(No Model.)

F. H. BEERS.

MACHINE FOR SPLITTING FEATHERS.

No. 490,468. Patented Jan. 24, 1893.

Fig. 1.

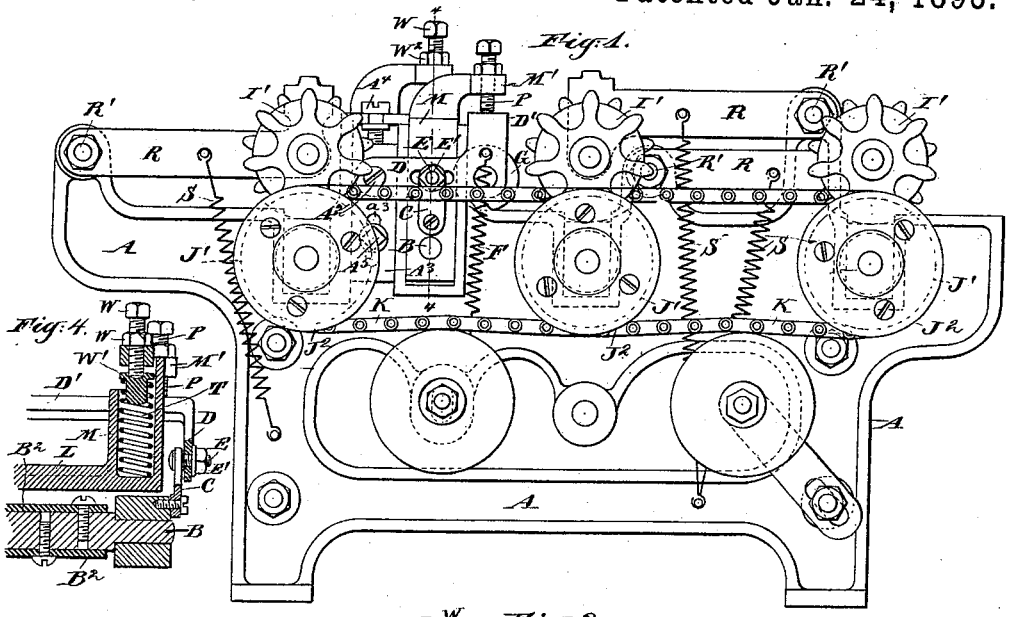


Fig. 4.

Fig. 2.

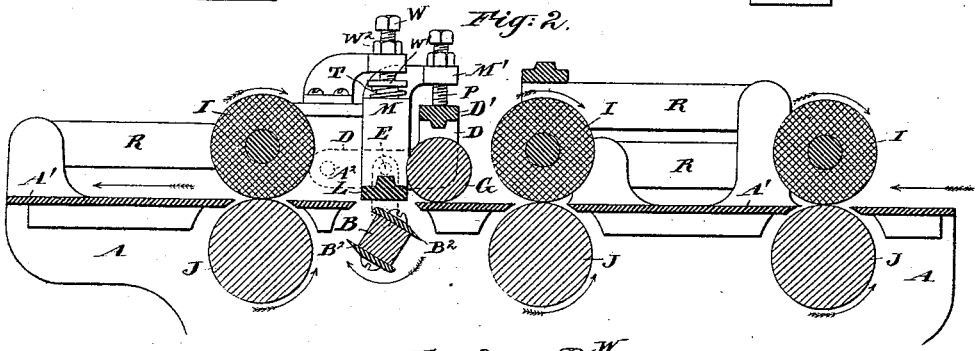
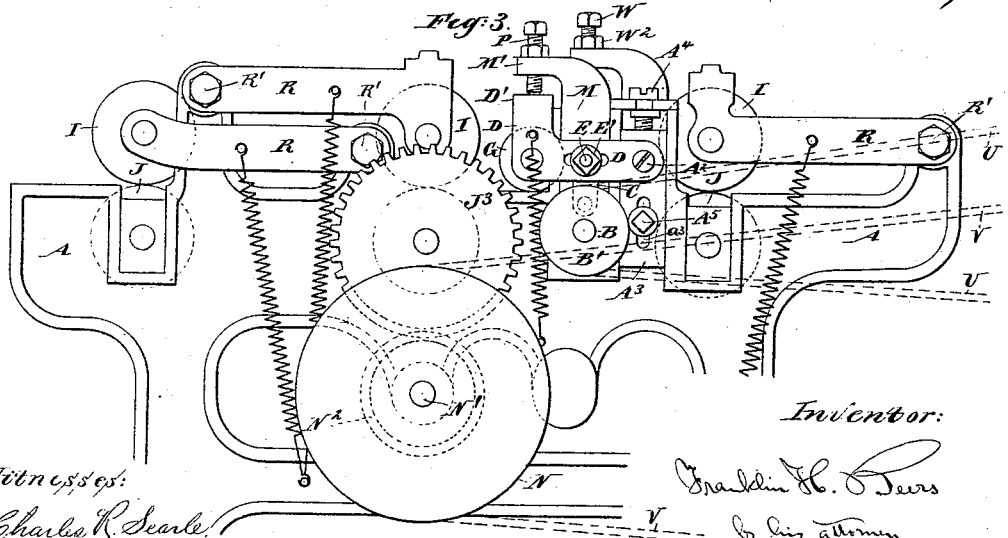


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

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MACHINE FOR SPLITTING FEATHERS.

SPECIFICATION forming part of Letters Patent No. 490,468, dated January 24, 1893.

Application filed March 26, 1892. Serial No. 426,498. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN H. BEERS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Machines for Splitting Feathers, of which the following is a specification.

What is termed in the art "splitting" is dressing off a portion of the under or inner side of the shank or central stem, leaving the outer side of such stem, in which resides the main portion of the strength, intact. The removal of the under portion contributes greatly to the flexibility without materially detracting from the strength of the feather. It has long been common to thus remove a portion of the material in preparing feathers for various ornamental uses,—for dusters, and generally where great flexibility is desired. The treatment required is peculiar. The feather naturally tapers. The removal of the material is graduated, removing less and less as the cutting proceeds from the butt or large end to the small end or tip of the feather. My machine will thus split feathers accurately and rapidly without requiring skilled labor.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation. Fig. 2 is a vertical longitudinal section. Fig. 3 is an elevation of the side opposite to Fig. 1. Fig. 4 is a vertical transverse section of a portion on the line 4—4, in Fig. 1.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is a frame of cast iron or other suitable material, having a plane horizontal bed A′, along the smooth upper face of which the feathers are successively carried in being treated.

B is a horizontal shaft, revolved rapidly by a belt running on a pulley B′ and carrying knives B^2, which, working in an aperture in the bed, effect the dressing or splitting of the feather. Its bearings are carried in links C, C, which are suspended on pivots E set adjustably in levers D which turn on pivots A^2, and are urged downward by springs F.

M is a vertically movable slide mounted in each side of the framing, and having a horizontal arm M′ carrying a screw P, by means of which it is raised and lowered, as will presently appear. These slides M carry at their lower ends a horizontal table L extending across over the cutter-shaft B, and adapted to gage the action of the cutter by holding the feather down more or less closely to its revolving knives B^2 as the slides M, M′, shall be raised and lowered.

G is a nicely finished iron roller turning freely on bearings in the levers D, D, and adapted to ride on the feathers as they are successively traversed along on the bed A′ by the several pairs of feed-rollers I, J. The lowermost feed-roller J of each pair is of metal alone; the uppermost, I, is covered with soft vulcanized rubber, which can yield and adapt itself to the slightly rounded contour of the upper and hard side of the feather. The feathers are fed through in succession, each with its large end foremost, and its back or outer side uppermost. Each portion of the feather in passing under the roller G holds up the latter to a greater or less extent, proportionate to its thickness. It follows that the table L is raised and lowered with each corresponding movement of the roller G, and to the same extent. A cross-bar D′ connects the levers D over the roller G. This bar D′ is raised and lowered to the full extent of each rising and sinking motion of the roller G. It communicates this motion through the adjusting screw P to the arm M′ on the vertically moving slide M which carries the table L. This slide is urged downward by its gravity, and also by spiral springs T which abut against collars W′, adjustable up and down, as required, by the nuts W^2, on the screws W. Each feather in moving through the machine lifts the roller G to the full thickness of its butt end, and raises the table L to the same extent, while raising the cutter-shaft B to only about half the extent. It follows that when the machine is working, the cutters will dress off from the under side of the quill or stem of the feather about half the thickness. As the feather moves forward, and success-

ively brings thinner and thinner portions of its stem under the roller G, this roller sinks and lowers the table L to an equal extent, and lowers the cutter-shaft B to a less extent. Under these conditions, the cutters will remove less, but still maintaining the same proportion of the thickness as at first. As the feather moves forward and presents finally the thinnest portion of its stem under the roller G, the table L is correspondingly lowered, and the cutter still being lowered only about half as much continues to remove the same proportion, about half the thickness of the stem of the feather. The screw P may be raised and lowered in the arm M′, and this will correspondingly influence the action. If this screw is raised, it will allow the table L to stand lower, and more of the feather will be removed. If this screw is depressed, it will raise the table L, and less of the feather will be removed.

The machine is capable of adjustment to vary the proportion which is removed. This is effected by changing the point of attachment of the links C to the levers D. Each pin E is set in a horizontal slot in the lever D, and by slackening a nut E′ the corresponding pin E may be set nearer to, or farther from the axis of motion, thus correspondingly changing the proportion of the motion. That is to say, if the pivots E are set to the right in Fig. 1, the cutting-shaft will be raised and lowered a little more than half; and if it is set to the left in Fig. 1, it will be raised and lowered a little less than half the motion of the roller G. It will correspondingly remove in the first case more than half the thickness of the stem of the feather, and in the latter adjustment it will remove less than half. The pins A^2 on which the levers D are centered may be similarly adjusted up and down. They are set each in a vertically adjustable block A^3 capable of being raised and lowered to any required extent by means of the screw A^4, and held securely in place when thus adjusted by a screw A^5 which extends through a slot a^3, and engages in the framing. By slackening this screw A^5, the pivot A^2 may be shifted down or up, as required, and it will be again firmly held by tightening the screw.

The belt U, shown in dotted lines in Fig. 3, which drives the cutting-shaft B, may be driven from any suitable pulley, not shown. The same pulley may drive another belt V, also shown in dotted lines, which runs on a pulley N, carried on a shaft N′, supported in fixed bearings, and provided with a small pinion N^2 which gears with a larger pinion J^3 on one of the lower feed-rolls J. Each pair of feed-rolls, I and J, are engaged together by step-gears I′, J′. The pair of feed-rolls which thus receives the motion through the belt V imparts corresponding motion to the other pair of feed-rolls by means of the sprocket-wheels J^2 and pitch-chains K, K. The bearings of the lower feed-rolls J may rest immovably in bearings in the framing. It is important that the upper feed-rolls I be allowed to yield to accommodate the varying thickness of the feathers at different points, not only by the yielding of the elastic surfaces of those rollers, but also by the shifting of the centers up and down within moderate limits. The gear-wheels I′, J′, are made with long teeth adapted to allow such motion, and the boxes in which the bearings of the rolls I are received are formed with levers R turning on pivots R′ set in the framing, as shown. The arc described by these levers as the upper feed-rolls I rise and sink coincides so nearly with a straight vertical line that no disturbance in the action results.

Contractile spiral springs S connect from fixed points on the framing to the levers R and insure an efficient but yielding pressure of the upper feed-roll I upon the lower roll J, and consequently upon the separate feathers as they are passed between them.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

I claim as my invention:—

1. In a feather-splitting machine, the combination with means for singly feeding forward the feathers of means for splitting or dressing off a portion of the thickness of the stem or rib, and means for automatically gaging the quantity thus removed proportionally to the varying thickness of the stem, as herein specified.

2. In a feather-splitting machine, the combination with means for singly feeding the feathers of means for dressing off a portion of the thickness of the stem, the table L rising and sinking as the thickness of the stem varies, and to the full extent of such variation, and the roller G levers D adjustable pivots A^2 and links C operated by the levers for raising and lowering the cutting means to a less extent, as herein specified.

3. In a feather-splitting machine, the combination with means for singly feeding forward the feathers of means for splitting or dressing off a portion of the thickness of the stem, the fixed bed A′, roller G, movable table L rising and sinking to the full extent of the motion of said roller, and the levers D, each having one end operated by the roller and the other end adjustable on the fixed framing, the adjustable pivots E carried in said levers, the links C and shaft B, all arranged for joint operation substantially as herein specified.

4. In a feather-splitting machine, the combination with the lower feed-rolls J of soft-surfaced upper feed-rolls I and yielding levers R carrying the latter, and driving means adapted to rotate each member of the several pairs, and with the fixed bed A′, roller G, movable table L rising and sinking to the full extent of the motion of said roller, and the

levers D, each having one end operated by the roller and the other end adjustable on the fixed framing, and the adjustable pivots E carried in said levers, and connecting by the links C with the shaft B, all arranged for joint operation substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

FRANKLIN H. BEERS.

Witnesses:
H. A. JOHNSTONE,
J. L. FINGLETON.