(No Model.) 3 Sheets—Sheet 1.

J. MOFFAT & W. W. VIRTUE.

ANIMAL SHEARS.

No. 494,071. Patented Mar. 21, 1893.

Fig. 1.

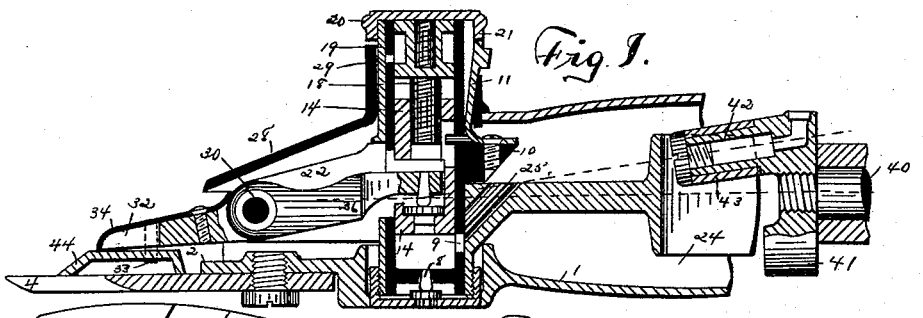


Fig. 2.

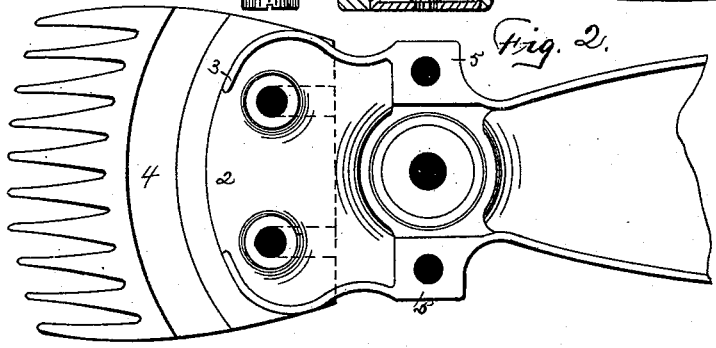


Fig. 3.

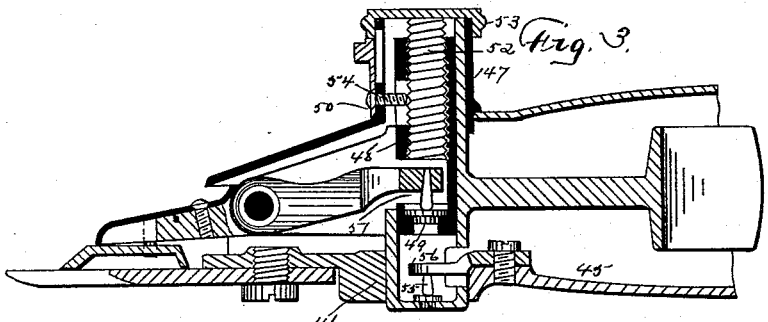
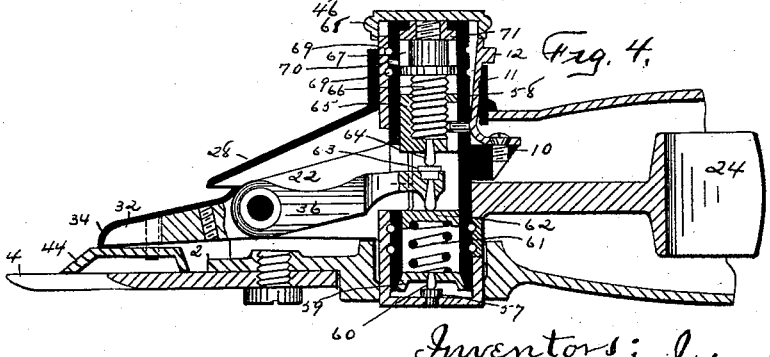


Fig. 4.



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W. J. Davis

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(No Model.) 3 Sheets—Sheet 2.

J. MOFFAT & W. W. VIRTUE.

ANIMAL SHEARS.

No. 494,071. Patented Mar. 21, 1893.

Fig. 5.

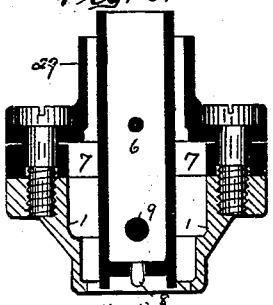


Fig. 6.

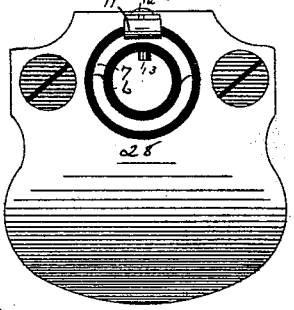


Fig. 9.

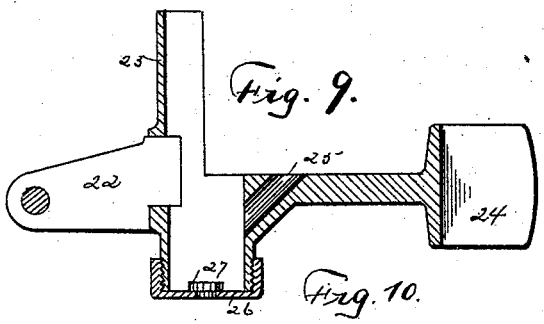


Fig. 10.

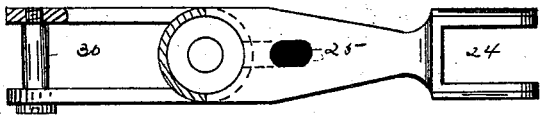


Fig. 11.

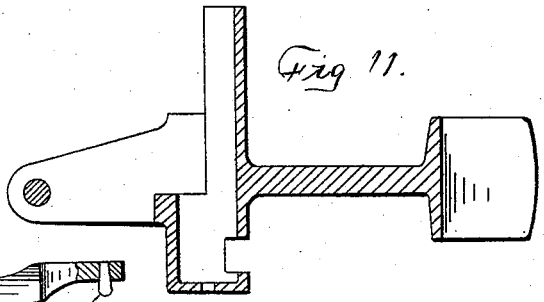


Fig. 7.

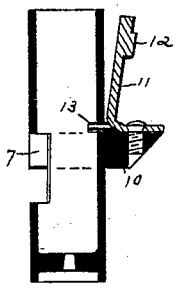


Fig. 14.

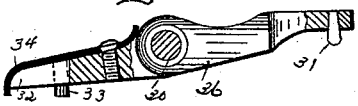


Fig. 15.

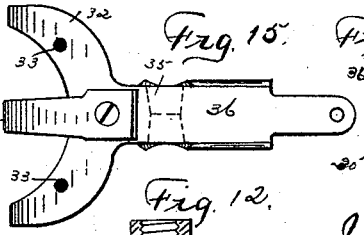


Fig. 16.

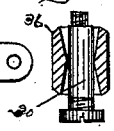


Fig. 17.

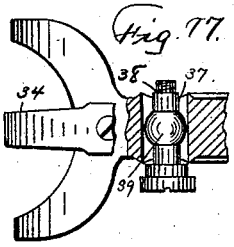


Fig. 18.

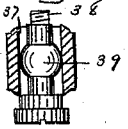


Fig. 12.

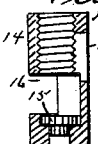
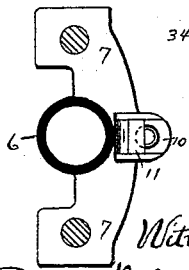


Fig. 13.

Fig. 8.



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J. MOFFAT & W. W. VIRTUE.

ANIMAL SHEARS.

No. 494,071. Patented Mar. 21, 1893.

Fig. 19.

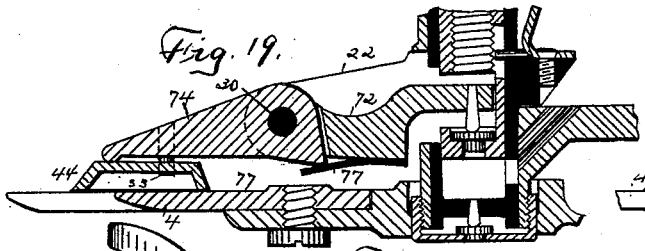

Fig. 20.

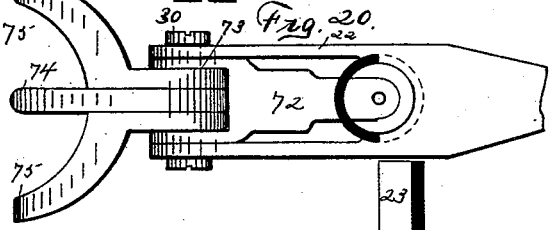

Fig. 21.

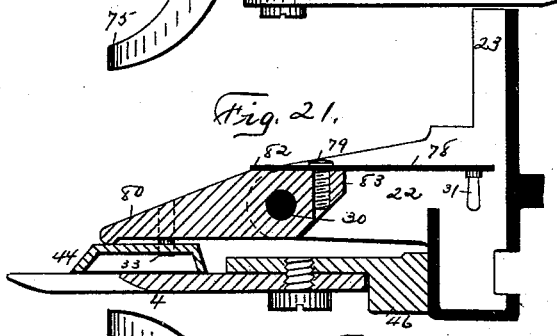

Fig. 22.

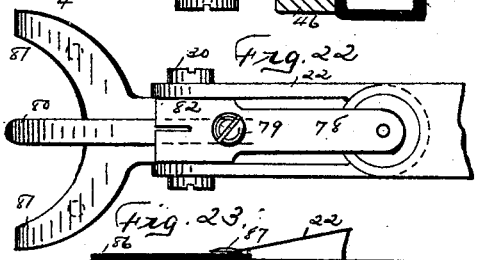

Fig. 23.

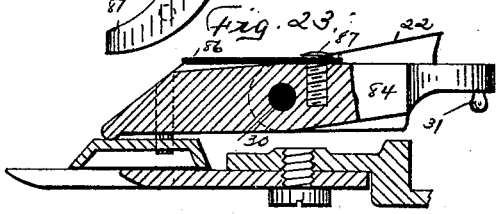

Fig. 24.

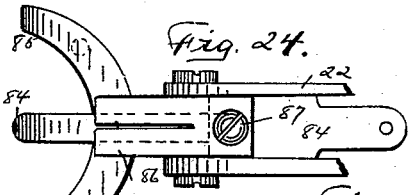

Fig. 29.

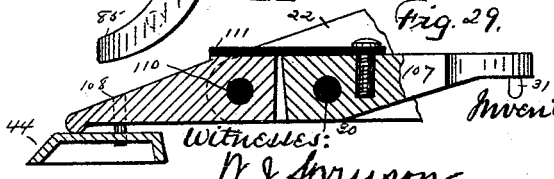

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Fig. 25.

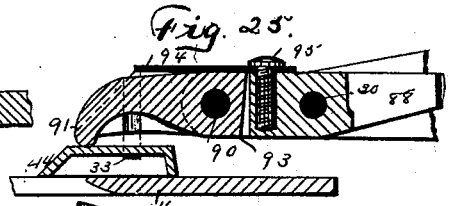


Fig. 26

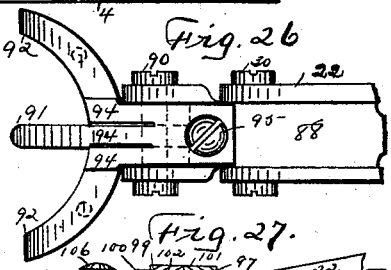


Fig. 27.

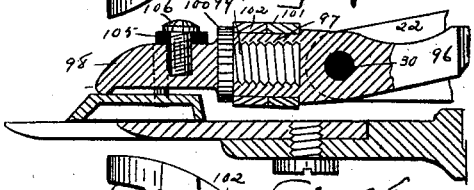
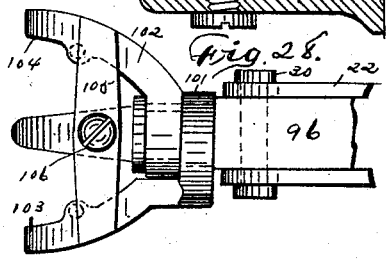


Fig. 28.



UNITED STATES PATENT OFFICE.

JOHN MOFFAT AND WILLIAM W. VIRTUE, OF SYDNEY, NEW SOUTH WALES.

ANIMAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 494,071, dated March 21, 1893.

Application filed January 4, 1892. Serial No. 417,008. (No model.)

To all whom it may concern:

Be it known that we, JOHN MOFFAT and WILLIAM WRIGHT VIRTUE, subjects of the Queen of Great Britain, and residents of Sydney, in the Colony of New South Wales, have invented certain new and useful Improvements in Machines for Shearing or Clipping Wool and for Cutting Hair; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in shearing or clipping machines, and more particularly to mechanism for regulating and varying the tension of the cutters with relation to the gathering-plate or comb over which they reciprocate.

The primary object of the present invention is to provide mechanism inclosed within the casing or shell of the machine whereby all necessary adjustments or variations of the tension of the reciprocating cutters may be effected without causing the tension cap to be raised or lowered relatively to the body or casing of the machine.

Further objects of the invention are to simplify and improve the construction of the vibrating or reciprocating lever, and to so combine the tension mechanism therewith as to insure an effective operation of both.

The invention will first be described in connection with the accompanying drawings forming a part of this specification, and then particularly pointed out in the claims at the end of the description.

In the accompanying drawings, Figure 1 is a central longitudinal section of a machine embodying our invention. Fig. 2 is a plan view of the case of the same, with the cover removed. Figs. 3 and 4 are respectively longitudinal central sections of the modified forms of the machine shown in Figs. 1 and 2. Figs. 5 to 18 inclusive are detail views of detached parts of the machine shown in previous figures, and modifications thereof. Figs. 19 to 29 inclusive represent a variety of forms of yielding forks or fingers adapted to bear upon the cutters of the machine, together with their respective tension devices, each of which will be separately referred to hereinafter.

Referring now to Figs. 1, 2, 5, 6, 7, 8 and 9, 1 denotes the machine case or shell having a lower lip 2, oppositely arranged jaws 3, stationary comb or gathering-plate 4, and laterally projecting lugs 5.

A indicates the vibrating lever consisting of a hollow hub 23, forwardly projecting wings 22, a shank *a* formed with an oil hole 25 and rearwardly projecting wings 24.

40 denotes the operating shaft of the machine carrying a balanced disk 41 from which projects an eccentric pin 42 provided with a bushing 43, which is square on its exterior to work between the wings 24 of the lever, and is secured upon the pin 42 by a screw plug *b*.

The casing or frame of the machine is formed with a lower seat or bearing *c*, and an upper inclosing ring 29, within which the hollow hub 23 of the vibrating lever, and mechanism arranged therein are supported. The lever hub 23 is provided at its lower end with a screw cap 26 in which is seated a step 27 which receives a hardened bearing pin 8, set in the lower end of a tubular case 6 which we will hereinafter refer to as the "motion tube." This tube extends throughout the length of the lever hub, and is formed with oil openings at the points 9 and 19, and with laterally projecting lugs 7 secured by screws *c* between the side lugs 5 and the cover ring 29 of the casing (see Fig. 5). The tube 6 is also formed with a rearwardly projecting lug 10 upon which is secured one end of a locking spring 11 having near its upper end a finger piece 12, a spline-pin 13 through the tube 6 at a point near the lug 10, to enter a slot in the tension slide 14, consisting of an interiorly threaded sleeve or tube arranged within the tube 6 and slotted at the point 17 to receive the pin 13.

Both the motion-tube 6 and the tension slide are formed with slots in their front sides (indicated respectively by *d* and 16) to permit the rear end *f* of the claw shank 36 to project therein. This shank is provided with a hardened pin 31 bearing upon a step 15 seated in the lower end of the slide 17, and said shank is secured by a cross-pin 30 to the forward wings of the vibrating lever. The opening 35 in the shank which receives the pin 30 is oppositely beveled (see Figs. 15 and 16) to permit a slight rocking movement of the shank.

Instead of oppositely beveling the opening 35 and employing a cylindrical pin 30, the opening may be made cylindrical and a pin $30^{\times}$ with a spherical enlargement 39 substituted for the pin 30.

18 indicates a tension screw engaging the threads of the slide 14, and connected at its upper end with a cap 20 formed with a toothed under rim 21, to be engaged by the locking spring. The tension claw consists of the shank 36 fitting between the wings 22 of the lever, and claws 32, between which is secured a central spring finger 34.

33 indicates dowel pins on the claws 32 to secure the knife or cutter 44.

The tension is varied, the cap 20 and the screw 18, do not rise or fall relatively to the body of the machine, but the rotation of the screw causes the slide 14 to move up and down within the motion tube 6, thus raising or lowering the shank of the tension claw as will be apparent. In its normal position, the tension locking spring 11 appears as in Fig. 1. When the tension is to be varied the thumb-piece 12 is depressed with the thumb of one hand until it clears itself from the teeth or notches 21 and thus leave the cap-piece 20 of the tension screw free to be turned with the other hand. The upper end of the hub 23 of the vibrating lever is semi-circular in section as shown in Fig. 9, and only half embraces the upper end of the motion tube. The spring 11 is located between the motion tube 6 and the cover-ring 29, the thumb-piece 12 projecting through a slot in the ring 29. A special advantage resulting from the construction thus described, is, that the working parts of the machine are completely inclosed, thus preventing fleece or hair from catching in or clogging the machine.

The construction of the tension claw shown in Figs. 14, 15, 16, 17 and 18 permits a limited rolling movement thereof, to equalize the tension upon the claws 32. Any preferred construction of the claws may be resorted to, and are here shown in a number of modifications in Figs. 19 to 31.

In Figs. 19 and 20 the shank of the tension claw is formed with fixed arms 73 fitting upon the pin 30. The fingers 74 and 75 are formed with eye-heads through which the pin 30 also passes. A spring 77 is arranged below the shank 36 to bear upon each of the fingers.

In Figs. 21 and 22, another modification is shown in which 78 is a spring secured by a screw 79 to the center finger and split to form two parts forward of the screw 79 each of which bears on the side fingers. The pin 30 passes through the wings 22 and the rear ends of the fingers, and the hardened point 31 is set in the rear end of the spring.

In the form of claw shown in Figs. 23 and 24, the resilient pressure is applied to only two of the fingers. 84 is the center finger forming also the shank of the claw and 85 are the side fingers. To the center finger a split spring 86 is secured by a screw 87 and the two leaves of this spring bear upon the back of the side fingers. The pin 30 passes through the wings 22 the rear ends of the side fingers and the shank of the center finger.

In the modification shown in Figs. 25 and 26, an independent wrist pin for the claw is used. 36^{a} is the shank of the claw, 89 bifurcated ends of the same, 90 wrist-pin, 91 center finger, 92 side fingers, 94 split spring secured to the shank by a screw 95.

In Figs. 27 and 28, 36^{b} indicates the shank of the tension claw, reduced and turned at the point 97. 98 is the center finger screwed into the shank 36^{b}. A collar 100 is formed on the center finger 98 and the side fingers 103 and 104 are each provided with a bored hub to receive the shank. A spring 105 is secured centrally upon the finger 98 and bears upon the side fingers as shown. In this construction, the center finger being solid with the shank exerts an unrelieved pressure upon the middle line of the knife or cutter, but the side fingers being depressed by the spring exert a resilient pressure upon the outer lines of the knife.

While the construction shown in Fig. 1 may be said to be our preferred construction, we do not confine ourselves to the combination with the other parts of the machine of either the tension slide 14 or the motion tube 6, as either of said parts may be omitted without rendering the machine inoperative.

In Fig. 3 we omit the motion-tube, and provide a bracket 56 to support the bearing point 8. In this construction a screw 54 is used in lieu of the spline 13, and the vibrating lever is slightly altered in construction as clearly shown in Fig. 11.

In the construction shown in Fig. 4, the form of the case of the machine is identical with that shown in Fig. 1; the motion tube modified in design and the tension locking spring as shown in that figure are also used. The bearing of the vibrating lever is not, however, rubbing, but rolling; it is taken on two or more series of antifriction balls, and the tension is resilient, not rigid as in the constructions previously described; it is applied by a spring, and the tension screw serves the purpose of varying the tension only.

It is found in practice that shearers are in the habit of applying tension much in excess of the degree actually required and thus causing injury to the machines; it is to obviate this disadvantage which attaches to the use of direct tension machines that the present modified construction has been devised. The spring is made very slightly stiffer than is necessary to apply the maximum tension which should be exerted, so that even when the tension screw is slacked back clear, excessive tension cannot be applied, and injury to the machine is therefore avoided.

57 is a step bearing in the foot of the hub of the vibrating lever, 58 motion tube, 59 foot piece slipped into the lower end of the motion tube, 60 hardened point set therein, 61 tension spring, 62 cap plate, 63 step bear-

ing, 64 hardened point set in the lower end of the tension slide piece 65, 66 tension screw, 67 oil chamber, 68 thumb-piece of tension screw, 69 antifriction balls, 70 oil holes, 71 collar or ring at head of motion tube. When the tension screw is operated to lift the slide-piece 65 the rear end of the tension claw is raised by the spring 61 and the tension thus increased; when the slide-piece is depressed the tension is diminished by a reverse action. The antifriction balls are put in when the vibrating lever is set in position, and the orifices through which they are inserted into their races are closed in any suitable manner.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a shearing or clipping machine, the combination with the machine casing, of a reciprocating lever provided with a hollow hub or bearing, tension fingers pivotally secured to the forward end of the lever, and bearing upon the cutters, a spring for depressing the fingers, and mechanism arranged within the hollow hub or bearing for controlling the tension of said springs, substantially as described.

2. In a shearing or clipping machine, the combination with a reciprocating lever provided with a hollow hub or bearing, of independently yielding fingers pivotally secured to the lever, and bearing upon the cutters, springs for depressing the fingers, and mechanism arranged within the hollow hub or bearing common to all the springs for adjusting the tension thereof, substantially as described.

3. In a shearing or clipping machine, the combination with the machine casing, of a reciprocating lever provided with a hollow hub or bearing, tension fingers or forks pivotally secured to the forward end of the lever and bearing upon the cutters, a rocking bearing therefor, and mechanism arranged within the hollow hub or bearing for controlling the tension of said fingers or forks, substantially as described.

4. In a shearing or clipping machine, the combination with the casing, and its bearings, of a reciprocating lever having a hollow hub; a motion tube arranged within said hub; a tension slide arranged within the motion tube, and a tension screw for operating said slide, substantially as described.

5. In a shearing or clipping machine, the combination with the tension-claw and the reciprocating lever having a hollow hub or bearing, of a tension slide slotted to receive the rear end of the shank of the tension claw; and a screw provided with a cap for operating said slide, substantially as described.

6. In a shearing or clipping machine, the combination with the tension claw, and the reciprocating lever having a hollow hub or bearing, the tension slide, and the screw provided with a cap for operating said slide, of a locking spring secured at a point within the machine casing and engaging the lower edge of said cap, substantially as described.

7. In a shearing or clipping machine, the combination of a motion tube or hollow spindle at the center of vibration, a tension slide-piece, and mechanism for moving the slide-piece up and down in the tube, said slide-piece being in connection with the tension-claw, substantially as described.

8. In a shearing or clipping machine, the combination with the machine casing, of a reciprocating lever provided with a hollow hub or bearing and at one end with forwardly extending wings to which the tension finger shank is pivoted, and at the other end with rearwardly extending wings to receive the power transmitting devices, tension fingers pivotally secured to the forward end of said lever, springs for depressing said fingers and mechanism arranged within the hollow hub or bearing for adjusting the tension of said springs, substantially as described.

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