Oct. 13, 1942. G. DALKOWITZ 2,298,873

PILE WIRE

Filed July 16, 1941

Fig. 1.

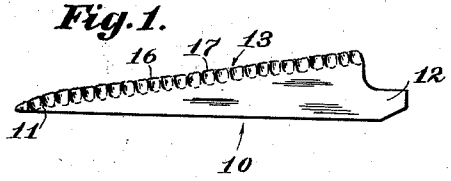
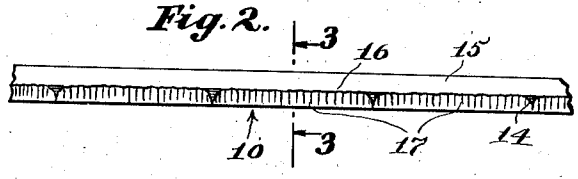


Fig. 2.



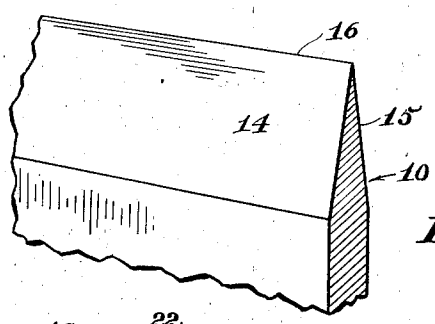


Fig. 4.

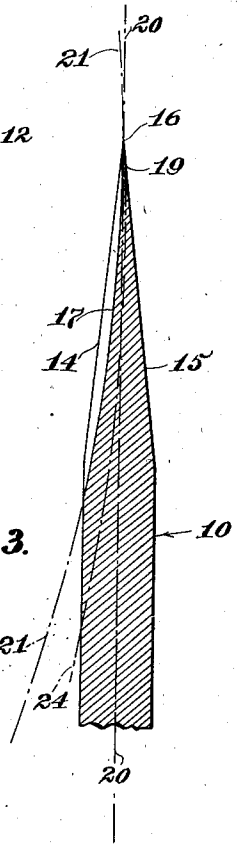


Fig. 3.

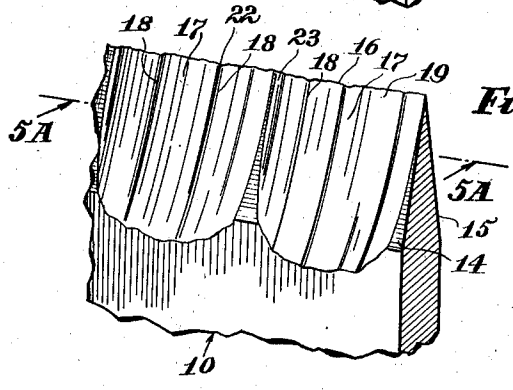


Fig. 5.

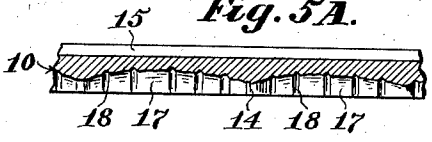


Fig. 5A.

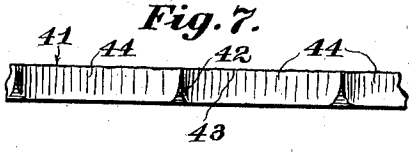


Fig. 7.

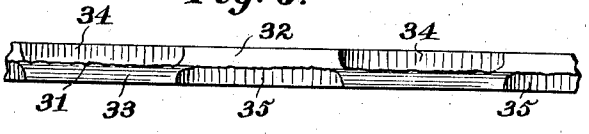


Fig. 6.

INVENTOR.
Godfrey Dalkowitz
BY
ATTORNEYS

Patented Oct. 13, 1942

2,298,873

UNITED STATES PATENT OFFICE

2,298,873

PILE WIRE

Godfrey Dalkowitz, New York, N. Y., assignor to American Safety Razor Corporation, Brooklyn, N. Y., a corporation of Virginia

Application July 16, 1941, Serial No. 402,641

1 Claim. (Cl. 139—44)

This invention relates generally to pile wires and more particularly to a replaceable blade or cutting edge therefor. The general object of the invention is the provision for a pile wire of a blade which cuts more effectively and provides greater durability for the cutting edge.

These objects and such other objects as will hereinafter appear or be pointed out are attained in the illustrative embodiments of the invention shown in the drawing, in which:

Figure 1 is an elevational view on an enlarged scale of a pile wire blade constructed in accordance with the principles of the invention;

Figure 2 is a plan view on a still further enlarged scale, of a portion of the pile wire blade of Figure 1;

Figure 3 is a fragmentary sectional view on a further enlarged scale taken substantially on the line 3—3 of Figure 2, looking in the direction of the arrows;

Figures 4 and 5 are fragmentary perspective views illustrating steps in the method phase of the invention, the showing being more or less diagrammatic;

Figure 5A is a sectional view taken substantially on the line 5A—5A of Figure 5, looking in the direction of the arrows; and

Figures 6 and 7 are respectively plan views similar to Figure 2 of other embodiments of the invention.

Before proceeding to a detailed description of the various embodiments of the invention disclosed in the drawing, it may be premised that in its essence the invention contemplates a knife edge, that is to say a wedge formation, thinned down at intervals to a feather edge, which alternate along the knife edge with relatively thick portions to give what may be described as a "hill and dale" construction without however breaking the continuity of the knife edge or forming notches or serrations therein.

The effectiveness of this construction is further enhanced by forming the thinned portions by a grinding operation which may be described as a scoring or excoriating operation, using a relatively coarse abrasive wheel. This results in hollow ground thin portions having on the surfaces thereof minute grooves traversing the cutting edge, so as to form minute notches therein however of such microscopic size so as not to substantially interrupt the continuity of the cutting edge which can be characterized as rough rather than serrated.

The advantages of this construction will be understood by a comparison thereof with a serrated knife edge construction, such as disclosed for example in United States Letters Patent No. 2,112,271. It has been found in attempting to use such serrated blades, particularly on coarse woolen threads, that threads are missed entirely and remain uncut and threads catch occasionally in the notches between the teeth and are dragged along by the pile wire. It has further been found that breakage of teeth is frequent because it is impossible by available manufacturing processes to make teeth that are sufficiently strong for practical purposes.

These defects are avoided in the present invention in which the knife edge may be described as a "shaded" toothed construction, or a serrated construction in which the serrations are "shaded" or protected by the intermediate web or feather edge portions. The latter, on the other hand, which would be to weak to stand by themselves, are given the necessary support by the thicker portions corresponding to the teeth of a serrated edge.

The great gain in the life of the blade due to this improved construction will be apparent.

It will further be observed that the knife edge is self-renewing. This is due to the fact that wear will occur practically only at the sides of the thickened portions, which will therefore be worn down to feather-edge thinness, while the feather edge portions will be reduced by breakage of portions intermediate the grooves thereof, hereinabove described, but the effect of such breakage is to form sharp edges along such groove portions as are exposed by the breakage.

Referring now to the drawing in detail, I have shown at 10 a pile wire blade of generally triangular shape, tapering to its forward end 11 and having a lug 12 at its rear end adapted to engage a recess in the pile wire and serving to anchor the rear end of the blade so as to prevent movement thereof relatively to or out of the pile wire.

The cutting edge of the blade is shown at 13. When the blade is mounted in the pile wire this cutting edge is upwardly and rearwardly inclined relatively to the direction of movement of the pile wire on its cutting stroke. This being the conventional arrangement, no further description is necessary.

The cutting edge 16 (its actual length in the specimen from which the drawing was made is about 1⅜''), is shown on an enlarged scale in Figure 2 in plan, and in Figure 3 in section. According to one manner of practicing my invention this cutting edge formed by grinding a bevel 14 on one side of a flat blank and a bevel 15

on the other side thereof so as to form a knife edge 16. A series of shallow grooves 17 are next ground on one beveled surface 15. For this purpose a row of coarse grinding wheels of small radius may be used having their axis parallel to the knife edge and the depth of cut is regulated so that they cut inwardly up to the knife edge 16, but not beyond it. The term "up to the knife edge," however, is not intended in a mathematical sense, because the transverse contour of the wheels lacks mathematical straightness or flatness, and further by reason of the coarseness of the wheels, some abrasive particles will protrude further from the face of the wheel than others. The result of applying these wheels is therefore a series of valleys. The ground surfaces however are not smooth, since the coarseness of the wheels will form a series of minute parallel grooves 18 running in a direction transversely to the cutting edge and resulting in a roughening of the knife edge.

The wheels are further so positioned that at the knife edge 16 the material of the blade is left so thin as to form what may be termed a "feather edge" 19. This effect can be obtained by positioning the wheels tangentially to the median vertical plane 20—20 (see Figure 3) passing through the knife edge 16, the point of tangency being at the knife edge. This position of the grinding wheel has been indicated by the dot and dash line 21 in Figure 3.

The result of this grinding operation is shown in perspective in Figure 5. While it will be observed that the knife edge 16 is substantially continuous, it is irregular because here and there minute notches 22 will be formed therein by reason of the aforementioned grooves 18. The result is a roughness of the feather edge portion 19 of the knife edge, rather than a serrated edge which breaks the continuity of the knife edge.

As can be seen in Figures 2 and 5, the valleys 17 are contiguous to each other, but by reason of the rounding off of the sides of the grinding wheels the thinned portions resulting from the grooving operation alternate with thicker portions 23 intermediate these thinned portions.

The result in the operation of the device is that as the blade 10 is drawn across a pile thread the wear on the knife edge, will be taken up by the thicker portions 23 of the knife edge which are positioned intermediate the feather edges, which latter, being more yieldable, are less affected by wear. The result is a gradual wearing away of the thickened portions 23 to a feather edge portions 19 act as a shield or guard to prevent the formation of teeth or serrations corresponding to the thickened portions 23, which teeth would soon have their advancing edges blunted by the impact of the pile threads thereon. Instead the wear is at the side of the thickened portions, which as the wear proceeds always retain their sharpness. It will therefore be understood that the knife edge structure described is self-sharpening in use.

While the grinding wheels have been described in the illustrative embodiment in their final position as substantially tangent to the median vertical plane at the knife edge 16 and as shown in Figure 3 which has been found highly satisfactory for ordinary purposes, it is to be observed that if a greater degree of thinness is desired, the wheel may be allowed to cut deeper than shown in Figure 3 without however cutting beyond the edge 16; for example, it may assume a position such as indicated by the dot and dash line 24, which passes through the point 16, but not beyond it laterally nor beyond the beveled surface 15, although it cuts beyond the median line 20—20.

A second embodiment of the invention is shown in Figure 6. A knife edge 31 is formed by forming a beveled surface 32 on one side of a blank and a beveled surface 33 on the other side of the blank. Grooves or valleys 34, similar to the grooves or valleys 17 are then ground in alternation first on one side of the blade and then on the other.

A third form of the invention is shown in Figure 7. In this form one side 41 of the blade is left flat, while the other side is beveled, as at 42 so as to form a knife edge 43. Shallow grooves or valleys 44 are then formed.

Both of these embodiments function substantially like the first embodiment and no further description is therefore necessary.

While grinding operations have been mentioned as used in the manufacture of pile wires according to this invention, it will be understood of course that, while such grinding operations afford a convenient manner of attaining certain structural formations, that the practice of the invention also contemplates the use of other operations and processes whereby the desired result can be thereby obtained.

While several illustrative embodiments of the invention and an illustrative manner of practicing the invention have been described herein, it will be understood that the invention can be embodied in many other forms without departing from the spirit thereof, as will be obvious to those skilled in the art, and that the disclosure herein is by way of illustration merely and is not to be interpreted in a limiting sense and that I do not limit myself other than as called for by the prior art.

Having thus described my invention and illustrated it use, what I claim as new and desire to secure by Letters Patent is:

A pile wire blade having a bevelled edge defined by two angularly related surfaces intersecting to form the cutting edge, one of said surfaces being grooved at spaced intervals along its length and transversely of said cutting edge to provide portions of reduced thickness separated by ridges in alternation therewith lengthwise of the bevelled edge said portions being each thinned down at the cutting edge to a feather edge, the portions of reduced thickness being closely contiguous at the cutting edge so that the outermost edges of said thinned out portions form a continuous and uninterrupted cutting edge running lengthwise of the blade, and is comprised substantially for its full length of these feather edges.

GODFREY DALKOWITZ.