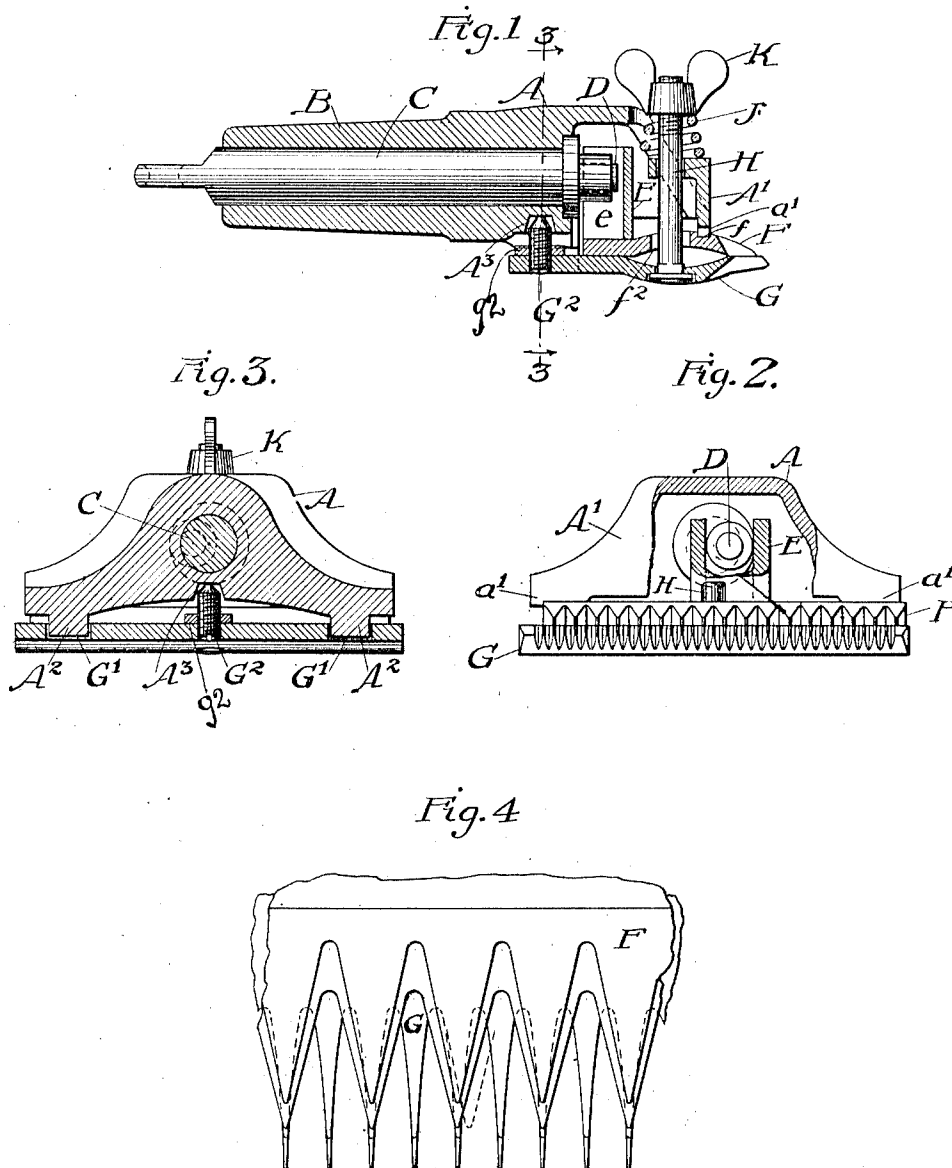


J. K. STEWART.
ANIMAL SHEARS OR CLIPPER.
APPLICATION FILED MAY 28, 1909.

994,883.

Patented June 13, 1911.



Witnesses:

Frank S. Blanchard
J S Abbott

Inventor:
John K. Stewart
By Burton Burton
his Attorneys.

UNITED STATES PATENT OFFICE.

JOHN K. STEWART, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO FLEXIBLE SHAFT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ANIMAL SHEARS OR CLIPPER.

994,883.

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To all whom it may concern:

Be it known that I, JOHN K. STEWART, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Animal Shears or Clippers, of which the following is a specification, reference being had to the drawings forming a part thereof.

This invention relates to animal shears, particularly of the type commonly called "horse clippers."

It consists in the features of construction shown and described as indicated in the claims.

In the drawings:—Figure 1 is a fore-and-aft vertical section axial with respect to the driving shaft of a clipper embodying this invention. Fig. 2 is a full size front elevation of the vibrating cutter and operating crank and adjacent portions of the case, the case being partly broken away. Fig. 3 is a sectional elevation taken as indicated at line 3, 3 on Fig. 1. Fig. 4 is an exaggerated detail plan view of portions of the two cutters.

The clipper in which this invention is shown embodied in the drawings is of familiar type except as to the feature constituting the invention. It will first be described in its general familiar construction. It consists of the head or housing, A, from whose rear end protrudes the handle and shaft bearing, B, in which is journaled the operating shaft, C, having at its forward end a crank pin, D, which engages a vertical channel, *e*, in the upstanding arm, E, of the vibrating cutter, F, which is guided for reciprocation transversely of the axis of the driving shaft by the engagement in a longitudinal groove, *f*, of two downwardly extending projections, *a*¹, at the ends of the front lip, A¹ of the housing, A.

G is the fixed cutter, which is held in proper relation to the head and vibrating cutter by engagement of two studs or pins, A², A², which project down from the rear side of the head into the apertures, G¹, G¹, in said comb or fixed cutter, G, for positioning the latter longitudinally with respect to the head, and by the bolt, H, which extends through both cutters and through the head, above which it receives the pressure spring, J, and above the spring a nut, K, for tightening it and holding it with yielding pres-

sure upward against the vibrating cutter, 55 which has a longitudinal slot, *f*², to permit it to play on the bolt, H. In order to cause the cooperating faces of the comb and vibrating cutter,—being the upper face of the comb and the lower face of the cutter,—to obtain the perfect contact necessary for cutting, it is necessary either that the guide bearing of the vibrating cutter on the ends of the lugs, *a*¹, should be perfectly parallel to the upper face of the comb and also to the lower face of the vibrating cutter, or that the comb should be adapted to accommodate itself to any divergence from parallelism of these two parts. Such divergence is liable to occur from unequal wear of the lugs, *a*¹, or in the re-grinding of either the comb or cutter; and to provide the necessary accommodation the comb has customarily been constructed with a point of bearing at the rear edge upon the head in a fore-and-aft line midway between the two projections, *a*¹, which by determining the position of the vibrating cutter determines the direction which the fixed comb should assume in order to make perfect contact with that cutter, such third bearing affording a point over which the comb may rock at the rear to accommodate its position at the forward or cutting edge to that of the vibrating cutter. 80

For clipping horses and like uses the comb has comparatively fine teeth, as shown, and the vibrating cutter has its teeth spaced twice as widely as those of the comb,—that is, so that the consecutive teeth of the cutter will coincide at a given position with alternate teeth of the comb; and the stroke of the vibrating cutter for its work is at least the distance between the points of its teeth,—that is, the distance between alternate teeth of the comb; and the limits of stroke for greatest efficiency should be with the teeth of the cutter coinciding with alternate teeth of the comb. With this construction, which is the standard construction, it will be seen that at the end of each stroke in either direction the teeth of the vibrating cutter have completely passed the cooperating edges of the teeth of the comb and stand registered or coincident with said teeth,—that is, with the alternate teeth of the comb,—so that any hair or fiber which has been engaged between the teeth of comb and cutter in the stroke will be completely severed, and no 105

hairs will be left pinched and unsevered between the teeth. This prevents pulling of the hair as the tool operates while being advanced to its work; and any construction or condition which causes the stroke of the vibrating cutter in either direction to terminate short of the position indicated creates liability to pulling the hairs which may be engaged or pinched between the crossing edges of the teeth near their points and not completely severed by the stroke.

Considering the change of position of the cutting face of the vibrating cutter and of the points of its teeth which may result from oblique grinding or unequal wear of the two guide projections, a^1 , it will be noticed that the limits of the stroke of said cutter correspond to the extreme positions of the crank pin, D, in a line through the axis of the shaft, C, parallel to the path or guide bearing of said cutter; and that if this path is deflected by unequal wear of the projections, a^1 , these limits will be shifted one way or the other by an amount equal to the chord of the arc which will be struck by a radius whose length is the distance from the axis of the shaft to the plane of contact of the comb and the cutter, moving through said angle of deflection. If the axis of the shaft were in the plane of travel of the cutter there would be no disturbance of the limits of the cutter's stroke resulting from such deflection of its path; but this impracticable, and such disturbance does in fact occur whenever there arises a deflection of the guide path of the cutter, and the consequence is failure of the vibrating cutter to reach said limits, or at least the edges of alternate teeth of the comb, with the resulting liability pointed out of engaging or pinching a hair without severing it, and consequently of pulling the hair in the process of clipping. This disturbance of the limits of the stroke would of course be compensated so as not to result in the pinching of the hairs above described if the comb could at the same time be similarly deflected; and such similar deflection would result if the rocking point of the comb were at the shaft axis so that the two parts,—comb and vibrating cutter,—would tilt over the same line in the deflection indicated.

Hitherto, so far as I am aware, the provision for rocking the comb to accommodate it to the cutter has been made by providing the rocking point at the rear by means of a downwardly extending projection from the head, the upper face of the comb at its rear part being kept in perfect plane with the upper face of the teeth at the forward part,—that is, with the portion of the face which cooperates with the vibrating cutter. Such coincidence of planes of the rear and forward portion of the comb is necessary in order that the comb may be readily and ac-

curately ground; but the formation of the rocking point for the comb in the manner described causes such rocking point to be as remote as possible from, instead of as near as possible to, the axis of the shaft or point over which the vibrating cutter swings in the deflection mentioned. The purpose of this invention is to overcome this defect and cause the deflection of the two cooperating members from their original or properly related positions to be as nearly equalized as possible so as to avoid or diminish the liability of pinching of hairs from the cause indicated; and this is effected by locating the rocking point for the comb as high as it can be located,—that is, as near to the axis of the shaft as possible instead of as low as possible, as heretofore. For this purpose the heel of the head,—that is, the point directly under the shaft bearing at the rear,—is recessed as deeply as possible without cutting through the bearing or unduly weakening the head at that point, such recess being shown at A^3 , and the comb or fixed cutter is provided with a removable stud, G^2 , adapted to be made tight in the upper side of the comb, but so that it can be withdrawn, such stud projecting up into the recess, A^3 , to form the rocking bearing of the comb at the upper end of said stud and bottom or deepest point of the recess. The removability of the stud is desirable in order that the fixed cutter may be accurately ground as above indicated. In practice, the approximate equalization of the deflection of the two cutters which results from this new feature of construction is sufficient to prevent the hair pinching, because, as will be readily understood from Fig. 4, points of the teeth of the vibrating cutter stand back a little from those of the comb which have therefore a little width at the point where the cutter teeth travel over them, and to the extent of this width the limits of the stroke may be varied without preventing the complete passing of the cutting edge of the vibrating cutter over the cutting edge of the comb and the complete severance of any engaged hairs.

By making the stud G^2 as a screw screwed into the comb and secured by a jam nut g^2 it is adapted to serve as a means for effecting an adjustment which is sometimes desirable to correct defective cooperation of the two cutters which arises from a tendency of the cutters to wear away a little faster at the points than farther back. The correction obviously consists in tilting the lower cutter or comb a little downward at the rear so that its upper face instead of being co-incident with the lower face of the upper cutter is at a very slight angle thereto which compensates for the slight wear mentioned and brings the points of the cutters again into working relation without separating the teeth back of the point far enough to ma-

terially effect their cutting in view of their greater rigidity back of the points where they are wider. It will be noticed that such adjustment of the comb or fixed cutter G downward at the rear has no effect upon the relation of its fulcrum or rocking point to the plane of contact of the cutter piece such fulcrum remaining always at the upper end of the stud G² however much or little that may project upward from the comb. The two functions therefore of this stud, one independent if its adjustability and consisting merely in its projecting upward to afford a rocking point for the comb as near as possible to the shaft axis, and the other dependent upon its adjustability in the comb are entirely consistent and free from interference with each other.

I claim:—

1. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head and an element for actuating the vibrating cutter which engages the cutter above the plane of its contact with the comb, and means constituting a rear bearing for the comb on the head for rocking transversely, such bearing being elevated above the plane of contact of the comb and cutter toward the plane of engagement of the actuating element with the latter.

2. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb and having a guide bearing on the head; a crank shaft whose crank engages the vibrating cutter for reciprocating it on the comb, said cutter having an upwardly extending arm for such engagement, and means constituting a rear bearing for the comb on the head for rocking transversely, such bearing being elevated above the plane of contact of the comb and cutter toward the axis of the shaft.

3. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb and having a guide bearing on the head, and an actuator for the cutter which engages it above the plane of its contact with the comb, the comb having an upwardly projecting stud at the rear intermediate its ends which bears against the head to form a rocking bearing for the comb nearer the plane of engagement of the actuator with the cutter than the plane of the contact of the latter with the comb.

4. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb and having a guide bearing on the head, and an actuator for the cutter which engages it above the

plane of its contact with the comb, the head being recessed upwardly above the rear portion of the comb, and the comb having an upstanding stud which bears against the head at such recess.

5. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head, and a crank shaft whose crank engages the vibrating cutter for reciprocating it on the comb, the cutter having an upwardly extending arm for such engagement, the head being recessed upwardly at the rear part under the shaft bearing, and the comb having an upstanding stud which bears against the head at such recess.

6. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head; means for actuating the vibrating cutter, and a vertically adjustable upstanding stud in the rear part of the comb whose upper end forms the bearing of the latter against the head said stud being threaded for vertical adjustment.

7. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head; an element for actuating the vibrating cutter which engages said cutter at the opposite side thereof from the comb and at a distance from the plane of vibration of the comb-contacting surface of the cutter; and a part projecting from the comb terminating in contact with the head at a distance from said plane of vibration of the cutter at the side of that plane at which the actuating element engages the cutter.

8. A clipper comprising a head; a comb or fixed cutter held to the head and stopped against edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head; an element for actuating the vibrating cutter which engages said cutter at the opposite side thereof from the comb and at a distance from the plane of vibration of the comb-contacting surface of the cutter; a part projecting from the comb terminating in contact with the head at a distance from said plane of vibration of the cutter at the side of that plane at which the actuating element engages the cutter, said projection being screw-threaded for adjustment on the comb transversely to said plane.

9. A clipper comprising a head; a comb with fixed cutter held to the head, and stopped to edgewise movement thereon; a cutter vibrating on the comb having a guide bearing on the head; an element for actuating the vibrating cutter which engages said cutter at the opposite side thereof from the comb, and at a distance from the plane of

vibration of the comb-contacting surface of the cutter; a stud set in the comb and projecting therefrom toward the head and terminating in contact with the head at a distance from said plane of vibration of the
5 cutter at that side of that plane at which the actuating element engages the cutter, said stud being movable in the comb transversely to said plane, and means for holding it at

any position to which it may be moved in the comb. 10

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 24th day of May, 1909.

JOHN K. STEWART.

Witnesses:

J. S. ABBOTT,

M. GERTRUDE ADY.