Dec. 11, 1934. E. J. CASSELMAN 1,983,597

MACHINE FOR TESTING THE SHARPNESS OF BLADES

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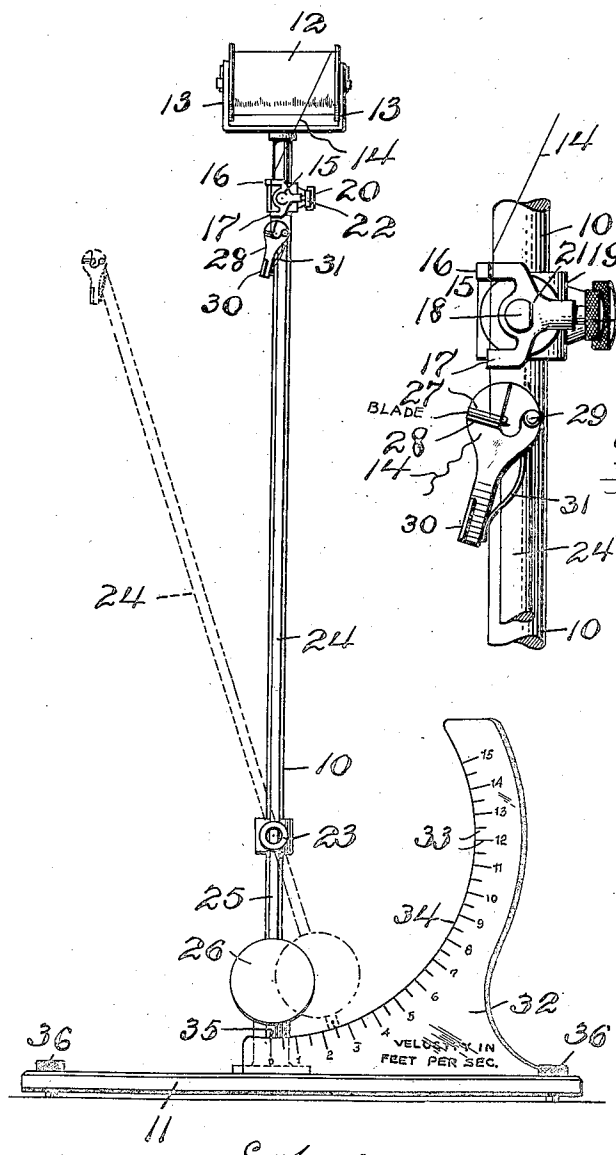


Fig. 1

Fig. 3

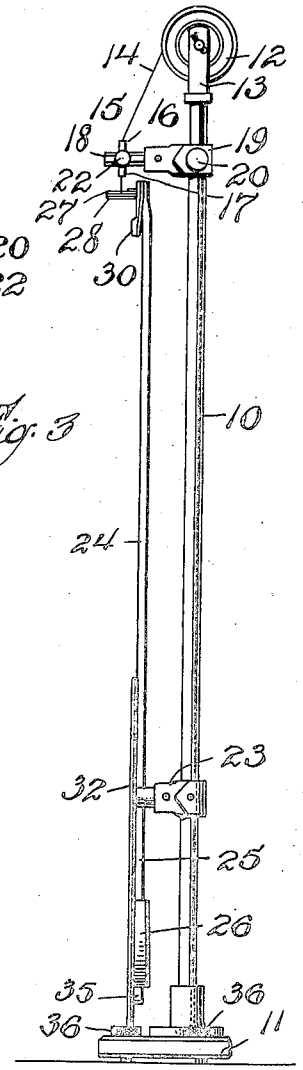


Fig. 2

INVENTOR
Elbridge J. Casselman.
BY
Wm. H. Canfield.
ATTORNEY

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MACHINE FOR TESTING THE SHARPNESS OF BLADES

Elbridge J. Casselman, Pittsburgh, Pa., assignor to Magazine Repeating Razor Company, New York, N. Y.

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3 Claims. (Cl. 265—13)

This invention relates to an improved device for measuring and evaluating the sharpness of blades in a quantative manner. The device is constructed to provide means for measuring the velocity at which a blade is used to perform a desired cutting operation. In the machine herein set forth I use a fibre which is placed in the path of the propelled blade, the propulsion of the blade being controllable and predetermined. In quantitative testing I prefer to use a standard fibre which is tested under standard conditions and I have found by tests that by actual shaving tests the operation has been corroborated as quantative measures of the shaving quality of the blade.

The invention is designed to provide a mechanism by means of which the old operation of cutting a fibre is utilized, usually by cutting a suspended fibre although the fibre can be supported, if desired, at both ends. The blade propelling and holding means can subject the fibre to a predetermined cutting pressure. It is further possible with my improved machine to measure the velocity that is required to cut the fibre. In this way the machine is designed to give a quantative result. I am aware that other devices have been used for the purpose of testing the edges of blades. For instance, blades have been projected into stacks of thin paper sheets but each slice into the stack dulls the blades to an extent equivalent to one shave when the blade is a razor blade. Another is an instrument in which a blade is swung against the edge of a paper sheet and the depth of the cut into the sheet is measured. These devices are unsatisfactory particularly in view of the fact that they dull the blade in the test.

The machine which is the subject of this invention operates on the principle of measuring the velocity of the blade which cuts a standard fibre under certain standard conditions.

The invention is illustrated in the accompanying drawing in which Figure 1 is a front view of a machine embodying my invention. Figure 2 is a side view of the machine illustrated in Figure 1. Figure 3 is an enlarged front view of the fibre holder and the blade clamp.

The fibre which is used in testing may be supported in various ways but I prefer to suspend the fibre which enables the test to follow that used by barbers who cut a hair to test the sharpness of a blade. This is utilized to enable a quantative result to be arrived at.

In the form of machine illustrated the standard 10 projects upwardly from the base 11 and is provided with means for supporting a spool of fibre. The spool is shown at 12 rotatable between the bracket arms 13. The fibre is shown at 14. Directly below the spool is the grip or holder 15 for holding the fibre 14 with one end depending from the grip. The grip 15 is illustrated as including two horizontal jaws 16 and 17 against which the fibre rests and in which the fibre is grasped but loosely enough to enable the fibre to be pulled through easily by hand. The jaws are at the end of an arm 18 on a collar 19 which is held on the standard 10, usually by the set-screw 20. The jaws 16 and 17 are preferably on a separate piece 21 held on the arm 18 by the set-screw 22.

The blade is carried against the fibre by a controllable means. I show the compound pendulum pivoted at 23 to enable the upper arm 24 of the pendulum and the lower arm 25 to swing freely. The arm 25 is weighted. I show the weight 26 as the weight of the pendulum. The lower arm 25 is the shorter. The upper arm is provided with a blade clamp to hold a blade in a position to engage the fibre 14 at about one-half inch below the fibre grip 15.

The blade is clamped in a position to engage the fibre edgewise with its long axis horizontal with its cutting plane sloping downwardly at approximately 20 degrees when the pendulum is at rest. The clamp illustrated comprises a fixed jaw 27 and a movable jaw 28 pivoted at 29 and having a finger piece 30 for releasing the jaw 28. A spring 31 yieldingly holds the jaw 28 in clamping position.

A scale plate 32 is arranged adjacent the path of travel of the pendulum with a scale 33 adjacent the curved edge 24. The end of the arm 25 registers on the scale. The graduation marks are for regulating the speed of the pendulum by indicating the point from which the pendulum starts to cause the blade to engage the fibre at a predetermined speed. The machine illustrated shows marks indicating the velocity in feet per second. Thus the speed indicated by the mark at which the pointer is released corresponds to the velocity of the blade at the centre of the swing when it contacts with the fibre.

In a machine of a size for testing razor blades the fibre is suspended so that an approximate length of four inches hangs freely below the grip 15. The longer arm 24 of the pendulum is approximately 18 inches long and the shorter arm 25 has its pointer tip approximately seven inches from the pivot 23. The cutting edge of the blade is positioned to engage the fibre at about one-half inch below the grip 15. A pendulum of this size with its proper weight 26 gives to the pendulum

a swing of about one second for a complete forward and backward swing. Suitable levelling devices 36 can be provided for adjusting the position of the machine.

In practice the blade to be tested is placed in the clamp 27—28. Then a length of fibre is drawn from the spool 12 and suspended below the grip 15. Then the pendulum is drawn back by hand to any one of the graduation marks and released. A note is made of the graduation mark and whether the fibre is cut at any point on the first or subsequent swing. It is usually found that there is a range of velocities, below the lower limit of which the fibre is not cut at any point on the first or any subsequent swing, and above the upper limit of which the fibre is cut off clean at the point of contact with the blade on the first swing, and within which the fibre may be cut off at some point lower than the point of contact with the blade on the first or some subsequent swing. Experience has shown that when the standard fibre is "Bemberg" rayon, called "15 denier, 25 filament" by the trade, the range for new sharp blades is from 2 to 8 ft./sec. and the range for used discarded blades is from 9 to 15 ft./sec. The range for the best new blades is of the order of 1 to 2 ft./sec.

Various changes can be made in the form and proportion of the parts without departing from the scope of the invention which embodies the machine for measuring the velocity that is required to cut a standard fibre under standard conditions.

This operation has been corroborated by actual shaving tests which tests indicate that the operation is a quantative measure of the shaving quality of a blade.

I claim:—

1. A machine for testing the sharpness of blades comprising a holder for a fibre, a pendulum including a clamp for a blade whereby a clamped blade can be swung edgewise against the fibre, and a gage for regulating the starting point of the pendulum.

2. A machine for testing the sharpness of blades comprising means for suspending a fibre, a compound pendulum having a blade clamp at one end, and a scale adjacent the other end for indicating various starting points for the pendulum.

3. A machine for testing the sharpness of blades comprising a spool support, a fibre support for suspending fibre fed from the spool, a compound pendulum, with means for clamping a blade at one end of the pendulum, and a scale on which the other end of the pendulum registers.

ELBRIDGE J. CASSELMAN.