′, the down from both sides of the stem, dropping the same on a vibrating and transversely-moving belt for conveying it off.

The machine may be operated by power or hand, receiving motion from a driving-shaft, *a*, which imparts, by belt-and-pulley connection, rotary motion to the drum, and, by a second belt and pulleys, motion to a second shaft, *b*, that operates, by suitable connecting mechanism, the stirrers, gripers, and knives.

The motion of the stirrers B is accomplished by a crank, *d*, of the shaft *b*, and crank-rod d^1, connected with a crank, d^2, of stirrer-shaft B′, while the reciprocating motion of the cutting-knives is produced by a pivot-link, *e*, connected to a crank-arm, e^1, of the cutter-shaft, assisted by a spiral spring, e^2, attached to cutter-shaft. A compound motion is imparted to the gripers D, which are guided along a horizontal arm, D′, carrying the fixed side knives E′. The upper finger of the griper D is fulcrumed and extended back of the fulcrum, passing by a weighted vertical arm, *f*, through the center slot of the similarly-extended rear arm f^1 of the lower griper-finger, the rear arm f^1 being toothed at the under side to be engaged by the teeth f^2 of a cam-wheel, F, of shaft *b*, said teeth extending over a certain part of the circumference only. A raised central cam, *g*, forms the continuation of the toothed part, and acts on the rear arm of the upper finger, so as to raise the rear arm and lower the finger for clamping tightly on the lower finger, and hold the stem of one of the feathers clasped for exposing the feather to the cutting-knives,

the fingers being carried by the intermeshing of the toothed part of the cam-wheel F with the rack-arm of the lower finger back into line with the cutting-knives. After the cutting operation is completed, the fingers are carried back still farther by means of a few cog-teeth, g^1, which are arranged on the circumference of the cam-wheel at the end of the cam g, a central groove or indentation, g^2, forming the continuation of the cam g, so as to admit the dropping of the rear arm of the upper finger, and thereby the opening of the gripers. The gripers are closed again when the first series of teeth engage the rack-arm of the lower finger and withdraw the gripers. The gripers are retained, when they arrive in line with the cutting-knives, by clamping-levers h, which are pressed on both sides of the rack-bar by a fulcrumed and spring-acted lever, h^1, and pivot-links h^2, operated by a second lever, h^3, and cam h^4 of shaft b, as shown in Figs. 2, 3, and 5, so as to bind on the gripers for a sufficient length of time to admit the trimming off of the down, but release them and admit, first, their backward motion by the teeth g^1, and then the quick forward throwing of the gripers by a spiral spring, i, guide-rods i^1, and an upward-extended plate, i^2, of the lower finger. The gripers clasp then the next feather sticking out from the drum, carry it back for trimming, and are thrown forward again, and so on, the cam-wheel revolving continuously and producing the intermittent motion of the gripers and the opening and closing of the same, for taking hold of the feathers and dropping the stems, in connection with the binding-levers and top spring and guides. The tedious cutting off of the soft vanes or down from the stems of feathers by hand is thus dispensed with and accomplished in a more rapid, economical, and effective manner, and thereby a large quantity of feathers, which are at present lost, utilized for application in the trades.

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

1. A machine for cutting or trimming off the down from feathers, consisting essentially of a revolving feed cylinder or drum for the feathers, intermittently-reciprocating gripers, and intermittently-acting shearing or cutting knives, substantially in the manner and for the purpose set forth.

2. In a down-cutting machine, the combination of a revolving wire-gauze feed-cylinder with interior reciprocating stirrers, for causing the stems of the feathers to stick out through the meshes, substantially as described.

3. In a down-cutting machine, a revolving feed drum or cylinder divided by circumferential bands into narrow sections, each supplying a set of gripers and knives, substantially as specified.

4. The combination of the intermittently-reciprocating and opening and closing gripers D with a guide-support, D′, having fixed side knives E′, and with reciprocating or revolving cutting-knives E, substantially as described.

5. The combination of the forked and rack-shaped rear arm of the lower griper-finger, and of the weighted and pivoted rear arm of the upper finger, with a revolving cam-wheel having sectional toothed parts, raised central cam part, and centrally-grooved part, for withdrawing, opening, and closing the gripers, substantially as described.

6. The combination of the extended rear arms of the gripers, the actuating cam-wheel, constructed as set forth, the retaining side levers, and the returning spring and guides, to withdraw and retain gripers for cutting off the down from the feather and return the gripers, substantially as and for the purpose described.

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