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J. F. KOEHLER
SHAVING IMPLEMENT

2,086,716

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Fig. 4

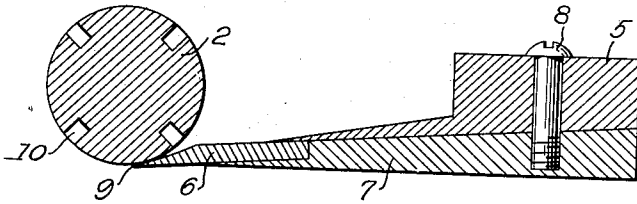


Fig. 3

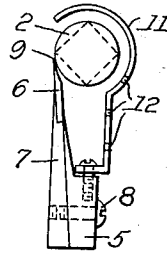


Fig. 1

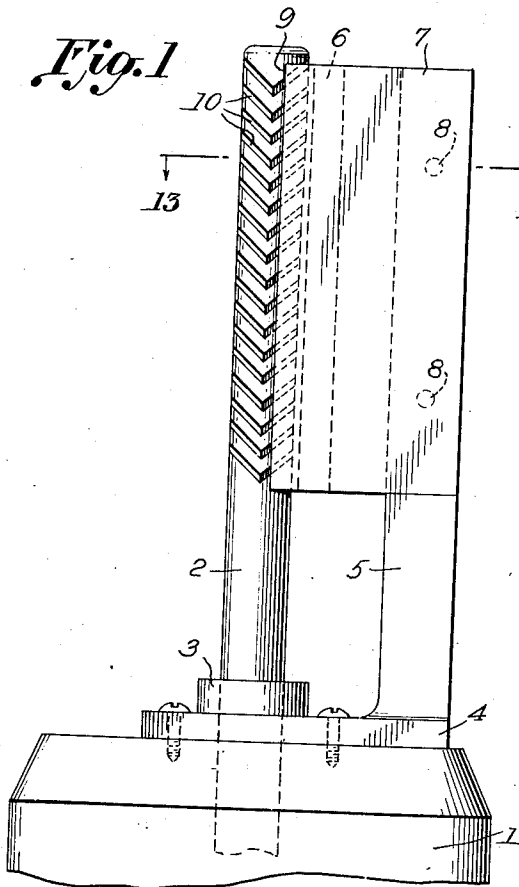


Fig. 2

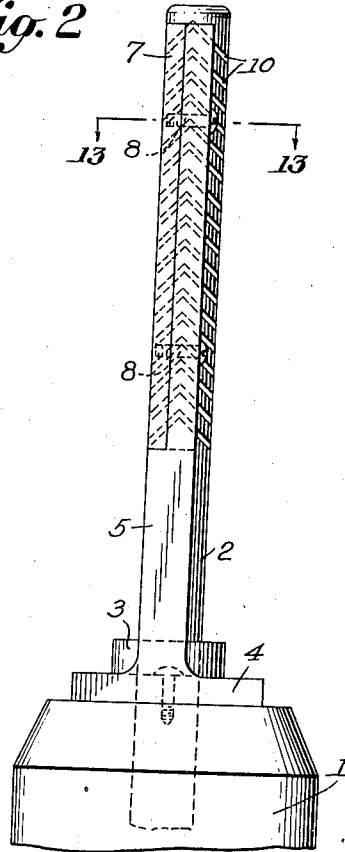
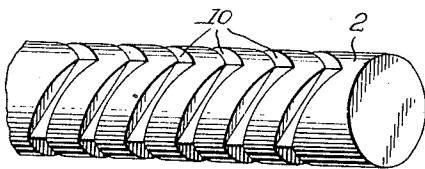


Fig. 5



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UNITED STATES PATENT OFFICE

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SHAVING IMPLEMENT

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4 Claims. (Cl. 30-43)

This invention relates to an improved shaving implement which is easily manipulated and which is used to secure a close shave with rapidity and safety. The machine does not require the use of lather.

The invention comprises an implement in which a sharpened blade rests flatly against the skin, the cutting edge being immediately adjacent to the skin, and a rotating slotted cylinder beats the hairs against the cutting edge. The slots in the cylinder are sufficiently narrow so that the skin cannot enter them, and is therefore prevented from being cut by the keen edge.

This form of machine provides a very close shave, for by the disposition of the cutting edge, the hairs are cut off flush with the skin. The rotating cylinder presents only a small arc of its circumference to the skin, the blade edge touching the cylinder but slightly to the rear of the point of tangency with the skin, and a guard being brought around the cylinder on the opposite side almost into contact with this tangent plane. The small area of contact which the cylinder makes with the skin, together with the small speed of rotation and the small diameter of the cylinder, act to cause practically no discomfiture as the cylinder moves over the skin. Nor are the narrow slots in the cylinder uncomfortable to the skin. The entire instrument can be easily and safely moved about on the surface of the skin.

The invention also comprises various details of the construction which details will be more fully set forth hereinafter and will also be embodied in the claims.

The invention is illustrated in the accompanying drawing in which Figure 1 is a front view of a shaving implement embodying my invention. Figure 2 is a side view of the same. Figure 3 is an end view of the shaving head only and omits details of the base and handle. In Figure 4 is also shown a method for attaching a guard about the rotating cylinder, which guard has been omitted from all other figures for the sake of showing detail. Figure 4 is an enlarged section of the shaving head taken on the line 13-13 in Figures 1 and 2. Figure 5 is a perspective view of a portion of the rotating cylinder.

The machine comprises a handle 1 which fits the hand and contains some appropriate source of power, such as an electric motor, or the end of a flexible shaft. From the handle projects a rotating cylinder 2, attached to the source of power. No further bearings for this cylinder are required beyond those centering the source of power. A bearing may be incorporated in the collar 3 at-

tached to the base plate 4. The base plate 4 is attached to the handle 1 by screws or other suitable means, and a post 5 is made a rigid part of the base plate. The post 5 carries the cutting blade 6, which blade is replaceable when necessary, and is firmly held on the somewhat enlarged outer end of the post by the clamping plate 7 which is drawn tightly against the blade and the post by the screws 8. The clamping surface of the post and the inner surface of the clamping plate are shaped to firmly hold the cutting blade in such a position that its cutting edge 9 is the only part of the blade in contact with the rotating cylinder 2. The outer surface of the clamping plate 7 presents a smooth surface to the skin.

The contact line 9 of the cutting blade 6 and the curved face of the rotating cylinder 2 is located almost upon, or slightly to the rear of the line of tangency made by the skin upon the cylinder, and the two lines are parallel. When properly set for a close shave, the cutting edge is not more than ten one-thousandths of an inch behind the tangent line, as measured along the direction of the skin surface, so that the hairs are severed almost exactly at the surface of the skin. It has also been found that when so adjusted the cutting blade 6 shows no tendency to dig into the hard, smooth cylindrical surface.

The rotating cylinder is provided with slots 10 into which the hairs may project, and the rotation of the cylinder is directed to bring the hairs against the cutting edge. The slots are cut narrow so that the skin cannot enter them, and the cylindrical surface therefore acts as a guard to prevent the skin being brought against the cutting edge and injured. The most efficient arrangement of slots seems to be the herring-bone pattern, which is easy to construct, and is illustrated in the drawing. It comprises several series of slots 10, each series being sawed or milled or ground along a part of the curved face of the cylinder, all slots of one series being in plane laminae which constitute a parallel set. Any slot in one series is of such depth that it cuts through all generating lines lying within a quarter (or a sixth or an eighth) of the surface of the cylinder; the next series cuts through all generating lines within the adjacent quarter (or sixth or eighth) of the surface and in this way four (or six or eight) series are cut around the cylinder. The common angle between the cylinder axis and any one series of parallel laminae containing a given series of slots is alternately given an acute or an obtuse value in progressing from one series to the adjacent series around the

curved surface of the cylinder. Particular values of 45 degrees and 135 degrees are illustrated in the drawing, but it is understood that other values of these angles may be used as well. The alternating directions serve in a semi-oscillatory manner to bring the hairs to the cutting edge from both side directions as well as from the front of the edge. This pattern of construction of slots on the cylinder surface will be referred to in the claims as the herring-bone pattern.

The remaining surface of the cylinder is highly polished to slide easily over the skin. The diameter of the cylinder may be as small as is consistent with the bending strength of the material used. A small diameter is desirable to reduce unnecessary friction with that part of the skin not adjacent to the cutting edge. A diameter of about one-quarter of an inch has been found to be satisfactory. The length of the cylinder depends on the amount of clearance required by the source of power in the handle to permit convenient manipulation of the implement over the skin, and need not exceed three inches.

A guard 11 as shown in Figure 3, or other suitable arrangements may be fitted about the rotating cylinder to prevent parts of the cylinder not adjacent to the cutting edge from touching the skin and causing unnecessary friction. Holes 12 in this guard permit the cut hairs to be thrown free.

A modification of this implement consists in having two blades, one on each side of the rotating cylinder, and a reversible source of power, so that the operator may cause the hairs to be brought against either blade at will, and may place that blade against the skin for shaving. The rotating cylinder herein described will serve this double purpose.

The shaving implement described will shave surfaces bearing either long or short hairs, and will shave closely. The novel feature of the invention is the ability of the implement to shave closely, and that without the aid of lather. That type of lather-less shaving implement which employs a shearing plate, or shearing plates, cannot cut the hairs shorter than the thickness of the shearing plate. In the implement herein described the cutting takes place exactly on the surface of the skin. And whereas other types of implements employing keen blades will also cut on the skin surface, they require the use of lather to hold the hairs erect, while the latter purpose is herein accomplished by the rotating cylinder. Moreover the implement herein described offers a much better protection to the skin against accidental cutting by the sharpened edge than is found in most other shaving implements using a sharpened cutting edge. A further novelty in the herring-bone pattern of the slots on the cylinder lies in the accomplishment of an oscillatory effect through the more efficient means of a rotation.

It will also be seen that the disposition of the

slots in parallel laminae in the rotating cylinder permits of a rapid and inexpensive construction of these cylinders by multiple arrangements of saws, milling cutters, or grinding disks, and allows the use of hardened materials.

It will be understood that modifications can be made in the disposition of the cutting slots within the parallel laminae on the rotating cylinder, and also in the construction, arrangement and combination of the various parts of this shaving implement, without departing from the scope and principle of my invention.

I claim:

1. A shaving implement comprising a cutting edge to rest against the skin, a slotted cylinder rotating about its axis to bring the hairs against the cutting edge, where they are severed, the slots being cut in a herring-bone pattern on the surface of the cylinder and being narrow to prevent the skin from entering them and being injured at the cutting edge, with means for rotating the cylinder and for holding the cutting edge firmly against the cylinder surface.

2. A shaving instrument comprising a very thin shearing plate to rest against the skin, a slotted cylinder rotating about its axis to bring the hairs against the cutting edge, where they are severed, the slots being cut in the cylinder surface so that all parts of any finite length of one slot lie in a plane lamina of thickness equal to the slot width, the slot width being narrow to prevent the skin from entering and being injured at the shearing edge, with means for rotating the cylinder and for holding the shearing plate firmly against the cylinder surface.

3. A shaving instrument comprising a sharpened cutting edge to rest against the skin and to bear on a rotating slotted cylinder which brings the hairs against the cutting edge, the slots being cut in the cylinder surface so that all parts of any finite length of one slot lie in a plane lamina of thickness equal to the slot width, the slot width being narrow to prevent the skin from entering and being injured at the cutting edge, with means for rotating the cylinder and for holding the shearing plate firmly against the cylinder surface.

4. An implement for shaving, comprising a handle incorporating a source of power, a shaving head on the end of the handle to hold a blade whose sharpened cutting edge rests against the skin, a rotating cylinder attached to the source of power and bearing with its curved surface against the cutting edge, slots cut in a herring-bone pattern on the cylinder surface, into which slots the hairs may project to be brought by the rotation against the cutting edge where they are severed, the slots being narrow to prevent the skin from entering and being injured at the cutting edge, and a guard device on the head to surround the cylinder except in immediate proximity to the cutting edge.

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