J. C. WIGHTMAN.

SHEEP-SHEARS.

No. 194,794. Patented Sept. 4, 1877.

*Fig. 1.*

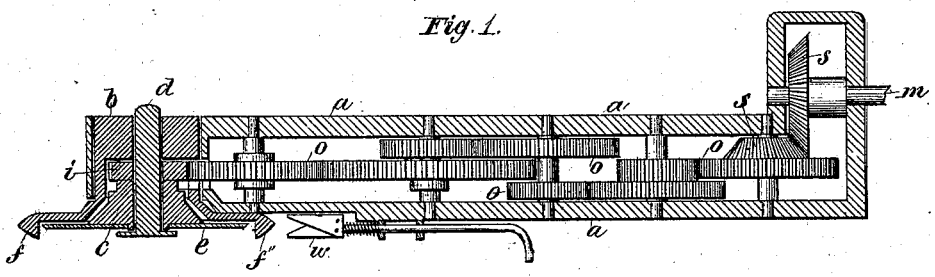


*Fig. 2.*

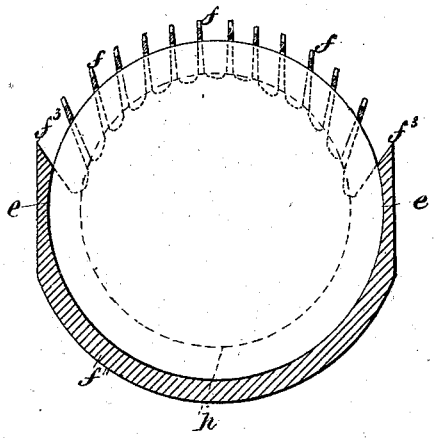


*Fig. 3*


*Fig 4.*


*Witnesses.*

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## IMPROVEMENT IN SHEEP-SHEARS.

Specification forming part of Letters Patent No. **194,794**, dated September 4, 1877; application filed January 16, 1877.

*To all whom it may concern:*

Be it known that I, JOSEPH C. WIGHTMAN, of Boston, county of Suffolk, Massachusetts, have invented a Power Sheep-Shears, of which the following is a specification:

The object of my invention is to shear sheep by the application of suitable devices to a rotary circular knife.

The invention is illustrated in the accompanying drawings, to which reference is herein made, of which—

Figure 1 is a vertical sectional view of the whole device, drawn longitudinally. Fig. 2 is a plan view, showing the form of teeth and spaces on the comb or guard, and the relation of the circular knife thereto; and Figs. 3 and 4 are vertical sectional views, drawn longitudinally, showing variations of my invention of the teeth of the comb or guard, and the position of the knife to them.

Similar letters represent similar parts in the different drawings.

Referring more especially to Fig. 1, *a* represents a hollow handle containing a train of gears, *o*, which connects at one end with bevel-gears *s* and spindle or shaft *m*, to attach to any suitable means of transmitting power, and at the other end connected with the gear *i*, operating the cutter-support *c* and the cutter *e*. This handle is made of such shape as to support, at the end opposite the end receiving the transmitted power, the shearing device proper.

The train of gears *o* is so arranged as to largely increase the speed of the cutter *e* beyond that given to the shaft *m*; but I do not restrict myself to the use of any special device or mechanical means for producing motion in the cutter.

The shearing device proper, and which is supported by, fastened to, and operated from, the handle *a*, consists of a comb or guard, *f*, which extends upward, as shown, forming a shell or covering, *b*, for the knife *e* and its support *c* and the gear *i*, as also a firm bearing, into which the spindle *d* is fastened, and around which spindle *d* revolves the gear *i*, the knife-support *c*, and the knife *e*. The knife *e* is fastened to the support *c* by any suitable means that will admit of readily removing the knife *e*, and replacing it with a new one, when it is desirable; and the spindle *d* is also secured so as to be easily removed, permitting by such removal the removal of the knife *e* and its attachments.

The knife *e* consists of a thin disk or circle of steel, sharpened on its peripheral edge, and made to rotate upon its center. Its relation to the comb *f f''* can be also seen in Figs. 2, 3, and 4.

It is not desirable to have the knife *e* run so as to touch the surface of the comb or guard *f f''*; but it should run as closely as it can and not touch.

The comb *f f''* may be made in separate pieces, and be held or fastened in position to operate together; but I prefer it made from one piece of suitable metal, as brass, bronze, or steel. Its upper part consists of the shell, already mentioned, containing the gear *i* and cutter-support *c*, as also its solid extension *b*, holding the spindle or shaft *d* in place. Its lower part consists of the comb or guard proper *f* and *f''*, which consists of a flat circular disk of metal, having teeth or points *f* cut in its front, and left solid at the rear at *f''*, and it also has a depression or channel in and below its surface as large in diameter as the knife *e*, and in which the knife *e* is incased and runs. The metal left on the outside of this channel forms a guard against the knife *e* cutting the sheep in any direction, and the distance between the lower edge of this guard *f* and the cutting-edge of the knife *e* regulates the length of the clip left on the sheep. It further answers the essential purpose of preventing any wool which might loop over the comb-teeth *f* from passing between the comb-teeth *f* and the knife *e* without being cut.

Figs. 3 and 4 are illustrative of the two applications of my invention for accomplishing this purpose. Fig. 3 shows the channel cut from the under side of the comb, and Fig. 4 shows the channel cut from the upper side of the comb. Preferably, I should use my invention as shown in Fig. 4.

The teeth of the comb *f* are made to project horizontally beyond the edge of the knife *e*, so that under no circumstances will the knife *e* reach the body of the sheep. These teeth *f* are quite thin, so as to easily penetrate the wool, and at the points slant to both top and

bottom surfaces, so as to give a lancet-point shape to them. In addition to their office of guarding against the cutting of the sheep, they also serve to firmly hold up the wool in the spaces between them, so that the knife *e* may more effectually cut it.

The operation of the outside comb-teeth is peculiar, and forms part of my invention.

It will readily be perceived that as the knife *e* is sharpened it will be reduced in diameter, and if all the teeth in the comb were parallel to each other, that a very small reduction of the diameter of the knife *e* would leave in the spaces between the outside teeth a portion of the wool that could not be cut, and would prevent the action of the device. To obviate this I have assumed that a knife two and one-half inches in diameter can be used until it is ground down, by sharpening, to two inches in diameter, and have slanted the inside edge of the outside teeth, so that any wool gathered by these teeth will be guided to and cut by any knife that may vary from two and one-half to two inches in diameter. These dimensions are not arbitrary, however, but serve to illustrate my invention.

The balance of the teeth in the comb are placed so as to divide up the slant or angle they would follow if conforming to the lines of the outside teeth, the object being to obtain teeth leaving, as nearly as possible, parallel-sided spaces between them.

In Fig. 2, *e* represents the knife, and the dotted line *h* represents the same reduced by sharpening. The slant of the outside teeth $f^3$ will illustrate the action here described in the relation of the teeth to the two sizes of the knife at *e* and *h*.

On the under side of and fastened to the handle *a*, Fig. 1, is a device for sharpening the cutter *e*, lettered *w*. This device consists of two thin pieces of steel, quite hard, fastened close together, and forming a V-shaped opening. They are attached to a wire or rod, which is surrounded by a spiral spring, which may be made to withhold the sharpener from the knife *e*, or to force the sharpener against the knife *e*, when desired. This device gives the operator the ability to sharpen the cutter while shearing.

I do not confine myself to this particular form of sharpener, as any other sharpening device which can be operated from the handle *a* will answer my purpose. Neither do I claim the method of sharpening by two pieces of steel forming a V, as herein described, the same being an old and well-known device.

It is necessary that the cutter should run at a high rate of speed, in order to operate successfully — say, from two thousand five hundred to four thousand revolutions per minute—though fairly rapid work can be done at less speed.

The advantages of my invention are that as the sand in the wool is necessarily loosely held, the knife pushes it away before it seriously affects its cutting-edge; the knife, when dulled, can be instantly sharpened while shearing by a movement of the operator's thumb or finger, and no time is lost in doing it; and when the cutter does wear out, which is the only part to wear out by use, it can be replaced for a few cents, and requires no adjustment to make it operate.

I claim as my invention for shearing sheep—

1. The comb-plate or guard-plate, having within its upper or lower surface a channel or space in which to operate circular revolving knife or cutter.

2. In combination with the channeled or spaced comb-plate, substantially as described, a revolving circular knife.

3. The comb-plate or guard-plate, having its teeth so formed that lines drawn as a continuation of them will meet back of the center of the comb-plate, the points of all the teeth being equidistant, the lines of coincident teeth only meeting at the same point.

JOSEPH C. WIGHTMAN.

Witnesses:

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R. E. CHERRINGTON.